Presentations

An Open Architecture for RESTful Geospatial Web Services

Author: Geoff Zeiss
Abstract: One of critical challenges facing many organizations around the world is that of interoperability, integrating islands of technology that characterize most IT organizations. For example, organizations with an engineering focus typically have islands of technology such as CAD, mobile, GIS, and tabular financial and business systems, many of which are proprietary, often legacy, developed by different vendors, and which are incompatible in various ways with each other. Repeatable design architectures for addressing common problems have been developed through experience, but these remain proprietary or undocumented. We propose the concept of open design architectures that would be openly available and for which there would be an open source reference implementation. We outline an open architectures based on REST (Representational State Transfer) that provides geospatial data web services. As an example, we describe a RESTful implementation, developed by Haris Kurtagic, of the Feature Data Object Application Programming Interface (FDO API) project of the Open Source Geospatial Foundation(OSGEO) ,which exposes a full geospatial web services data API for creating, editing and querying geospatial data.
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Integration of Grid Service and Web Processing Service

Author: Gao Ang
Abstract: Web Processing Service (WPS) provide a set of GIS functionality to clients via HTTP or SOAP request, including access to pre-programmed calculations for spatial analysis on vector or raster data. On the other hand, grid computing provides a service for distributed computing and data storage capacity. Combination of processing service with grid computing will make an effective solution to large scale geospatial data storage and processing. Especially on geospatial data services such as data access, data consistency and integration. This presentation will cover the concept of basic features of grid technology and OGC processing service, Grid processing architecture blueprint and case study of our prototype system. Method of upgrading traditional web processing service to grid service in Globus container will be given in this presentation. Besides, brief introductions of OSGeo China and its activities will be given at the end of the presentation.
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The Use of Free and Open Source Software for Spatial Data Catalog in Indonesia

Author: Gatot Pramono
Abstract: The abundance of spatial data which has been acquired by Bakosurtanal, a survey and mapping agency in Indonesia, needs to be effectively managed. A spatial data catalog is essential for fast data searching and retrieval. A web-based system was already developed using open source packages such as Chameleon, MapServer and MySQL. This inexpensive configuration helps reducing the total budget to develop the system. In this catalog, the search of spatial data can be performed on the basis of map sheet, administrative area and theme. The metadata is also stored along with the spatial data. Users are allowed to view the data using a web GIS interface. The system has been adopted to manage spatial database in 15 provinces and a part of National Data Infrastructure. It is found that this system is a feasible approach to manage and display the spatial data to users in the internet.
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Central Server for ‘Welstand’-policy

Author: Leon van Berlo
Abstract: ‘Welstand’ is the government commission overseeing the ‘visual decency’ of buildings in the Netherlands. The Welstand-commission reviews new building plans against the policy of the municipality. The policy of each municipality is written down in a document that is called ‘Welstandsnota’. The welstandnotas from different municipalities are all structured in a different way. The need for a (central) system that enables access to the data in a uniform approach arose. For this reason the project ‘Central Server for Welstandpolicy’ is started. The goal of the project was to develop a central server that contains structured data of all the different Welstandnotas in the Netherlands. All the data is structured according to a newly developed open standard: Information Model for Welstand (IMWE). The whole project only made use of open source software. All the results of the project are also open source. This presentation describes the process and the software-components that are used in the project. The presentation can be used as a guide to develop GIS systems using ónly open source tools.
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GIS in Banking

Author: Paul Zulu
Abstract: GIS in Banking Abstract Title: Location Planning for ATMs Using GIS in Helsinki. Aim: The main aim would be to identify best suitable locations in Helsinki where ATM could be set up. The study would also analyse the present ATMs and make recommendations as to which ones could be closed and which ones could be maintained. Background GIS is currently being used by Banks to service their client efficiently by seeing people for what they are: as valuable assets with needs, demands, and preferences. GIS has helped many Banks succeed by providing better customer services (ATMs) GIS solutions help banks keep their best clients, reach them in a more effective and appropriate way, and find more like them. In this highly competitive business environment, banks need every advantage they can get. A thorough knowledge of customers' needs and requirements gained from GIS analysis underlies the geographic advantage In general Marketing is all about Demand(Customers) and supply(ATMs).These factors are easy to pinpoint to a geographical location.And it would be interesting to see how these factors could be analysed with the help of GIS Location Planning New ATM Location Business expansion planning needs modeling location-relevant data and providing fast and cost- effective site analysis to confidently and reliably select a new ATM location. It is also necessary to assess the likely performance of new ATMs based on the presence of key decision variables, such as Concentration of commercial areas, traffic patterns, workplaces, Universities, Schools, Night clubs, Metro Stations, Supermarkets, sports centers, shopping malls or Residential areas of customers whose demographics and purchase behavior match a bank's target customer profile. GIS based solution helps to understand how a potential new ATM would perform based on the performance of a bank's best matching existing ATMs as well as compare how one of its ATM is performing relative to other ATMs. Banks seeking sites for location for expansion, also need information from local authorities about land costs, building availability and suitability, construction costs, local and state taxes, local and state development incentives, availability and cost of energy, as well as such factors as the location other ATMs from competitors, the availability of other infrastructure such as telecommunications, Electricity lines and Security of the selected site. Results Using GIS, the above mentioned factors will be easily identified and integrated. And the results will be presented in form of a map and a model which will show interested parties why the selected sites meet specified requirements. The Study will also determine the maximum number of ATMs a region is likely capable of supporting. This will also show how banks can make use of GIS to identify the best performing ATMs. References [¥] www.eseri.com [¥] Bank incentives, contract design and bank runs- David Andolfattoa, and Ed Nosalc [¥] Bank branch closures in New Zealand-Philip S. Morrison and Rachel O'Brien [¥] www.standardbank.co.za [¥] www.barclays.com/africa [¥] www. Ytv.fi [¥] www.atmmachine.com [¥] www.gisdevelopment.net Paul Zulu 11th of May 2009 Helsinki,Finland
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CHARACTERISATION OF TSUNAMI AFFECTED AREAS USING REMOTE SENSING AND GIS

Author: kannadasan.B
Abstract: The massive 2004 Indian Ocean Tsunami caused vast devastation along the coastal areas in countries around the Indian Ocean rim. As a matter of fact, tsunamis attack coastal areas and wash away vegetation exposing soil with increased moisture content due to inundation along the coastal line. Identification of tsunami –inundated areas can be performed through the changes in spectral indices which are related to vegetation, soil and water. In this project, an attempt is being made to assess the tsunami-affected areas in the coastal stretch of Chennai through IRS-P6 LISS III for pre event and SPOT-5 for post event data obtained before and after the December 2004 tsunami. The normalized difference vegetation, soil and water indices, generated from the pre and post- tsunami remote sensing data with thresholds, get as indicators to detect the tsunami affected areas. Since, landforms is a significant factor to determine the extent of tsunami run up, topographic feature extracted from SRTM will be used to assess the relationship with tsunami affected areas in GIS environment.
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Road Traffic Accident Analysis Using GIS and Data Mining

Author: tafireyi
Abstract: Abstract The problem of deaths and injury due to road traffic accident is now an acknowledged national problem if not regional or global problem. Patterns involved in traffic accidents could be detected if we develop accurate prediction models capable of automatic classification of type of injury severity of several traffic accidents. The work involves developing open source software that will use GIS, data mining, machine learning, statistical models for predicting accident occurrence, and historical data. A scientific approach is essential in formulating remedial measures and analyzing the problem. We may invest large sums of money with little or no results while relatively inexpensive measures in the right place at the right time will be extremely effective in reducing accidents. The software will not

change human behavior rather applying a scientific approach to model road accidents can enable us to study the characteristics of driver', pedestrian behavior, roadway condition, environmental conditions and weather condition that are casually connected with injury severity. This can enable decision makers to formulate better traffic safety control policies. We can also investigate risk based premiums paid by motor vehicle owners or premium based on other metric that is based on some risk measure. The traveling salesman problem looks at the shortest distance this may not be the safest we may be interested in finding a mathematically optimum solution i.e. One that is both safe, short (in terms of both distance and time). We propose to use java(cross platform), Netbeans, OpenJump, postgresql,postgis, Weka, BIRT and apache libraries in the development of the Road accident Analysis Software. By using statistics data and data mining we gain an in depth knowledge of the relationships between the physical characteristics of the location of accident, road condition, weather condition and vehicle properties. Weka will enable us to discover clusters, and associations within our accident data. Clusters can be used to determine accident black spots

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Integrating OpenStreetMap, satellite imagery, and custom maps into Wikipedia

Author: Katie Filbert

Abstract: Wikipedia has an initiative underway to integrate OpenStreetMap into wiki pages. A prototype infrastructure is being setup with support of Wikimedia Deutschland, with the goal to have deployment on Wikipedia projects by late summer (2009). Implementation involves mirroring an independent copy of the planet.osm data on Wikimedia servers, rendering and tile caching, integration into wiki pages via a MediaWiki extension, and caching images on squid servers for efficiency purposes. The map extension will also provide graceful degradation for users with older browsers or who have JavaScript disabled. With the infrastructure in place, it paves the way for future innovative uses of maps beyond just OpenStreetMap. Such features include a map layer of geocoded Wikipedia pages, adding satellite imagery from NASA WorldWind, and custom map types generated with Web Map Services (WMS) such as interactive, statistical (choropleth) maps, and allow Wikipedians to easily add maps showing things like bird migration paths. (Detailed submission and project team: http://firststrike.net/osmproject.pdf; http://meta.wikimedia.org/wiki/OpenStreetMap)

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Developing the implementing interface for agricultural decision support system using MapWinGIS

Author: Yong Li

Abstract: An agricultural decision support system (ADSS) for a mono maize cropping in western China is developed to allow users to graphically demonstrate the BMPs proposed by WNMM for specific soil types, with considerations of crop production, resources use efficiency and economic profit. It consists of three source databases (attributes of soil types, proposed agricultural scenarios and evaluation indices of the proposed agricultural scenarios), two spatial databases (soil type and village administration), and a GIS display interface with the deployment of the MapWinGIS. With this system, users can load an ADSS project file to display a colour soil type map and a transparent village boundary map labelling with the village names. The interested area can be located by using any of the following tools: Find, Full Extent, Zoom In, Zoom Out, or Pan. Once the Identify button is pressed, any mouse left-click on the soil type map may prompt an “Identifying BMPs” window displaying the recommended BMPs for the selected soil type, which are in two tables (N fertilisers and irrigation) and several evaluation charts. Users may also use this interface to find out the recommended BMPs under their own specification.

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Portable Wiki Map Server and Real Time Enivornmental MySQL GIS Server

Author: Stacey D. Lyle

Abstract: The Conrad Blucher Institute for Surveying and Science is responsible for collecting real-time weather data in the Gulf of Mexico for the National Ocean and Atmospheric Administration (NOAA). The data collection and distribution is conducted using open sources software that deposits the data into a MySQL and in ported over to multiple opensource platforms. NASA requested a portable server solution that can run a GIS server and have access to the historical data set at anytime for dynamic charting and mapping. OpenLayers, MapServer, KML, MySQL, PHP, Perl, Apache, and other models were utilized to build the system called GulfStorm. This research will share the open source software and solution developed for NASA and NOAA.

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Maptivism: GIS for the People!

Author: Jim Craner
Abstract: From Snow's cholera map of 19th Century London to user-generated maps showing the real-time spread of North American flu in 2009, cartography has long played an important role in helping our societies understand the challenges we face – and the assets at our disposal. Geospatial software has come to the masses: individuals and communities now have access to a wealth of data and tools previously available only to corporations, academia, and governments. Participatory GIS enables community members to share their stories, relate to their homes and communities, and provides invaluable data from the “bottom-up.” The philosophies of open source, open standards, and open data enable these tools – and unprecedented amounts of data – to spread rapidly, resulting in “mashups” more valuable than their component parts. This presentation will explore innovative applications of participatory and analytical GIS tools by organizations working for positive social change in communities around the world.
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MapTiler: map publishing a la Google Maps

Author: Klokan Petr Pridal
Abstract: MapTiler is a new easy to use open-source desktop application for online map publishing. It runs on Windows, Mac and Linux and is fully scriptable thanks to a command-line interface of GDAL2Tiles utility. MapTiler can be used to convert your map into a tile overlay of online maps like Google Maps, Yahoo Maps, Microsoft VirtualEarth or OpenStreetMap or a 3D overlay for Google Earth. The only thing you have to do for publishing the maps is to upload the automatically generated directory with tiles onto your webserver. MapTiler also generates simple JavaScript viewers based on OpenLayers and on Google Maps API. Supported formats of input raster files for conversion are TIFF/GeoTIFF, MrSID, ECW, JPEG2000, Erdas HFA, NOAA BSB, JPEG and more. Typical input raster data are aerial images, scanned paper maps, signal coverage maps, maps rendered with custom design from GIS or digital elevation model data. The presentation contains practical use cases and shows examples of the maps rendered with MapTiler/GDAL2Tiles. Experiences from parallelized rendering on a cluster (Amazon EC2) and from tile hosting at CDNs like Amazon S3/CloudFront, or Google App Engine are discussed as well. MapTiler is a graphical interface for GDAL2Tiles utility, which is part of GDAL (OSGeo project). More info about MapTiler: http://www.maptiler.org/
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Building Custom GIS Applications using Open-Source Toolkits – A Case Study

Author: Dr. Daniel B. Koch
Abstract: There are an increasing number of choices today when it comes to GIS platforms. Some are offered by mature companies such as ESRI while others, like Google Earth, are relative newcomers. Both proprietary and open-source solutions are available for standalone, web-based, and mobile applications. The motivation for developing a custom GIS from scratch comes from a consideration of project needs and constraints. Free, open-source software tools were used exclusively to implement the ORNL Geospatial Viewer (OGV) for three recent projects. This was a conscious decision to ensure longevity, cross-platform compatibility, and to simplify end-user license and cost considerations. The implementation language used was Python, a rapid application development language, which is similar to Java in that it uses (compiled) byte code and an interpreter or run-time engine. A graphical user interface toolkit called wxWidgets was used, which unlike Java, preserves the look and feel of the underlying native operating system. OGV has been tested under Windows XP and Vista, Mac OS X, and Linux. A GIS-centric database engine is provided by PostgreSQL. Data come from open sources as well, primarily NASA and the USGS. Data interchange with other GIS platforms is accomplished through various open file formats like KML. The following paper presents a case study using Python and wxWidgets to develop a custom geospatial viewer application with lessons learned and advice to others wishing to develop similar applications.
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Building Human Sensor Webs with 52° North SWE Implementations

Author: Jürrens, Bröring, Everding, Jirka, Stasch
Abstract: In the last years several applications based on the Sensor Web idea of integrating data collected by sensors have been successfully deployed. Typical use cases can be found in the domains of environmental monitoring or the supervision of technical parameters. At the same time, mobile communication technology has spread widely so that large parts of the population are connected to the internet or are at least able to send SMS messages. The widespread usage of mobile communication technology in combination with the Sensor Web concepts offers an interesting perspective to create even more powerful monitoring systems that integrate humans as sensors. This means that humans may report relevant observations which can be integrated into SWE based systems. In our presentation we will introduce a project for UN-Habitat which will make use of the “Human Sensor Web” idea for building a monitoring system to improve the water supply in Zanzibar.
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Proj4js - Coordinate System Transformations in the Browser

Author: Michael Adair
Abstract: Proj4js [1] is a JavaScript API to transform point coordinates from one coordinate system to another, including datum transformations. Enabling these transformations in the browser allows geographic data stored in different projections to be combined in browser-based web mapping applications. The library is a port of both the Proj.4 [2] and GCTPC [3] C libraries to JavaScript. Proj4js is one of the member projects in the OSGeo MetaCRS working group to address coordinate reference systems issues. The presentation will show an overview of the library, how to install and configure it and several live demonstrations of its use in applications. [1] http://proj4js.org/ [2] http://proj.maptools.org/ [3] http://edcftp.cr.usgs.gov/pub/software/gctpc/
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Web Mapping with Fusion

Author: Michael Adair
Abstract: Fusion is a web-mapping application development framework. It allows web developers to build rich interactive mapping applications quickly and easily. Using widgets, developers are able to add, remove, or modify functionality using standard-compliant HTML and CSS. Fusion does not require any proprietary browser plug-ins and works in all the major browsers on Windows, Mac, and Linux. Fusion initially provides support for MapGuide Open Source and MapServer web mapping architectures, but it incorporates the OpenLayers client API so Fusion can be extended to use any server technology supported by OpenLayers. This presentation will provide a high-level overview of the technology and some example applications, as well as the basics for developers to get started using the Fusion.
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Developing SWE Client Applications with the 52°North OX-Framework

Author: Arne Bröring, Simon Jirka
Abstract: The development of client applications for OGC Web Services requires the implementation of connectors to interact with the service interface. Those service interfaces are standardized so that they can be accessed in a common way by multiple clients. Due to this fact, the open source initiative 52°North started the development of the OX-Framework – a software framework which encapsulates and eases the utilization of OGC Web Services. This OX-Framework has gained maturity in the past years and has been used as the basis for various Sensor Web applications. This presentation gives a brief overview of the OX-Framework's architecture. Subsequently, examples of open source SWE applications built on top of it are presented. Those examples include a browser-based client for the visualization of time series graphs, a Google Maps based client for the display of sensor data in its geospatial context and a uDig extension for accessing Sensor Web services.
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The GENESIS Sensor Discovery Framework

Author: Simon Jirka
Abstract: This presentation introduces an open source solution, developed within the EU funded research project GENESIS, for enabling the discovery of sensors, sensor data and sensor related web services within the OGC Sensor Web Enablement (SWE) framework. Compared to web services like the OGC Web Map Service or the Web Feature Service the SWE framework requires specialized solutions that are capable of handling the dynamicity of sensor networks, the specific metadata formats as well as the SWE service interfaces for automatically harvesting metadata. For building the SWE discovery solution two open source components are combined: the 52° North Sensor Instance Registry (SIR) and the Buddata ebXML Registry/Repository. The idea is to use an approach consisting of two-layers: Whereas the 52° North SIR is allows handling the special requirements of sensor networks, the ebXML registry will allow providing an OGC Catalogue compliant discovery interface that relies on an ebRIM based metadata model.
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Using GeoDjango and libkml to Visualize 4-D Atmospheric CO2 Monitoring Data

Author: Tyler Erickson
Abstract: Atmospheric concentrations of CO2 have increased dramatically in the last century, contributing to global climate change. Carbon cycle scientists are trying to understand why plants and oceans are taking up as much carbon

as they currently do, so that they can better predict how these carbon sinks will change in the future. One important way in which scientists gain this understanding is by using atmospheric CO2 concentration measurements, together with information about wind and weather patterns from atmospheric models, to estimate what regions of the earth may have contributed to the measured CO2 concentrations and when and where the exchange of CO2 between of the earth's surface and the atmosphere may have taken place. Once this information has been collected from multiple locations, probabilistic estimates of CO2 surface-atmosphere flux as a function of space and time can be estimated from inversion models. To model the atmospheric carbon cycle, scientists must work with large volumes of data that vary in 3-D space and time. For example, to estimate the sensitivity of a single CO2 concentration measurement to surface fluxes, the 3-D positions of hundreds of particles will be simulated back in time (for example: 10 day back-trajectories at 1 hour intervals). Two temporal attributes are relevant for the analysis: both the time for which the particle position is estimated, and the time at which the CO2 concentration is sampled. Managing the this type of complex spatial-temporal data and conveying it to a user is challenging. This paper will present a prototype data system based on GeoDjango, PostGIS, and libkml that manages CO2 monitoring observations and atmospheric trajectory model results to produce complex KML representations of the 4-D datasets. These output KML datasets can be interactively visualized by a wide community of users within modern virtual globe software packages. An output of this data system was selected as a winner of Google's 2009 KML in Research Competition.

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Orfeo Toolbox: from satellite images to geographic information

Author: Emmanuel Christophe

Abstract: Orfeo Toolbox (OTB) started in 2006 as an initiative by the French space agency (CNES) to provide satellite image users with the necessary tools to efficiently extract the information available. OTB was made available as a free software under a CeCILL license (GPL-compatible). The participation and usage has been growing steadily in the remote sensing community. OTB combines several open source projects from the OSGeo community (GDAL/OGR, Ossim) with strong image processing capabilities of which many are inherited from ITK (medical image processing library). Recently, OTB has been moving closer to GIS capabilities with the support for vector data, and an advanced projection system which enables to project vector data on the fly on raw satellite images. The talk will briefly present the capabilities of the Orfeo Toolbox and the underlying computing architecture (multi-threading and streaming) and will focus more on the combination of map information and satellite images to help with the image interpretation.

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Enhancing the “P” in Participatory-GIS projects through the use of FOSS4G tools

Author: Marc M. Delgado

Abstract: Current natural resource management projects in developing countries have increasingly focused on promoting community participation in its life cycle. Participatory GIS (PGIS) advocates the participation of local stakeholders to generate, analyze and communicate spatial information in managing the environment. However, the prevailing use of commercial softwares in PGIS projects restrains its participatory nature especially when the high cost of software licenses prevents the community’s continuous use after financial support for the project ends. Using examples from an on-going community-based PGIS project in the Philippines, this paper will review and present how the use of various FOSS4G tools in different stages of the project enhances local participation, not only during data collection and validation, but also during the development and management of geodatabases. We conclude that conducting participatory trainings on FOSS4G and iterative consultation dialogues promote spatial learning as well as ensure genuine local custodianship and ownership of the PGIS project.

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Engaging NGOs in geospatial initiatives using FOSS4G for improved development work at various scales

Author: Marc M. Delgado

Abstract: Non-government organizations (NGOs) in the Philippines are traditionally involved in development projects related to poverty alleviation, political reform and environmental conservation for more than three decades. In recent years, a growing number of NGOs have begun utilizing geospatial technologies to complement their activities. However, the lack of technical expertise and financial resources among these non-profit groups impede the widespread utilization of this useful technology. Using examples from existing projects in the Philippines, we discuss how the use of FOSS4G tools can promote the active engagement of NGOs in geospatial initiatives at various scales (community, institutional and national), specifically on water management, project targeting and poverty mapping. At each scale, we examine several issues that NGOs face when conducting geospatial projects. We conclude that engaging NGOs in using geospatial technologies for development work requires building FOSS4G skills, improving equity of access to (non-)spatial data, and obtaining sustained funding to support activities.

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Zonae Cogito - A decision support system for the real world

Author: Matthew Watts
Abstract: Marxan is the worlds most widely used systematic conservation planning software. Zonae Cogito is a user friendly decision support system for the Marxan software that incorporates MapWinGIS open source software components to eliminates the need for planners to purchase commercial GIS software to use Marxan. It features simple and robust techniques for running Marxan analyses and viewing results, automating tasks in systematic conservation planning. Example functions include: - dissect the simulated annealing process to understand key concepts - assist calibration of key parameters - mask extraneous information to simplify complex parameter setting - develop and evaluate alternative conservation planning options - compatability with the C-Plan conservation planning system Planners can accomplish tasks in reduced time compared with traditional techniques, allowing them to get on with the task of planning by simplifying data analysis.
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GeoServer application schema support: complex features for the masses

Author: Ben Caradoc-Davies
Abstract: Recent work for the AuScope Spatial Information Services Stack [1] has integrated application schema support into GeoTools and GeoServer, enabling the delivery of complex feature application schemas such as GeoScience Markup Language (GeoSciML) via GeoServer's Web Feature Service. Each complex feature type is configured using a mapping file that describes the relationship between a column in a database table or view and the corresponding value in the complex feature. A feature type can be configured to nest another feature type as a (possibly multivalued) property, by reference or by value. Separate configuration of nested feature types reduces duplication and simplifies mappings. GeoServer is simpler to configure than other open source application schema WFS implementations, and so promises complex features for the masses. [1] AuScope Ltd is funded under the National Collaborative Research Infrastructure Strategy (NCRIS), an Australian Commonwealth Government Programme.
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UWS Online GIS GeoNetwork metadata catalogue

Author: Maria Piquer-Rodriguez and Andrew Lehay
Abstract: Managing GIS data and software at a large organization can sometimes be overwhelming. A lack of inter-departmental communication can hamper the sharing of data and software that may be purchased several times. This leads to a duplication of expenditure as well as being inefficient for data storage. The University of Western Sydney (UWS) aiming to avoid such a situation and hoping to facilitate the flow of information, implemented an application for cataloguing the GIS data and software that the entity owns. Effort was made to adapt the open source GeoNetwork application to the needs of the UWS GIS users in cataloguing metadata using an online application. An internal server hosts the application that staff can access from campus computers. Being managed centrally eases the usage of the application and increases accessibility. Current user's satisfaction guarantees the successful adoption of the application. Since the application was launched the level of communication and sharing of data has improved dramatically.
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eC4GPS: a cooperative platform for the self-calibration of GPS devices

Author: Maria Antonia Brovelli
Abstract: Users have started participating actively in geographic-related projects, either by collecting new data or by adding spatial information to existing ones. The diffusion of low cost GPS sensors enables anyone to collect geographic data and share them over the Internet. Nevertheless this data is usually not validated in terms of spatial accuracy, which is one of the major limitations in its effective application. eC4GPS is an online collaborative service that allows users to self-calibrate their GPS sensors and assess their accuracy with respect to highly accurate datasets (double frequency GPS) previously stored in the system by expert users. The service involves calibration fields on which users can test their instrumentation and a website where collected data can be uploaded obtaining visualization of their data and ISO-defined accuracy indexes. eC4GPS is designed for calibrating GPS sensors, but it could be easily extended to other sensors as well.
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The Time Series Toolbox

Author: Thomas Bleier
Abstract: The Time Series Toolbox is a set of reusable software components designed for applications that have to handle time series data, with its roots in the area of sensor web applications. It includes components like a Java API for time series data, data providers for OGC Sensor Observation Services (SOS) and CSV data sources and data stores, an implementation of a time series processing language, and applications like a Cascading SOS service or data import/export tools. Parts of the toolbox are already available in the Cascading SOS project on Sourceforge (http://sourceforge.net/projects/cascadingsos/) and we are in the process of making more parts available under the GNU GPL. It is currently developed by AIT, the Austrian Instititute of Technology and includes other Open Source software like the 52° North SOS implementation. The presentation will cover an introduction to the concepts of the toolbox, a description of the components and application examples.
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OCEAN Toolkit: Incorporating Local Knowledge into Marine Spatial Planning

Author: Tim Welch
Abstract: This session highlights Ecotrust's OCEAN toolkit including the free and open source, award winning, Open OceanMap suite of tools for carrying out spatially explicit surveys of community members both over the web *and* in the field, aiding in marine planning efforts and helping reduce adverse social and economic effects on coastal communities. The original PyQGIS-based OpenOceanMap software for field-use was presented in its early stages at FOSS4G Victoria by Aaron Racicot. This session will cover the significant progress made since then including its deployment in California, Oregon and Mexico, the many lessons learned, and the enhancements made over numerous development cycles. Also covered is the expansion of the OpenOceanMap suite to support web-based spatial surveys using a GeoDjango/OpenLayers/Ext stack. Now in it's first major revision, we have a number of lessons and enhancements to share after surveying hundreds of recreational fisherman over the web, drawing shapes without supervision. We're also interested in sharing how these two solutions integrate into our larger workflow which includes proprietary GIS software, what the overall data products are, and how they can be used in decision making. http://www.ecotrust.org/ocean/ http://www.ecotrust.org/ocean/OpenOceanMap.html
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Extension to Geoserver to read ESRI Mapcaches

Author: Pär Jonsson
Abstract: Lantmäteriet, has developed an tilepyramid extension to Geoserver based on Geotools to read ESRI mapcache structure We can now pre-render maps with pretty good carthography using ESRI Mapcache tool i ArcGIS server and then serve theese maps with Geoserver using this extension.
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LocStat, a sign-based digital location system

Author: Mark Relling
Abstract: I propose a free and open source system for smartphone location using 2D barcode signs. Complements GPS in built-up and other man-made areas. Background *Most mobile phones now have a digital camera. *There exist various barcode standards around the world, including 2D barcodes. *Barcodes are designed to be read automatically by digital devices. *Barcodes typically encode a small amount of data used for identification. *Two main 2D barcode "open" standards: QR Code and DataMatrix. *These 2D barcodes are already easily read by many mobile phones. *Phone's camera takes an image of the barcode & software translates it into a short piece of digital "text" (e.g. A URL). Proposal My idea involves creating a physical sign of a 2D barcode that encodes the actual location coordinates of the sign itself (i.e. it would be self-referencing). Free software already exists for this on the internet. Sign is affixed at the physical location of the real world coordinates (e.g. longitude & latitude) and direction that are encoded in the sign itself. Software to "read" 2D barcodes already exists for most smart-phones. The software would just need to be modified slightly to interpret the encoded text coordinates as geospatial coordinates. Coordinates then be fed into a map system on the smartphone. Proposed international open standard Here is an example of text decoded from a "sign" using the standard I suggest: E.g: !,WGS84,-33.858645,151.213570,NW, 67 <CR> <LF> Exclamation indicates location data to follow. 2nd characteristic is coordinate system being used. Then latitude & longitude. Compass direction is 5th characteristic followed a checksum.
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Development of Track Log & POI Management System using Free and Open Source Software

Author: Daisuke Yoshida
Abstract: Recent advanced performance of low-cost GPS and GPS-enabled cellphone has contributed a great deal to the development of location-aware services and systems. The broadband environment has promoted collaborative projects such as OpenStreetMap or other User Generated Contents services. In this research, a web-based prototype system for GPS track log and POI management was developed to archive a collaborative framework in field survey. The main functionalities of the system can be separated by 3 parts; data collection, data management and data quality enhancement. The system supports real-time data collection for the future ubiquitous environment and also can monitor real-time GPS position. This research shows functionalities which can minimize GPS errors using DOP filtering and data quality enhancing techniques using Douglas-Packer algorithm and PgRouting. The research introduces a system that provides an interoperable framework to work with other geospatial services through open geospatial standards.
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BIMserver.org: integrating BIM and GIS

Author: Léon van Berlo
Abstract: In this presentation we introduce the ongoing development of a free and open Building Information Model server (BIMserver). The BIMserver is used to persist, maintain and manage instance models of the Industry Foundation Classes (IFC) format. By using open standards, robust existing software frameworks, best practices and workflows accepted in the broader software engineering world as the basis of our framework, we hope to gain traction within the research and development community by creating a completely open reference implementation that is free to use and extend within individual research projects and commercial applications. By providing an open and extendable architecture around a robust and performing kernel we hope to be able to encourage the integration of IFC-based model processing and Geoinformationsystems (GIS). We describe the set of features implemented so far and give an outline of a roadmap for future developments. Some of these implemented features include the import and export of CityGML and KML. Furthermore we are working on an Application Domain Extension that extents CityGML with specific IFC information (BIM). All server-side functionality described here is exposed through a web-service API which has been used to implement web-based and standalone client applications. A filtering mechanism allows the extraction of sub-models such as specific element types. We finish our presentation by laying out some of the ideas and plans for the future development of the server which include query languages, a viewer (e.g. for the visualization of differences between model versions) and the use of this BIMserver for the Dutch ‘Basisregistratie Ondergrond (BRO)’. This Central registration for all Subsurface-information (BRO) includes data on the geological structure of the soil and subsoil, underground infrastructure and use of the subsurface. The ‘as build’-information about cellars and building-foundations can be exported to CityGML (including the IFC ADE) and used as a data supplier to the BRO registration.
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CityGML extension for Building Information Modelling (BIM) and IFC

Author: Léon van Berlo
Abstract: CityGML's concept of Application Domain Extensions (ADE) offers a well-defined extension mechanism to augment the CityGML data model with application specific data. These application specific extensions are formally specified in their own ADE XML schema file and can comprise additional property elements for existing CityGML objects as well as newly defined feature types. ADEs are associated with their own XML namespace which allows for integrating ADE data into CityGML instance documents. In this presentation we introduce the latest ADE that integrates Building Information Model data (BIM) based on the open standard Industry Foundation Classes (IFC) into CityGML. We also describe some methods to translate IFC to CityGML and specifically the method that is used by the open source BIMserver (bimserver.org). By extending CityGML with this BIM/IFC specific ADE we want to add the building specific details that are needed by planners in the Architectural, Engineering and Construction industry (AEC) to CityGML. This presentation describes some example use-cases where this is appreciated. We finish our presentation by laying out some of the ideas and plans for the future use of CityGML (including the BIM/IFC specific ADE) in the AEC industry. This final part of the presentation focuses on the integration between surface information (build environment) and subsurface (geological) information.
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Introducing FDO Toolbox

Author: Jackie Ng

Abstract: FDO Toolbox is a multi-purpose geospatial tool I developed to utilise the powerful capabilities offered by the FDO (Feature Data Objects) API This presentation will introduce some of the major features of FDO Toolbox and how this tool can better help you work with geospatial data.

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A Facebook Application to Share Your Weather Data by Using Sensor Web Technologies

Author: Arne Bröring, Simon Jirka

Abstract: Nowadays, the number of sensors in our households is steadily increasing. An example for such sensor systems are amateur weather stations which already monitor the local weather at many homes. Since these stations are often equipped with PC interfaces it is just an obvious step to distribute the measured data via the WWW. This presentation demonstrates a Web portal based upon Open Source components, which enables users to register their weather station and to publish the gathered data. The portal is realized as a Facebook application. It consists of a map and a time series view enabling users to display uploaded weather data as well as metadata about the weather stations. Once a user uploads data it is provided to the public via OGC's Sensor Observation Service (SOS). So, not only the developed application but also other SOS compliant clients can access the data in a standardized way.

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RADIOMETRIC CHARACTERIZATION OF GRANITOIDS IN THE MUSOMA- MARA GREENSTONE BELT

Author: Elisante Mshiu

Abstract: The Musoma Mara Greenstone Belt (MMGB) is intruded by syn-to-post orogenic suites of granitoids which range in composition from Tonalite Trondhjemite Granodiorite (TTG) to granites. Analysis of radiometric images of K, Th, U as well as their composite themes, correlate well with the MMGB geology and enabled a clear classification of the granitoids. The radioactive K content as well as U/K ratio played a great role in successful discriminating the granitoids from other rock types. A combination of K, U and Th in the R: G: B ternary diagram, classified the granitoids into two groups: a high K, U and Th group and a high K relative to U and Th group. Comparison of the radiometric results and the local geology showed that the syn-orogenic intrusives (porphyroblastic granites, granodiorites, migmatitic granites and gneissic granodiorites) have high K content relative to U and Th, and on the other hand post-orogenic intrusives (biotite granites, leucocratic granites and microgranites) are characterized by high abundances of all the three radiometric elements K, U and Th.

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A robust, low cost, GIS enabled data capture & management system for commercial/ research vessels.

Author: Brent Wood

Abstract: In order to complete a contract for a fisheries stock assessment and oceanographic survey undertaken on a commercial trawler,a robust, spatially enabled, standalone data capture/database system was designed and implemented. Data captured included near real time meteorological and oceanographic data, as well as automatically uploaded fisheries acousic, CTD and dissolved oxygen data. In addition, trawl survey data, icluding station, catch and individual fish length/sex/weight/gonad stage data from bottom and midwater trawls were also captured and uploaded. GIS capabilities for checking & mapping the data as desired during the survey were also provided. Computers running mostly Open Source & free applications were used to implement the system.

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NICAMS: a spatialy enabled image analysis tool for photographic transect surveys.

Author: Brent Wood

Abstract: Environmental assessments are increasingly being undertaken using photographic transects as a non-damaging, non-invasive method of sampling/recording biota, habitat and biodiversity related data. A critical aspect of working with such data is capturing the information recorded in teh photographs to support further analyses. NIWA is currently developing NICAMS (NIWA Image Capture, Analysis and Management System), an application based on ImageJ and PostGIS, to record image metadata, including time, location, depth and scale of each image, as well as ony observations pertaining to the images The ability to record these data directly into a spatially enabled database faciliates

data validation, data management and further analysis of the captured observations using GIS and other statistical and modelling applications.

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A spatial and temporal analysis of New Zealand's commercial trawl and dredge data.

Author: Brent Wood

Abstract: New Zealand has an extensive dataset of commercial fishing activities. Many of these include start and finish positions for each fishing activity undertaken.This presenations describes the process undertaken to model these data by converting start/finish points to area swept polygons which are overlaid on an equal area grid encompassing teh New Zealand EEZ. This generates a gidded spatio-temporal model of benthic fishing activity which can be flexibly queried and further analysed or plotted using GIS and other statistical & modelling tools.

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Styling with SLD, or How I Learned To Stop Worrying and Love XML

Author: Mike Pumphrey

Abstract: Geospatial data has no intrinsic visualization. This may seem counterintuitive to some, as we often convolve the content of the map with the look of the map. But while the content provides the backdrop, it is the visualization of the map that determines the storyline. Some web mapping software use Styled Layer Descriptors (SLD) to style maps. SLD is an open standard that encodes map styles using XML. Often times, it is necessary/worthwhile to create SLDs from scratch using only a text editor. This talk will showcase some best practices for making beautiful maps, while bravely dipping a toe into the verbose markup ocean that is XML. Brief mention will also be given to different ways of generating SLDs automatically. This talk is from the perspective of a map lover, not a programmer or web designer.

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PostGIS and Oracle Spatial

Author: Simon Greener

Abstract: Oracle Spatial and PostGIS are two of the most mature implementations of a spatial type system for their relevant host databases. With Postgres increasing in strength, and offshoot EnterpriseDB aiming to convert businesses running Oracle to EnterpriseDB/Postgres, the question of the relative merits of each of the spatial implementations arises. This talk will attempt to provide the audience with an understanding of the relative strengths and weaknesses of the two implementations so that they can feel they have some useful information which might aid decision making for new installations or conversions.

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Validation of Satellite Image with Ground Sensor Network based on OGC Web Services Framework

Author: Sarawut Ninsawat

Abstract: The utilization of satellite remote sensing image has been widely applied and been recognized as a powerful and effective tool in monitoring state of the natural environments. However, it does not provide enough reliable data due to various physical constraints especially by the absorption and scattering of atmospheric molecules and aerosols. The MODerate resolution Imaging Spectrometer (MODIS) are designed with the ability to characterize the spatial and temporal characteristics of the global aerosol filed which are used for atmospheric correction algorithm at calibration process. However, the validation process is still necessary to improve uncertainly estimates for satellite image products. This study focus on the implementation of standard OGC Web services (OWS) framework such as WCS, WFS, WPS and SOS to develop satellite image validation system with in situ data collected over a distributed sensor network of ground validation sites. The Gridded Atmospheric product will be validated with long-term continuous observed data from Phonological Eyes Network (PEN). The success of this study will contribute to validate MODIS satellite products, and to improve the accuracy of higher level products.

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Partner Management with Geography and Open Source Software

Author: Laurent Pierre

Abstract: Prospar is a web application currently being developped at Electricité De France R&D, in partnership with Camptocamp SA. It aims at providing a geographic UI to complex relationships between our partners and their customers. Simplicity & Reusability : In order to improve robustness and reusability, we based our project on standard blocks (PostGIS, GeoServer, OpenLayers) with limited and well-defined connections between them. Geoserver produces OGC geographic webservices which are being used by OpenLayers. They can also be re-used by any OGC compliant application such as desktop GIS for instance. This supports EDF R&D policy to provide the company with geographic data by means of webservices. Look and Feel : Since the key to user acceptance for a new application is ergonomy, we took a special care for the UI design. Accordingly, we chose a well-known client library: MapFish client, exploiting ExtJS and GeoExt Librairies. Discussion : The development of Prospar's prototype brought into question the technical choices we made at the very beginning of the project, namely: the use of distinct applicative blocks loosely connected vs integrated frameworks such as MapFish or GeoDjango. These frameworks offer more versatility, but, as a drawback, are stronger coupled with a spatial database (PostGIS being the most widely used). We would like this presentation to initiate a discussion about these design options.

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Irrigation decision support based on a link between pyWPS and IDL/ENVI, accessing multi-temporal WCS

Author: Drapeau

Abstract: 1- Water shortage in semi-arid environment is an economical and social issue. Arids and semi-arids regions are characterized by high vulnerability to climatical variations. Their water resource are now hardly satisfying the demand increase guided by demographical growth, improved standard of living, and economical development. In this way, Morocco will catch up with countries like Libya or Jordania by 2020 to be in water shortage (less than 500M3/year/inh). The agricultural sector stands for 12 to 20% of the GNP, but employs half of the active population. Irrigated areas, although representing less than 20% of cultivated areas, contributes to half agricultural value added, three quarter of agricultural exportations, and a more then the third part of rural employment. 2- SAMIR: A tool developed in partnership to support irrigation decision making in semi-arid regions. Optimization of irrigation goes through a better mastering of the hydrical budget of crops, and particularly their water consumption (evapotranspiration or “ET”), retrospectively to balance the water budget as well as forecasted to support decision making. SAMIR (Satellite Monitoring of Irrigation) is software for computing spatialized estimates of ET and irrigation water budget based on the use of time series of satellite images using the FAO method at daily step. The computation of ET requires climatic data (reference ET, namely “ET0”), land cover data and crop development data (“Kc” of the FAO method). The water budget is computed by linking to the FAO model a soil module including a surface compartment accounting for soil evaporation, a root compartment accounting for crop transpiration, and a deep compartment for water storage. Rainfall data is also introduced and irrigation is either an input or estimated by the model. SAMIR has been designed as an interactive user-driven tool, developed upon IDL/ENVI (ITTVis) 3- Accessing SAMIR through the Internet. The most important thing to understand is that the basical information needed to asses the water balance is not centralized: A provider could produce satellite images (like Modis for example), other could produce meteorological datas, and one could produce its own irrigation data. In order to make a demonstration, we first lean on the developments realized on the OSR (Regional Spatial Observatory), which are mainly implementations of OGC services (WMS, WFS and WCS) as Windows Web Services, an integration tool for the database, and a 2D client based on Flex. Also, as SAMIR is still under development, we did not want to duplicate the code so we choosed to directly access the IDL/ENVI programs without further modification, so that meant to access the calculations without entering the integrated GUI. The solution was to use pyWPS and IDL on a Linux platform, in fact there is no command line option of IDL in the Windows version. In pyWPS, we retrieve the user parameters from the WPS execute request and write an XML file, we pre-process the WCS coverages, and then spawn an IDL session which execute a batch file. Batch execution prevents GUI interferences in Idl. In IDL, we parse the XML file and finally call the different calculations module specified into WPS.

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Getting A Pulse

Author: Sophia Parafina

Abstract: The market for geospatial software for both open source and closed source has been growing. Because the typical FOSS4G user does not purchase a license, it is difficult to track the number of users beyond download statistics. Furthermore, neither numbers of licenses nor download statics provide information on actual usage. One way of tracking usage is by extracting user activity from the email list server archives of software user groups and analyzing usage patterns. The presentation will document the list server activities of users for the major FOSS4G projects as well as commercial geospatial vendors. Comparisons will be made betwen FOSS4G products as well as comparisons between FOSS4G and commercial geospatial software.

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Application of open source web-GIS mapping technology to visualize the hydro-climatic data network

Author: Jae
Abstract: Open source based web-mapping platforms such as MapServer are commonly used by water scientists wanting to publish maps online. Although MapServer is well suited for interactive web-mapping, MapServer alone is not able to accomplish a set of advanced actions enhancing robust and stable interactions between servers and clients. To apply free and open source software to real-world geospatial applications, Ka-Map coupled with MapServer through the PostGIS geospatial database has been implemented to visualize the hydro-climatic data network (HCDN), which is often utilized to identify the potential impacts of climate change on regional water resources. Such visualization and customized maps are also very useful for integrating and assimilating environmental datasets into digital watersheds along with other real-time data collections, including satellite-based remote sensing and/or automated wireless data networks. All these services comply with OGC standards, and many potential applications to multi-disciplinary research activities, including public health, crop mapping, and cyber-sensing and modeling activities related to climate change impact studies, are expected.
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SoilNet SensorNetwork goes web

Author: Till Adams
Abstract: SoilNet SensorNetwork goes web subtitle: collecting, processing and presenting real-time geodata Authors: Till Adams and Marc Jansen The project run by several Helmholtz Research Centers aims to develop a soil moisture sensor network for monitoring soil water content changes at high spatial and temporal scales. terrestris has developed a web based application for processing and presenting the data collected via a wireless sensor network and several other datasources. The application allows to - interpolate data in GRASS in real-time - visualize these results in an OpenLayers based webfrontend - create movies of interpolated rasters - create graphs of various types - create various export formats - visualize sensornetwork topology
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Comparing apples and oranges: Uncovering the mystery of component selection in WebGIS projects

Author: Marc Jansen
Abstract: For various parts of WebGIS applications more than one possible software exists. Shall I use Geoserver or UMN Mapserver? Should I recommend OpenLayers, MapFish or Mapbender as a client component? Will lighthttpd be sufficient or is there the need for Apache as Webserver? Decisions have to be made and often you have to compare apples and oranges. The talk will try to uncover the various reasons in favour or against software packages and will highlight that there are usually more aspects than just hard facts. Hippness of a particular piece of software, the community around it and gut instincts of the project leader might be just as important as the license, the frequency of updates and constraints of the surrounding environment. And not every WebGIS application has the same demands. This talk is an advocacy for a diverse discourse without a premeditated outcome when facing technology decisions like those mentioned above.
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Large scale collecting and processing of vector geodata with QGIS, PostGIS and UMN Mapserver

Author: Marc Jansen
Abstract: In the past year terrestris did several major digitizing jobs using OpenSource components. We used UMN Mapserver to serve aerial images as digitizing background through a WMS, PostgreSQL with PostGIS as target database for gathered features and QGIS as desktop GIS for our digitizers. This combination of software components has been very stable and productive yet some problems did occur and needed to be solved. The talk will describe the data collection setup, the problems we faced and our solutions which lead all projects to a successful end. The talk will be about both the good and bad parts of the mentioned combination and about the lessons learned during this process.
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Using Open Source to the Ministry of Housing and Urban Development - CHILE

Author: César Medina
Abstract: The use of Open Source in the institution of the State of Chile, has been in constant development, for their strengths in internal architecture and opportunities for advancement in the use of geographic information and scalability for sustainable development. Gradually, the use of geographic and statistical information has become an effective tool to support decision making on investment and project planning in the medium term, allowing a full understanding of the territories where they are invested and the interaction with other public services in these areas. To continue this work and encourage the use of geographic information in the State are expected this year with mapping and satellite imagery for about 70% of communes in the country, representing about 90% of the population The installation software on servers, and application development has been implemented in Open Source, starting with a Linux server, PostgreSQL database with a GIS for spatial data management, Web server Apache, MapServer map server, and development of PHP pages.
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Use of cloud computing in impact assessment of climate change

Author: Kwang Soo Kim
Abstract: Climate change has a pronounced impact on natural and agricultural ecosystems. To assess the potential impact of climate change, climate change data have been used as inputs to models. Cloud computing, which provide multiple instances of operating systems in a virtual environment to do processing on demand, can be useful for those studies. Furthermore, it would be advantageous to use open source geospatial applications in order to avoid problems associated with proprietary software when cloud computing is used. In our pilot study, Amazon Web Service – EC2 (Elastic Compute Cloud) was used to calculate the number of days with rain in a given month. Daily sets of climate change data, which were about 73 Gigabytes in total, were processed using ten instances of an operating system with a customized database transaction application. The application was linked against open source geospatial libraries.
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SCENZ-Grid, The implementation of a Science Collaboration and Computation Environment

Author: Niels Hoffmann
Abstract: Landcare Research is moving from a traditional commercial based GIS Platform to a mixed envrionment with a complete Open Source stack, including PostGIS, Geoserver and OpenLayers. Landcare Research is also moving from traditional desktop based spatial analysis to distributed and Grid enabled spatial modeling using Workflows. This presentation will outline the requirements that Landcare Research has and the components used for implementation. This includes WPS, WMS and WFS services as well as a Grid computing back-end and geospatial grid middleware.
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Regiofreizeit.de - how to apply WebGIS techniques to the German Reinheitsgebot

Author: Till Adams
Abstract: The tourism portal regiofreizeit.de has been online now for the past 5 years. The collection of POI data is done in a decentralized fashion which is probably one of the keys to success. Due to the general acceptance of the portal, development is set to continue. The recipe for continued success will be new Mapfish technology cutting down on the past 'featureitis' and generally following the motto: 'Less is more'. So basically the portal will grow to be more like german beer: water, hops, no additives and you're headed for a great time with no headaches on the day after.
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There is no alternative to OpenLayers...?

Author: Till Adams
Abstract: The success story of openLayers in Germany at least extends from the FOSSGIS 2006 to FOSSGIS 2009. That leads to the questions of "What is great about openLayers and which things aren't quite the way they should or could be?" Is there any competition in sight that might enhance business? Why do other projects like Mapbuilder and Chameleon die with people getting involved in OpenLayers? If you compare it with the success stories of Mapserver and Geoserver there are quite a number of open issues. With so many questions to be answered this talk focuses on the meta-level of success the different OSS projects enjoy and discusses the advantages and draw-backs of this.
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GeoShield: a server side user permissions management to OGC services

Author: Milan Antonovic
Abstract: GeoShield is a project born to offer a centralized way to define security access-control to geo-services. It acts like a proxy, intercepting all the communications between clients and OGC compliant services (WMS, WFS, WPS, SOS). GeoShield is able to manage users and groups, it handles authentication and privileges settings among groups and registered services. It is capable to analyse requests applying the filters setted to the user and manipulating the response. For example handling WMS security, with GeoShield we can: - define access privilege for each layer provided by the service, - specify if a layer can be viewed or not, - define geometrical extent of view permission. All privileges on single layers are based on Common Query Language (CQL) filters, that allow interesting combination of permissions definition that operate in a hidden way to end-user. Technical info - The core of GeoShield is written in Java and rely on GeoTools. - The database used for storing data is PostgreSQL. - Authentication method is the "HTTP Authentication: Basic Access Authentication", that guarantee compatibilities with most of the clients (like uDig, ArcGis, Google-Earth, etc.) - Web interface build with ExtJS and OpenLayers
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goGPS: a navigation software to enhance the accuracy of low cost GPS receivers

Author: Eugenio Realini
Abstract: The addition of geographic information to the virtual content of the Internet is becoming more and more popular, as it is being recognized as the first step towards the so-called Geo Web. In this framework there is an increasing interest in using low cost GPS receivers and in the possibility of enhancing their accuracy. goGPS is a satellite navigation software exploiting networks of GPS permanent stations to apply real-time relative positioning. It is based on extended Kalman filtering techniques to model the kinematics of a roving GPS receiver and on the use of a digital terrain model to mitigate the GPS weakness in the vertical direction. The motion can be optionally constrained to a given network of paths (e.g. roads, railways). The main innovation introduced by goGPS is the application of the concept of kinematic relative positioning (RTK) to low cost single frequency GPS receivers, enhancing their accuracy from the usual 2-4 m up to some decimeters. goGPS is developed in a MATLAB environment and it is published as open source software under the GPLv3 license.
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Mapping interviews with open source technologies

Author: Chris McDowall
Abstract: Semi-structured and unstructured interviews generate large amounts of information. However, even when a session's audio is transcribed into text, this information can be difficult and time-consuming to search and analyse. This presentation describes a set of techniques for recording, storing and searching geographical aspects of qualitative interviews. This is achieved through a system consisting of an mp3 recorder, a homebrew interactive whiteboard and a custom web application built upon OpenLayers, PostGIS and the Django framework. The system provides an interactive map that remembers where and when participants touched the map during the interview. These annotations are automatically synchronized to the interview's audio file and stored in a database. The database enables people to make maps of places mentioned in particular interviews or to make geographic queries when searching within and across interviews. I demonstrate the system with reference to a New Zealand case study where Maori Kaumatua (tribal elders) were interviewed about the histories of various landscapes.
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Spatial Data Infrastructure Components as Building Blocks for Early Warning Systems

Author: Hanko Rubach
Abstract: Early warning systems should be based on a great variety of data and information sources, especially with a direct or indirect relation to space. Spatial data may include topological data sets, elevation models, satellite imagery and data collected through sensors. To provide accurate decision-supporting information, early warning systems should be capable of hiding the complexity of the underlying data sources and information models through well-known interfaces (component interfaces as well as user interfaces). Within the Earthquake Disaster Information System for the Marmara Region, Turkey (EDIM), the Open Source framework deegree provides an implementation of interfaces for data, services, and user interaction. Based on a web portal, the relevant services are demonstrated with a special emphasis on data and service interoperability.
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Visualization of Historical Streetscapes with a Web GIS

Author: Toshikazu SETO
Abstract: This study aims to visualize geo-spatial information with photos, related to historical landscapes. The study is based on “Kyo-machiya Community-building Survey,” for which the Kyoto City government, Ritsumeikan University, architects and volunteer citizens have been working together since October 2008. The purposes of this Survey are to do a complete enumeration survey of approximately 50,000 Kyo-machiya, traditional wooden townhouses as Kyoto’s representative historical architecture, and to identify streetscapes historically suitable to such architecture. A large amount of geo-spatial information and a great number of photos of Kyo-machiya and streetscapes have already been accumulated through this survey. Moreover, their GIS databases are under construction with the aid of ArcGIS and Photofield, a free spatial photo album software created by Dr. Hideyuki Fujita, the University of Tokyo University (http://www.s-it.org/photofield/). Based on these databases, we are developing the open source Web GIS with a user-friendly interface that assists landscape analyses and city planning for historical landscape preservation.
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Implementation OGC Sensor Web Enablement supporting Local Participation in Water Resource Management

Author: chaipat Nengcomma
Abstract: Geospatial web services based on OGC Web Services are well established and widely accepted at the national and international level. OGC Web Services enables organizations to interoperate geospatial systems. Nevertheless OGC Web Services harmonize with the conventional web service framework. Thai mapping community aims this technology to help tackling disaster management and climate changes. Furthermore we are applying to a research project supporting the project ‘Local Participation in Water Resource Management’. The challenge of the research is to handle real-time environment data logged from remote sensor network. The sensor system is capable of measuring, logging and transmitting the data timely over the network. The Crossbow eKo sensor system is used in the test area ‘Rayong province’. Because of the open source based product are used here and we could apply basic features of OGC Sensor Web Enablement (SWE) on top of the proprietary system. The current applications for the project ‘Local Participation in Water Resource Management’ include discovery service and service binding.
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Using Open Source Technologies to Spatially Enable Aceh

Author: Patrick Fitzgerald
Abstract: The use of spatial information in Aceh post-tsunami was driven by local practitioners and NGOs working on recovery projects, supported by the Spatial Information & Mapping Centre (SIM-Centre) based at the Bureau of Reconstruction & Rehabilitation (BRR). Initially directed to supporting recovery activities, the focus later turned to building capacity within local government agencies to spatially enable whole-of-government planning and operational support. A strategy for effectively using spatial information and technology throughout the province was developed, fundamentally based on the establishment of a Spatial Data Infrastructure (SDI). With the Provincial Government of Aceh mandating that Aceh should be, where possible, an Open Source province, this paper describes how Open Source technologies were used to implement a successful SDI solution in Aceh. It details the architecture and software used and some of the pilot applications developed. It also discusses the advantages and disadvantages of using Open Source technology and provides recommendations which are relevant to developing countries.
Rate the workshop
I have •no •slight •huge interest in attending the workshop

Linking Open-Source SpaceSyntaxMap to GRASS GIS: an experimental development

Author: Wen-Chieh (Jeffrey) Wang
Abstract: Space syntax is a set of theories and techniques for analyzing spatial configurations (Wikipedia.org). It is a popular tool in research and design of built environment where way-finding is a significant issue. Given the complexity of built environment a spatial network analysis software is usually necessary to carry out the analysis. Axman is one of the earliest such software and inspires many others. Since 2007 Nick Sheep Dalton, the respectful author of the original Axman, has created an open source implementation of Axman in Java called SpaceSyntaxMap on SouceForge.net. To end users, the main difference between SpaceSyntaxMap and Axman is the former only comes with a command line user interface. Because the SpaceSyntaxMap lacks any graphic handling capability, it must work with other graphic capable programs, especially GIS, to have any practical use. This presentation describes an experimental development that extends SpaceSyntaxMap to include the new capability of loosely coupling with a GIS. Due to its open-source origin, the choice of the target GIS is also an open source one, the GRASS GIS. Through a couple of urban analysis applications, this presentation demonstrates that combined with the input, output, and further spatial analysis capabilities

of GRASS, the open-source SpaceSyntaxMap can be a viable alternative to other proprietary spatial network analysis software.

Rate the workshop

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nWeb, a data-driven spatial modelling software

Author: Florian Mayer

Abstract: We present the software prototype nWeb, a database-driven web portal to integrate, manage and visualize heterogeneous spatial data of a research project, to simulate an agent-based model that was created from these data, to both analyze spatial data and evaluate the model statistically, and to document the project and itself using a Wiki, Javadoc and BibTeX. nWeb was developed as a Java Spring model-view-controller application prototype using the Groovy on Rails (Grails) framework. It combines multiple data sources into a common data model (model) and acts as a front end (view) to the business logic (controller) and persistence tier, a spatially enabled postgres/postGIS database. Beyond its prototype's purpose, simulating a spatial model of human usage of an Australian marine park, and being well-documented open-source software, nWeb can serve as an easy-to-use template to create a data handling and model simulation environment for other spatial modelers with moderate programming skills.

Rate the workshop

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Visualising animal movements in 'near' real time

Author: Ben Madin

Abstract: Knowledge of animal movements is vital to the control of disease spread. Both the number of movements and the volume of animals can have important ramifications on the likelihood of disease being transferred as a result of these movements. In the case of disease control programmes, it is valuable to be able to visualise this information in a map context, so that the relationship between animal movements and other significant factors for disease (animal populations, human populations etc) can be assessed rapidly. We set out to identify the animal movements occurring in Western Australia (WA) and the Greater Mekong Subregion of South East Asia (GMS) by capturing movements in a database and displaying the movements in a user queryable interface displaying the results in both map and tabular form. We needed to develop a low entry-cost solution with limited ongoing costs to provide a sustainable system, so we are using entirely open source software for our computing power (PostgreSQL / PostGIS database with an FreeBSD / Apache / PHP Data entry system and using MapServer / OpenLayers and R for outputs.)

Rate the workshop

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A 3D visualization system for coalmine based on Ogre 3D

Author: Zhiwei YU

Abstract: This paper presents a 3D coalmine visualization system based on Ogre 3D engine, in which the coalbeds and lanes are modeled through a novel approach for rendering and retrieving. For modeling coalbeds, coal floors are first segmented into blocks with collapse columns, faults and boundaries, within which the interpolation based on floor contours is further performed to obtain the floor elevation grid, and then the Triangulated Irregular Network (TIN) being filled with irregular hexahedrons are generated based on the floor elevation grid and the coalbed thickness information, and finally the level-of-detail mesh database is prepared for Ogre rendering based on the above TIN. For modeling lanes, the centerline, height and arch shape of lanes are adopted to generate the mesh model of lanes. The prototype system is developed with C++, gluing Ogre 3D engine and MFC GUI together. The current version supports not only 3D rendering but also coalbed block selection, spatial or attribute query, collision detection, and 3D scene viewing. The system is well demonstrated in this work with the geospatial datasets of the 3# coalbed and related lanes in Dayang Coalmine, Jincheng of Shanxi province, China.

Rate the workshop

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G3D Based Study on 3D Lane Modeling and its Visualization

Author: Zhiwei YU

Abstract: For implementation of 3D Visualization and browsing of lane model, this paper deals with the way of 3D modeling of coal mine lane and software development by using G3D engine. G3D(Graphics3D) is a commercial-grade 3D Engine available as Open Source. It is used in commercial games, research papers, military simulators, and university courses. G3D provides a set of routines and structures needed in almost every graphics program. It makes low-level libraries like OpenGL and sockets easier to use without limiting functionality or performance. G3D is a rock-solid, highly optimized base on which to build 3D application for Digital Mine. In this work, we elaborate the architecture of G3D and principles for implementation of its functions, in particular, its classes and data access, and analyses the key

technologies and development environment for building 3D models. Then we design the data structure and procedures for extracting the lane mid-lines and manipulating plain, and determine algorithms for 3D lane modeling. As to the visualization of 3D lanes we propose the way for projection selection, coordination conversion, scene rendering, texture mapping, collision detection and 3D browsing. To realize all of these, we compile program codes that can be integrated to G3D. Running test shows that this integrated system can effectively used for 3D visualization and browsing of lane model.

Rate the workshop

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Application of SWAT for Sediment Yield Estimation in a Mountainous Basin

Author: Xianfeng SONG

Abstract: The advanced SWAT (Soil and Water Assessment Tool) model is based on hydrologic process and needs to be calibrated and validated prior to its application. This paper presents a case study conducted in Chaohe river upstream to verify the applicability of SWAT for predicting sediment yields in a semi-arid mountainous basin, in which the parameterization of HRU is particularly carried out to reflect the impact of rugged topography on hydrologic process in comparison of the default computation methods. With the historical gauge records, the above modification was well tested in the study area. The monthly measured runoff and sediment yields at Dage guage during the period 1985-1987 was used to calibrate the model while data from 1988 to 1990 was used for model validation. The simulation results revealed that the SWAT with the above improvement could be applied in a rugged mountainous region for erosion control and watershed management.

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How to build a sustainable FOSS4G business organization

Author: Toru Mori

Abstract: Orkney, Inc. was established in 2002 as a geospatial solution consulting firm and launched FOSS4G business in 2004. Since then, it has provided nearly 100 web mapping applications using FOSS4G tools to a wide variety of customers for 5 years. It has also been one of the key supporters of OSGeo Japan chapter. However, there have not been other successful companies that are doing similar way yet in Japan, why? Is the market size too small or are there any entry barriers? This presentation tells you about how to establish such a business organization particularly in Japan, the second largest IT spending country after U.S. It also introduces you colorful customer cases that guide you to the cool and high-tech country located in the Far East.

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Geodata and CouchDB

Author: Volker Mische

Abstract: Geodata is traditionally stored in a relational database management system. But there are different approaches available, one of them is CouchDB, a document-oriented database which uses JSON as its native storage format. CouchDB offers replication and high scalability. The RESTfull HTTP API and many available language bindings eases the development. This presentation will be an introduction into CouchDB and the benefits/chances as a storage system and application server for geodata.

Rate the workshop

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Building community information systems with Drupal and OpenLayers

Author: Charles Burnett

Abstract: Coastal British Columbia indigenous communities seek solutions to their community information storage, sharing and processing challenges. They are looking for systems that provide basic GIS database, mapping and reporting functionality all in a web-based, open standards, secure, and multi-user environment. They are also keen to have these systems be very intuitive and embedded within their current web infrastructure. And, they would like these systems to serve many functions, from treaty and economic development support to language revitalization. We have developed community information systems (CIS) for several First Nations using Drupal and PostGIS. Key to these systems is the Drupal Open Layers module, which works with the Druapl Geo module to spatialize nodes (GIS features) stored in PostGIS. These nodes, such as archaeological and traditional occupancy/use sites, often have large amounts of attribute data and link to multimedia files. In this presentation we will show some of the current OpenLayers capabilities, including its ties to Drupal Geo (to interface with PostGIS), and its integration with the Drupal Views module which enables the building of unlimited custom maps within the CIS. We will then demonstrate some of the challenges/ solutions of creating large multi-user web-mapping sites that house a lot of sensitive multi-media material. And we will

discuss some of the benefits of an open standards approach in terms of building links ("referrals interconnectivity") between government and First Nations systems. We will finish with some glimpses into the future for the CIS application of Drupal/PostGIS/OpenLayers technologies, including a demonstration of fusion between our CISs and the Alfresco document management system.

Rate the workshop

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Streaming Softwood Harvesting Datastreams to Open Source

Author: Steven Cyphers

Abstract: With the advent of “bucking” and efficiency management controls installed on timber harvesting equipment, forestry organisations now have access to a rich data-stream, which can be analysed within a GIS environment. Timber, which is cultivated with machinery fitted with a geographic tracking and scanning devices, can provide a data-stream containing tree location, base elevation, height, diameter, log quality, log count, taper, height and over and under bark volumes for every tree cultivated. Python, an open source scripting language can be utilised to batch process and parse information from tens of thousands of text files into a LandXML point dataset, which can be subsequently utilised to investigate harvest yields within a coupe or across a region. The timber industry in EU is moving towards digital harvesting directives where site descriptions, stand boundaries, maps and aerial photos are provided as a digital timber harvest plan and integrated into the onboard mapping hardware and software of the four leading manufacturers of harvesting computer. I would like to see this passage of data move to an opensource form.

Rate the workshop

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Mobile Mapping for Field Data Collection

Author: Paul Wickman

Abstract: Collecting map-based data in the field without Internet access is a common requirement. However, commercial off-the-shelf solutions are largely based on proprietary hardware platforms which can be quite expensive. Non-governmental and community-based organizations often do not have adequate budgets or must seek out grant funding to purchase the equipment. These organizations would often prefer to use “general purpose” laptop computers they already own. This presentation demonstrates a mobile data collection solution originally developed to support the International Crane Foundation’s Whooping Crane and Sandhill Crane conservation efforts. Built on open source components such as MS4W, OpenLayers and PostGIS this flexible framework allows users with no programming experience to create task-specific forms and maps for entering field observation data using netbook-style computers. Upon returning to the office or entering Wi-Fi or cellular broadband range, the observations/entries are uploaded to the central Internet-based mapFeeder database. GeoServer then makes the data available to any OGC-compliant mapping application.

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A KNOWLEDGE-BASED ALGORITHM FOR GENERALIZATION OF POLYLINE FEATURES

Author: Samsung Lim

Abstract: Current map production systems provide reasonably complex tools and procedural cartographic protocols, however, cartographers’ interactions are essential for selecting information, symbolizing features, maintaining topological relationships, and visualizing graphical conflicts. Although an efficient generalization technique would improve the graphical quality and legibility of maps, existing techniques use an “ill-structured” approach because it is hard to devise an algorithm to solve the problem. On the other hand, expert systems use a collection of “rules of thumb” that are mainly heuristics methods or principles for decision making. It is an alternative solution to the aforementioned problem. This paper presents “Generalization Expert System (GES)”: a knowledge-based solution. Key steps undertaken in building GES and its components are presented. GES is developed in Java and Python for the delivery of simplified spatial data. Its capabilities are demonstrated in a case study through simplifying roads, native vegetation and elevation data to derive 1:500,000 scale from the source maps at 1:250,000 scale over Canberra, Australian Capital Territory, Australia. Although a number of advanced applications have been developed with high technical skills, GES has a simple and user-friendly GUI that can benefit users with lesser technical skills and knowledge of spatial data management

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3D Modelling of Individual Trees Using Full Waveform Lidar

Author: Samsung Lim

Abstract: For the last few decades, analysis of forest area has been conducted using remote sensing techniques such as aerial photogrammety, satellite imagery, Synthetic Aperture Radar (SAR) and lidar. Airborne laser scanning (ALS), in particular, offers a cost-effective, versatile, operationally flexible and robust sampling tool for forest management. There is a growing industry trend towards techniques of 'precision forestry' that result in precise mapping of vegetation structure with a realistic 3D modelling, including the potential application of lidar technology. The Australian government has been investing in long-term researches for development and maintenance of its forests i.e. establishment of geographical distribution of plants, classification of plantation, construction of forest Data-Base (DB) and detection of forest change. Estimation of biomass in the forest areas is gaining international attention that could be used as a potential natural resource. Using lidar technology, it is expected that an accurate estimation of the total biomass of the forests is feasible, enabling the value of forestry to be envisaged. ALS provides an indispensable tool in estimating biomass. ALS systems may be categorised into two classes: discrete-return systems and full-waveform systems, based on the method of recording return signals. The use of a lidar system in previous researches has advanced a deeper understanding of canopy surface and segmentation processes for estimating dominant above-ground biomass (DAB) in a harvested forest. However, general lidar systems using a discrete-return pulse are nevertheless insufficient to detect tree types, tree heights and canopy under storey. While the discrete-return systems only records a few reflections per transmitted pulse, the full-wave system digitizes the entire return waveform at very high sampling frequencies and hence it is able to record up to a few hundred samples per transmitted pulse. Studies have demonstrated that over 99% of all transmitted laser pulses gathered by discrete-return lidar systems record less than four reflections (echoes), regardless of density variation within the forest canopy. On the contrary, being capable of recording multiple reflections per transmitted pulse, the full-waveform systems can provide a better representation of the forest density structure compared to discrete-return systems. The main aim of this paper is to identify the characteristics of full-waveform data over vegetated terrain and extract individual tree structure and characteristics. In particular, modelling of each individual tree is constructed in 2D and 3D using the full waveform data processing. This processing involves many steps with each requiring a variety of processing algorithms: 1) waveform pulse signal processing, 2) data deconvolution, 3) georeferencing with GPS/INS data, 4) voxelizing data, and 5) data conversion to point clouds and tree modelling. An algorithm for each processing stage was created with few exceptions where commercial software has occasionally been used. The algorithms to perform each step in the procedure were developed in MATLAB v.7b. The experimental area was chosen to be 1km by 1.6km of the Centurial Park in Sydney, Australia. The full waveform data was collected on the 2nd of July 2007 using an RIEGL LMS-Q560 system by Digital Mapping Australia. The data acquired using this system gave access to a greate number of returns per shot, high multiple-target resolution. This study area was chosen as it contains a variety of different types of tree. However, we selected the small sample area and produced three different types of trees according to their sizes since the full waveform lidar data processing is a rather complicated and time-consuming task. Prior to data processing, the data firstly had to be geo-referenced and corrected. Input to the process included lidar waveform data and sensor data, containing post-processed position and orientation data for the airborne sensor, scanner angles, IMU offsets, and misalignment angles. Computation of the X, Y, Z coordinates of laser targets in the mapping frame was accomplished through the laser geo-location equation containing rotation matrix. The sensor data of waveform was divided into severe sections separated by the digitized transmitted pulse and the first 80 samples of the return corresponding to the first 80ns, next 80 samples of the return corresponding to the next 80ns and so on. Each recorded waveform sensor data was deconvolutionized using a Wiener filtering strategy to create a train of amplitude spikes in time. Each spike corresponds to an individual laser reflection, with its amplitude proportional to the amount of backscattered energy. Once processed, we created point clouds each having Easting, Northing, and Height that could then be used to represent individual trees in 3D. The results obtained from this procedure need to be validated for their accuracy. In conclusion, we managed to develop a processing method to produce very dense point clouds in full waveform data. This enables a more detailed construction of realistic 3D individual tree maps showing the geographical distribution of plants compared to discrete-return system. These results should facilitate a better management of forestry and assist in future planning. However, this full waveform nevertheless is subject to many limitations. The full process can be very time consuming and there is a need to develop an automation with a shorter processing time but a higher accuracy. Further work should focus on extended types of trees as is not done in this experiment.

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Visualization of Historical Streetscapes with a Web GIS:

Author: Toshikazu SETO

Abstract: This study aims to visualize geo-spatial information with photos, related to historical landscapes. The study is based on "Kyo-machiya Community-building Survey," for which the Kyoto City government, Ritsumeikan University, architects and volunteer citizens have been working together since October 2008. The purposes of this Survey are to do a complete enumeration survey of approximately 50,000 Kyo-machiya, traditional wooden townhouses as Kyoto's representative historical architecture, and to identify streetscapes historically suitable to such architecture. A large amount of geo-spatial information and a great number of photos of Kyo-machiya and streetscapes have already been accumulated through this survey. Moreover, their GIS databases are under construction with the aid of ArcGIS and Photofield, a free spatial photo album software created by Dr. Hideyuki Fujita, the University of Tokyo (http://www.s-it.org/photofield/). Based on these databases, we are developing the open source Web GIS with a user-friendly interface that assists landscape analyses and city planning for historical landscape preservation.

Rate the workshop

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Developing a prototype of Indoor Geo-Portal service using 3D Open Map APIs

Author: BJ Kang
Abstract: Almost Geo-Portal services provide the user with outdoor spatial information and related services. Some of these services, providing indoor spatial information, have a limitation which is providing only geometrical information of indoor space. However, large complex building and skyscraper are regarded as a mainstream of city environment and the public demands more high-quality spatial services. Therefore, Geo-Portal services have to include indoor space among in service area. New contents and services for indoor space should be developed and a prototype of Indoor Geo-Portal has to be proposed. The object of this study is proposing to the prototype of Indoor Geo-Portal, which provides the user with satellite image map, indoor spatial information and spatial services for indoor space using Google Earth APIs. The proposed prototype can be used as a guideline for developing Geo-Portal service, and it will contribute to Geo-Portal industry by providing indoor spatial services to the user.
Rate the workshop
I have •no •slight •huge interest in attending the workshop

Shortest path search for real road networks with pgRouting

Author: Anton
Abstract: This presentation will show the inside and current state of pgRouting development. It will explain the shortest path search in real road networks and how the data structure is important for getting better routing results. We will show how you can improve the quality of the search with dynamic costs and make the result look closer to the reality. We will demonstrate the way of using pgRouting together with other Open Source tools and open data. Also you will learn about difficulties and limitations of implementing routing functionality in GIS applications, the difference between algorithms and their performance. pgRouting is an extension of PostgreSQL and PostGIS. A predecessor of pgRouting - pgDijkstra, written by Sylvain Pasche from Camptocamp, was extended by Orkney (Japan) and renamed to pgRouting. pgRouting can perform: * shortest path search (3 different algorithms) * Traveling Salesperson Problem solution (TSP) * driving distance geometry calculation
Rate the workshop
I have •no •slight •huge interest in attending the workshop

Geocoder.US, redux

Author: Schuyler Erle
Abstract: In 2004, we introduced Geocoder.US, which we believe to have been the first bona-fide Open Source address geocoder for the United States. Since then, the project has been widely used to provide geocoding for US street addresses, using the original form of the Census Bureau's TIGER/Line data set. This year, we are proud to announce the release of Geocoder.US 2.0, written in Ruby, to provide even more robust address parsing and geocoding. Although the project was designed with the new Shapefile version of TIGER/Line in mind, the use of SQLite as the data store has permitted us to implement a somewhat more generic data model that we have successfully used with other US data sets, such as Navteq's local streets layer. We will demonstrate the basic use of the new version of the library, and discuss the intrinsic challenges of address parsing and lookup. We also hope to show some examples whereby the Geocoder.US project can be adapted for use in geocoding addresses for countries beyond the United States.
Rate the workshop
I have •no •slight •huge interest in attending the workshop

OpenLayers: Vector Mayhem

Author: Tim Schaub
Abstract: The OpenLayers library provides core functionality to browser based mapping applications. This talk will focus on vector data related functionality – demonstrating options for requesting, styling, editing, and persisting vector features. OpenLayers includes a variety of layer types for requesting rendered map tiles. In addition, the library provides the capability to request remotely stored vector data for rendering in the browser. This presentation will cover the fundamentals for dealing with vector data – introducing participants to new vector related functionality in the library. The talk will include a quick overview of the OpenLayers library for those new to the project. We'll move on to the classes for managing vector data: Strategy, Protocol, and Format. Finally, through simple examples, we will demonstrate styling vector data – including coverage of the Filter, Rule, Style, and StyleMap classes.
Rate the workshop
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The use of Open Source in Canada's National Forest Information System

Author: Brian Low
Abstract: Canada's National Forest Information System (NFIS) was created in 2000 under the auspices of the Canadian Council of Forest Ministers. NFIS is a partnership of all provincial, territorial and federal governments in Canada. NFIS is designed to provide the capabilities to publish, analyze, synthesize and report on Canada's sustainable forest management. NFIS Canada has many applications and portals that are accessible to the public. These portals vary from forest inventory/land use, fire monitoring, climate change modeling to biodiversity/gene conservation decision support tools. To achieve these tasks, NFIS uses many geospatial open source software technologies. The NFIS Project Office also has developed and assisted in the development of many FOSS4G. This presentation will outline the NFIS project and the significant role FOSS4G has played.
Rate the workshop
I have •no •slight •huge interest in attending the workshop

How to Make a Point Cloud Rain Polygons

Author: Schuyler Erle
Abstract: Flickr, the well-known photo sharing website, allows its users to assign geographic point locations to the photos they upload, resulting in a database of millions of points, each associated with a variety of interesting and useful tags. With Flickr's support, we developed a Free Software tool called clustr to help with the interpretation of the "point clouds" formed by this massive database of points. The clustr tool combines rich Free libraries to generate polygons from a set of input points, using a generalization of convex hulls known as "alpha shapes". We will consider the possibilities inherent in Flickr's tagged point database, and show how alpha shapes can provide novel visualizations of portions of this database. We will take a tour through the algorithms and code, and discuss how you can use (and improve) clustr for your own purposes. There will also be pretty maps.
Rate the workshop
I have •no •slight •huge interest in attending the workshop

Framework for improving Geosoftware quality using TSPi process

Author: Maria Olmos-Siliceo
Abstract: The use of Geographic Positioning Systems (GPS), miniaturization technology, data digitalization and Web software development, have revolu-tionized geographic applications methodology development and utilization, bringing the necessity to look into Information Systems Development (ISD) models to accomodate geographic needs. Open Source GIS (OSGIS) application development has moved from local to multidimensional model environments; from geospecialists to regular users, developed by multi-teams with different cultural and professional profiles living in different locations around the globe, where the absence of visible software-development process creates chaos. ISD best practices experience were oriented to develop software using incremental development cycles that provide measurements which will support evaluation process model attachment. SCRUM process-improvement model based on agile methodology, together with Team Process Software (TSPi) is the framework proposed in this paper to improve OSGIS quality.
Rate the workshop
I have •no •slight •huge interest in attending the workshop

Building a SDI massively based on OWS

Author: David Jonglez
Abstract: ontext : Britany is a region localised in West of France. Britany gouvernment has developped for the last 7 years the culture of sharing data. The GeoBretagne project is the Spatial Data Infrastructure project for Britany. More over, the generic core developpement will be used for regional government SDI projects and put in a official forge for public administration applications , forge held by ADULLACT.org foundation. Purpose of the presentation : The presentation has different purposes : 1- present the project from a user point of view 2- present technical aspects of the project 3- show what and how it could be possible to implement new generic functionnalities inside existing OSGeo components in the context of a project. Technical aspect : GeoBretagne is based mostly on GeoNetwork, GeoServer and MapFish framework that include Open Layers, ExtJS, GeoExt, and other server side Java components. GeoBretagne uses a wide range of OGC Web Services : * WFS-T (GeoServer, OpenLayers) * WFS (GeoServer, OpenLayer, MapFish extractor) * WMS (GeoServer, GeoWebCache, OpenLayer) * SLD (GeoServer, MapFish styler) * WCS (GeoServer, MapFish extractor) * FE (GeoServer, styler, MapFish request engine) * CSW (GeoNetwork, OpenLayers) * WMC (GeoServer, OpenLayers) The main contributions to the Open Source softwares are : * Creation of a query client component on a similar approach to styler (MapFish, GeoExt) * Recovery and development of styler client component (MapFish, GeoExt) * catalog query module component from the Map client (OpenLayers / MpaFish and GeoExt)) * Increased integration GeoSource and GeoNetwork (GeoNetwork) * Layer Tree with tools for setting layers (MapFish, GeoExt) * Evolution of the print module to support SLD (MapFish) * WFS integration in the MapFish editing protocol managed (MapFish) * Support CAS protocol in GeoNetwork (GeoNetwork) * Integration of a monitoring tool links in the metadata (GeoNetwork admin) * Integration of a basket in GeoNetwork,used to list the selections for extractions, visualizations, deletion ... (GeoNetwork) * Support CAS protocol in GeoServer (GeoServer)

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ZOO project : an open WPS Platform

Author: Gérald FENOY
Abstract: The ZOO Project was born to provide a technical solution to the online geoprocessing needs encountered by the GeoLabs and 3LIZ companies. The ZOO platefrom is made of two parts : ZOO server, a WPS compliant C++ engine, and ZOO client which is a JSON based javascript API built on top of OpenLayers. The ZOO server is based on a « WPS Service Kernel » which constitutes the ZOO core system. It is able to dynamicaly load on demand various kind of services. A service could be view as a couple composed by a metadata file and the code for the corresponding implentation. The metadata file decribes all functions(s) which have to be callable using a WPS Exec Request. Services could be easily implemented in C++, Python or Perl and contains the functions of the service. Services developers should be able to implement services easily in their favorite langages without having to take care about formats of inputs and outputs for instance, storing results, this will be directly done by the WPS Service Kernel. The ZOO client is a JSON based javascript API designed to communicate with ZOO server using a GeoJSON proxy to make use of ZOO Server input/ouptut only with Javascript and Mapserver.
Rate the workshop
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Geoprocessing in the Clouds

Author: Bastian Schaeffer
Abstract: Cloud Computing is one of the latest trends in the mainstream IT world. The term Cloud Computing uses a cloud metaphor to represent the internet or other large networking infrastructures. From a provider perspective, the key characteristics of the cloud are the ability of data centers to dynamically scale and provision computational power, storage, and other applications even complete infrastructures in a cost efficient and secure way over the internet. From a customer perspective, the ability to make the most of that power without having to manage the underlying complexity of the technology is most important. The presentation will give a detailed introduction to Cloud Computing and will show how Spatial Data Infrastructure components can be used in a cloud environment. In particular, results of our experiments regarding the integration of an Open Source OGC Web Processing Service in the Google and Amazon Cloud will be presented.
Rate the workshop
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From Geodata to Geoinformation-52North Web Processing Service (WPS) and SEXTANTE

Author: Bastian Schaeffer
Abstract: Today's Spatial Data Infrastructures provides several means to find and consume data. However, the most important step is still performed with classical desktop GIS solutions: Processing Data to derive information. To fill this gap and to automate spatial related business processes-interoperable processing services have been standardized recently. The Open Geospatial Consortium (OGC) developed the Web Processing Service standard. This internet based service allows the web based execution of geoprocessing functionality. However, current WPS implementations provide only limited and simplistic geoprocessing functionality. The intrinsic complexity of geodata requires often more complex functions. The open source SEXTANTE geoprocessing library provides over 220 geoprocessing algorithms. These algorithms allow the comprehensive processing of raster and vector data. The presentation will give a brief introduction to web based geoprocessing and the SEXTANTE library. On this basis, it will be shown how SEXTANTE functionalities exposed as interoperable 52North WPS processes can be integration into existing SDIs and thereby bridge the gap from geodata to geoinformation.
Rate the workshop
I have •no •slight •huge interest in attending the workshop

Integration of ILWIS functionality in web based Spatial Data Infrastructures

Author: Bastian Schaeffer
Abstract: ILWIS as a standard tool of the open-source GIS community provides valuable analysis functionality as a desktop GIS. With growing network capacity and processing power, some efforts have been made to integrate stand-alone geoprocessing applications and their expert functionality into a web service environment. Since standardization and interoperability is a key aspect in SDIs, open standards such as issued from the Open Geospatial Consortium (OGC) create a solid foundation for integrating Processing Services in existing distributed environments and especially service chains. The OGC Web Processing Service (WPS) specification, which became an official standard in mid 2007, is a major attempt to address this issue in a standardized way. This presentation will give a solid introduction to the WPS

standard and present an approach of overcoming the identified lack of processing functionalities in open standards based SDIs by exposing ILWIS functionality as web services in a standardized way. The presented approaches will be validated by means of a real world scenario. A geoprocessing workflow will be modeled to solve a given problem in the field of climate change.

Rate the workshop

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Prioritized Geoprocessing in the context of cloud computing

Author: Bastian Schaeffer

Abstract: Distributed geoprocessing provides a powerful means to process large amounts of data in an efficient way. Especially grid and cloud computing technologies are the most promising candidates. Standards play a key role to ensure interoperability. In terms of distributed processing, the Open Geospatial Consortium released the Web Processing Service specification. However, long running computations cannot be prioritized which becomes especially important in emergency cases. This presentation will show how the Web Processing Service can be extended in order to prioritize requests. On this basis relevant business models will be elaborated in the context of the cloud computing paradigm. A real world scenario using the 52North Web Processing Service implementation will show the applicability of our approach.

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Secure Delegation in Geoprocessing Workflows

Author: Bastian Schaeffer

Abstract: The rapid evolution from monolithic desktop GIS applications with tightly coupled geodata to service oriented Spatial Data Infrastructures (SDI) with independent, interoperable and distributed web services has changed the GIS world fundamentally. The next step in this evolution process is the mapping of whole business processes in SDIs. This leads to cross-enterprise workflows as virtual business processes. Outsourcing and delegating specific tasks to specialized service providers is a missing piece in the development of geoprocessing towards a fully service oriented geodomain as a foundation for future SDI business models. However, partners will only conduct business if their (geo)rights, trust and security requirements are met. Up-to-now, securing single OGC web services is feasible with mainstream technologies such as WS-Security. But in workflows, clients have to delegate authority to third parties in different security domains such as workflow engines. This talk will present an approach which allows the standardized and secure delegation in complex geoprocessing workflows based on OGC web services.

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GISVM Server, Your Open Spatial Virtual Server

Author: Ricardo Miguel Moreira de Pinho

Abstract: In the past, commercial GIS software companies have based their business model on offering a complete and closed GIS solution, with proprietary file formats and proprietary drivers to access all types of external data. Today there is a way to solve the resulting incompatibility problems, with Open Spatial Standards from OGC and their extensive implementation from Free Open Source Software for GIS (FOSS4G). GIS Virtual Machine Server, offers the GIS user an easy way to start using FOSS4G with their current GIS software solution, to enter into the world of OGC Open Geospatial Standards and benefit from the power of real interoperability. There will be a presentation on the possibility of using GISVM Server with two proprietary software solutions, Autodesk AutoCAD MAP and ESRI ArcGIS, which will demonstrate how it is possible to access a PostgreSQL with PostGIS, a Simple Feature Geospatial Database, using FDO drivers or ZigGIS, and several OGC Web services, such as WMS and WFS.

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Robust artificial structure detection and building detection from a single Satellite image

Author: Jyothish Soman

Abstract: We present a unsupervised method to identify man made structures from satellite imagery. The methodology builds upon the existing techniques and tries to imitate human perception as closely as possible. The definition of artificial components used here is a zone where the local variance is low, these areas are found by running a sobel filter and identifying regions of very low intensities. These areas coupled with continuous lines of high magnitude in the transformed image, form our search space. The artificial regions are large zones with low variance, and buildings candidates are artificial regions with at least four mutually orthogonal bounding lines, which are within a limited proximity

of the candidate zone. The candidates are then processed based on shadow evidence, to eliminate overlaps and to remove roads , water bodies and other flat structures.

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Best of both worlds: Bringing advanced analytical capabilities to open source GIS

Author: Carson J. Q. Farmer

Abstract: Open source GIS related software projects are experiencing a period of rapid growth and development. Despite this, the implementation of FOSS projects focused on advanced spatial analysis and geocomputation has been much less prevalent. This has lead some researchers to implement advanced spatial analysis methods in the form of libraries or packages for existing data analysis environments. One such environment is the R language for statistical computing. In this talk, I present manageR, a Python tool designed to 'bridge the gap' between FOSS GIS and advanced spatial analysis in R. By combining the analytical strengths of R with the GIS capabilities of Quantum GIS, manageR effectively streamlines the practical research process. The utility of manageR is demonstrated through the development and implementation of a geographically weighted regression (GWR) analysis of educational attainment in the state of Georgia, U.S.

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Introduction to Geomajas as SDI platform

Author: Dirk Frigne

Abstract: Geomajas is an Open source Web mapping software framework enabling 'real integrated GIS via the browser'. It is designed to aggregate and integrate Geographic information, coming from different sources, on the server before present them in the browser where users can act on the data in a very intuitive way. Geomajas provides the wiring up to handle all the UI actions executed on the data via backend integration. After positioning Geomajas in the landscape of other webmapping solutions, the presentation will focus on real use cases and zoom in on the best practices learned. We will end with a sneak preview of the future roadmap and what can be expected in the near future. Geomajas includes: Geometry and attribute editing with snapping support Complex attribute and relation mapping (one-to-many, many-to-one), helping you implement business logic (BI) Advanced querying capabilities (searching, filters, styles, ...)

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Building a web mapping application with GeoExt

Author: Sebastian Benthall

Abstract: GeoExt (www.geoext.org) is a JavaScript library that provides a groundwork for creating web-mapping applications. As a practical introduction to GeoExt, this presentation will walk through how to build a simple data browsing application using the building blocks GeoExt provides. GeoExt combines the web mapping library OpenLayers with Extjs, a cross-browser JavaScript library for building rich internet applications. After a brief introduction to the range of applications that can be built with GeoExt, we will demonstrate how using basic JavaScript one can quickly build a simple web application that lets users view and manipulate the contents of a map.

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Free GIS-based land suitability model for fruit trees cropping in Colombia

Author: ljmartinezm

Abstract: Land unit definition and its characterization are basic tasks in the land suitability analysis. Until recently manual methods were used for delineating land units and suitability analysis was done mainly in a qualitative way. The availability of DEMs and the GIS capabilities make feasible to apply a more quantitative approach. The purpose of this case study was to evaluate the capabilities of the free GIS software GRASS and SAGA to determine several terrain parameters that can be useful in the land suitability analysis and integrate them in a suitability model. A DEM from Terra-ASTER data and a one from SRTM were used to calculate curvature, slope, aspect, wetness index, relief index solar radiation. Results for key parameters were compared with those of traditional methods and indicate that a good improvement of traditional methods can be obtained at a low cost and with appropriated confidence

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FLEX/Mapserver application for the Brazilian Industrial Fishing Vessels Monitoring Program

Author: Rafael Medeiros Sperb
Abstract: A web-based information system was implemented in 2007 for the Brazilian Industrial Fishing Vessels Monitoring Program (PREPS) using open source technologies, such as PostgreSQL (PostGIS, PL/PGSQL) and Symfony (PHP MVC Framework). In its fourth version it includes features such as intelligent agents that controls vessel operation in exclusion areas and distress requests; SOAP Web Services for tracking data reception and delivery; and a Adobe Flex WebGIS interface combined with MapServer for visualization of vessels that are operating on Brazilian jurisdictional waters, as well as on the Commission for the Conservation of Antarctic Marine Living Resources – CCAMLR areas. In this presentation we explain the PREPS' architecture, with emphasis about the rich interface (FLEX) for Web Mapping (i.e., usability, accessibility and high performance).
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UML2GML schema Eclipse plug-in

Author: Rafael Medeiros Sperb
Abstract: This work aimed at developing an Eclipse plug-in to allow the conversion of UML models to GML schemas. A plug-in is an extension mechanism of Eclipse, which is a platform of a set of services used for building applications. The implementation of the plug-in involved many concepts and technologies such as Eclipse platform; MDA (Model Driven Architecture); GMF (Graphical Modeling Framework); EMF (Eclipse Modeling Framework); UML2 (UML 2.x standard in metamodel format); JET (Java Emitter Template); Papyrus UML editor. In order to validate and test the plug-in, a case study was elaborated, based on a UML model proposed by CONCAR (Brazilian Commission on Cartography). In the end of the case study, a GML schema was generated. This schema was used stemed a fully valid and functional GML document. The case study results show the large potential of the tool proposed by this work.
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Coordinating development activities in complex environments

Author: Bob Bouvier
Abstract: FOSS4G is helping to create institutional behavioral changes, initiating a new standard of openness that encourages information sharing. Data exchange can help development agencies, governments and civil societies to make better judgments regarding use of foreign aid resources. Historically, data sharing among development peers has been hindered by a myriad of factors including expensive & unsustainable GIS projects, poor security, lack of standards, etc. The free and open source GIS stack supports the deployment of sustainable and relatively inexpensive solutions, an approach that holds much promise in reducing the barriers to providing rich applications for coordinating aid and development activities. Our solution, used to track aid activities in various countries, will be presented along with a discussion of the various policy issues and lessons learned.
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A WebGIS for the management, use and protection of the heritage of the municipality of Orgosolo.

Author: Giuseppina Vacca
Abstract: This study is part of a wider project promoted and financed by the Municipality of Orgosolo (Nuoro, Italy), for the creation of a Centre for monitoring and documenting the local traditions and skills, now at risk because of the economical, social and cultural mutations in the lifestyle, belonging from world globalization. In particularly in this paper we presented a study to design and build a WebGIS for the management, use and protection of all the tangible and intangible heritage of the municipality of Orgosolo. The WebGIS was built using only free / open-source software, both for the advantages in terms of customization and interoperability, and in order to limit the building and management costs. The first part of the work regarded building the GIS. The used software was gvSIG that offers an user-friendly interface and a fast access to the most common raster and vector formats. The database was built in MySQL and then connected with gvSIG. The GIS included the data on the urban architecture and murals regarding the tangible heritage, and on the traditional skills for the intangible heritage. The next step was implementing the GIS in a WebGIS system thusly structured: Apache Web Server; Geoserver WebGIS. was chosen due to being an open source (GPL) WebGIS server written in Java and supporting the OGC (Open Geospatial Consortium) standards, such as the WFS, WMS and WCS geoservice protocols.
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Web Mapping Performance Shoot-out

Author: Paul Ramsey

Abstract: This is the latest installment in an annual series of benchmarks and presentations that pit open source and other web mapping servers against one another in a suite of performance tests. The presentation seeks to find out the optimal software configurations and to compare the performance in different real world use cases, such as large data handling, OSM like rendering, large raster serving and - Hide quoted text - WFS scalability. MapServer and Geoserver will be compared, as well as different back-end data sources, such as PostGIS and Shapefiles. [Note to reviewers, other servers may also be added to the test, pending participation by community members.]

Rate the workshop

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The State of PostGIS

Author: Paul Ramsey

Abstract: What can PostGIS do? What features does it have? What has changed in recent versions? What new features are upcoming in future releases? This talk will cover the history and development of the PostGIS spatial database server.

Rate the workshop

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Managing Hydrodynamic Models With PHP and MySQL

Author: Andrew Goodwin

Abstract: Hydrodynamic modelling can be a considerable challenge. Many of the datasets involved are spatial and/or temporal in nature and can be quite large. This paper focuses on the management of input and output data from the RMA-2 finite element hydrodynamic model using a series of PHP scripts and classes that have evolved over the past 6 years. The flood modelling process involves the development of a terrain model, generation of a finite element mesh, integrating input data from numerous sources, storing and summarising sizable volumes of output data and mapping the results. These tasks were achieved using a substantial class library that has been developed in PHP to manage the generation and management of meshes used in the modelling process. MySQL was used to store data at various stages throughout the modelling process. This paper outlines how PHP and MySQL have been used to streamline the hydrodynamic modelling process and describes in detail some of the mesh generation PHP classes that have recently been released as open source.

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Open Access Spectral Library

Author: Firman Hadi

Abstract: Land use land cover monitoring usually carried out by government institution to monitor the development implementation and to assess its impact on natural environment every two or three years. It usually consists of remote sensing image interpretation and field checking to validate the image classification. The use of spectro-radiometer will help in identifying the objects spectral signature. This will also help in making spectral libraries which can be used as input in remote sensing software to classify land use land cover. Spectral library from previous survey will provide database and the training samples data can be used repetitively which then will minimize costs over years. Unfortunately, not many organizations or institutions have spectro-radiometer and they rarely manage the data and build spectral library. This paper will focus on the initiation of developing an open access spectral library. This will help stakeholders to gain information on spectral library of land use land cover. By this, the expected land use land cover classification accuracy will improve with less effort in field surveys.

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Using open source geospatial technology in a national environmental regulatory program.

Author: Jon Soderberg

Abstract: The US Army Corps of Engineers Wetland regulatory program utilizes open-source geospatial tools and mapping in the daily operation of the program. The US Army Corps of Engineers regulatory program's data collection and management traditionally was a decentralized operating system consisting of 38 different data collection systems ranging from hand ledgers to advanced desktop deployments of GIS. This decentralized method of operation required a large number of national data calls, inconsistent reporting, and inconsistent business practices. In 2007 the US Army Corps of Engineers Wetland regulatory program deployed the second generation of a national consolidated data tracking and management system known ORM2. ORM2 merged 38 different data collection systems, while providing the user with a web based unified data collection methods and a series of geospatial tools previously reserved for those with standalone client based GIS systems. From a utilization standpoint, ORM2 is among the largest spatial databases within the Federal government. Over 600 users login each day creating millions of data elements that need to be tracked, managed and

reported on spatially. While focusing on the day-to-day users needs in conjunction with national data collection and reporting requirements, a user-friendly interface including basic mapping and geographical information consumption was developed on an Oracle platform using open source geospatial programming as the national mapping component. Use of the open source geospatial programming allows not only a simplified user interface but a consistent platform across many US Army Corps of Engineers business lines and has allowed for simple data interoperability.

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MIT GIS Services – Supporting GIS In A Dynamic Academic Environment

Author: Lisa Sweeney

Abstract: MIT GIS services supports GIS in teaching and research in all disciplines at MIT. We help support a dynamic community working to solve exciting, real-life problems. The users we support have a wide range of experience levels - from beginners completely new to GIS, to advanced users who have had years of professional experience using GIS. With a small team, made up of GIS professionals, librarians, and student assistants, MIT GIS Services provide consultation services to help people in the MIT community with a variety of challenges that can arise with GIS projects. We help people think through their project ideas, understand the types of tools that are available to them, which tools are most appropriate to use, and how to use them. We also help people find and use the data they need, which often times comes from many different sources, in a variety of formats. MIT GIS services also maintains an international collection of GIS data. We have a geodata repository system for searching, viewing, and accessing GIS data through a web browser and through GIS software. We regularly seek new and better ways to support our user community and to automate storing, searching, networking, retrieving, and improving access to geodata.

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Spatial and Non-Spatial Information on Flood Monitoring

Author: Ponthip Limlahapun

Abstract: Data/Information is one of the important key elements to predict and evacuate prior to an emergency; to control during the phase of an emergency and/or to recover during the post emergency. Presently, there are numerous of flood monitoring and warning system. Yet, the means of immediate integrating the data from various sources such as in-situ data, and satellite images over the web based is rare. Therefore, this research paper focuses on the compilation of meteorological data to support on flood monitoring and warning system over the user-friendly web based interface. Assessment to all function will be managed through the interactive web based system. This paper discusses one of the applications on spatial and non-spatial information. The system is designed as a peer-to peer platform for distributed information. Two main components are included: 1) Hydrological and Meteorological Receiving Component; 2) Flood Early Warning System. The first task is to develop hydrological data and meteorological as such rainfall receiving system. The second task is to complete the warning system available over the geo-spatial web based system.

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A 3D Indoor Pedestrian Simulator using a spatial DBMS

Author: Chulmin Jun

Abstract: Most crowd simulation models for pedestrian dynamics are based on analytical approach using experimental settings without being related to real world data. In order for the models to be adapted to real world applications such as fire evacuation, some technical aspects first must be resolved. First, the base data should represent the 3D indoor model which contains semantic information of each space. Second, in order to communicate with the indoor localization sensors to capture the real time pedestrians and to store the simulation results for later uses, the data should be in a DBMS instead of files. The purpose of this paper is two folds. One is to suggest a DBMS-based 3D modeling approach for pedestrian simulations. The other is to improve the existing floor field based pedestrian model by modifying the dynamic field. We illustrated the data construction processes and simulations using the PostGIS DBMS and the enhanced pedestrian model.

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A 3D Indoor Crowd Simulator using a spatial DBMS

Author: Hyeyoung Kim

Abstract: Most crowd simulation models for pedestrian dynamics are based on analytical approach using experimental settings without being related to real world data. In order for the models to be adapted to real world applications such as fire evacuation, some technical aspects first must be resolved. First, the base data should represent the 3D indoor model which contains semantic information of each space. Second, in order to communicate with the indoor localization

sensors to capture the real time pedestrians and to store the simulation results for later uses, the data should be in a DBMS instead of files. The purpose of this paper is two folds. One is to suggest a DBMS-based 3D modeling approach for pedestrian simulations. The other is to improve the existing floor field based pedestrian model by modifying the dynamic field. We illustrated the data construction processes and simulations using the PostGIS DBMS and the enhanced pedestrian model.

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Open Source GNSS Reference Server for Assisted-Global Navigation Satellite Systems

Author: binghao

Abstract: Assisted-Global Navigation Satellite Systems (A-GNSS), or Assisted-Global Positioning Systems (A-GPS) in particular, are now commonly accepted as an effective way to reduce the time-to-first-fix (TTFF) in GPS-unfriendly environments, e.g. in areas of weak GNSS/GPS signals. Today's location-based service (LBS) devices such as GPS-enabled mobile phones and personal digital assistants (PDA) rely on A-GPS, however, such commercial devices are equipped with an integrated A-GPS chip that makes customisation very difficult. The Open Source GNSS Reference Server (OSGRS) provided by the University of New South Wales is an open source Java application that can generate the necessary data for A-GPS clients. This paper introduces the current status of OSGRS and discuss the challenges for OSGRS and future work. The GNSS Reference Interface Protocol (GRIP), based on extensible markup language (XML), is employed as the OSGRS interface protocol. A data source for OSGRS can be any GNSS (or GPS) stations with known coordinates, although permanent GNSS reference stations are preferable. Therefore the Sydney Network (SydNet), a GNSS network of continuously operating reference stations, has been used as a test bed in order to demonstrate the concept of OSGRS.

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The Capacity Building Tools 'FOSS4G'

Author: Phisan Santitamnont

Abstract: Abstract The FOSS/GRASS 2004 conference that was held in Bangkok Thailand saw the coming together of GRASS and Mapserver communities. The abbreviation 'FOSS4G' comes from 'the Free/Libre and Open Source Software (FOSS) for Geoinformatics' and the term was coined by Venkatesh Raghavan of the Osaka University during his academic sabbatical leave at Chulalongkorn University in Thailand. The 2004 FOSS4G conference was very successful and has encouraged Thai to use more FOSS4G since then. Last year 2008 Thailand has just launched two remote sensing satellites namely, Thai Earth Observation Satellite (THEOS) and Small Multi-mission Satellite (SMMS). The dual satellite systems are generating high geometric resolution of 2-meter and high radiometric resolutions of 5 nano-meter for 128 bands and they are complementarity imaging the earth with medium-resolutions of 15 and 30 meter. The government are now developing software for supporting processing of THEOS data using FOSS4G. Initial designed of the FOSS4G support THEOS is based on world-class FOSS GDAL, OGR, OSSIM and Orfeo. Several training courses for capacity building for Thai have been developed and have handed over the hundred of Thais and other neighboring nations as well. FOSS4G is also successfully deployed in many government projects for environmental agricultural and infrastructure administrations. FOSS4G will definitely be the core component of the emerging Geospatially-aware Thai Society. This presentation outlines recent FOSS4G initiatives in Thailand and discuss its relevance for theSoutheast Asia region.

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A Campus Spatial Information System using the PostGIS

Author: Hyunjin

Abstract: Most 3D models found in the literature focus on theoretical topology for exterior volumes. However, implementing a full topology for the indoor spaces is less practical due to the computational complexity and current spatial DBMSs do not support explicit 3D topological relations between geometric components. In this study, an alternative method to build a 3D indoor model with less complexity using a spatial DBMS is suggested. Focusing on the fact that semantic attributes can be stored on the floor surface, we suggest a multi-layered 3D model for indoor spaces. We show the process to build the proposed model in the PostGIS. And, then, as an example application, we illustrate the process to build and run a campus building information system.

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Maps and BI for large organizations

Author: Jules Paquette
Abstract: Borealis uses interactive maps, reporting tools and dashboards to provide through-the-web access to an organization's strategic information. Originally developed for the mining industry, Borealis' Information Management System (IMS) is based on free and open source software and features centralized, workflowed and access-controlled information management. The toolset provides managers and other user roles with timely information about key business indicators such as for example budget information, field activities progression, environmental as well as health and safety issues. Maps are generated using free software tools including OpenLayers, MapFish, GeoExt and MapServer/ TileCache with the data stored in PostGIS or shapefiles. Maps can be either included directly in reports (using Jasper Reports) or accessed directly in the IMS. Geographic information is retrieved in standard GeoJSON format using FeatureServer and can be repurposed in the IMS for a customer's particular use cases.
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Cloud database to store map data

Author: caio nakashima
Abstract: The cloud computing and WEB 2.0 concepts are the basement of solutions that we developed. Our challenge was represent a lot of information through maps dynamically constructed. The data should be collected in internet and saved in internet too (web database). As delicious web site where users can store their own bookmarks, in our solution the users can store any time the own data whenever and wherever they need and want. With this datum users can manipulate then, as spreadsheet, making some combinations in columns, constructing graphics and indicators. All data can be representing in maps, using a one or more columns as polygon or point. The color of each polygon and the shape and color of each point can be defined online by the user. The restriction of the solution is limited by the shape files stored in cloud database, because the uploaded data must reference one of the stored file. When I was writing this paper, our database stored Brazilian municipalities and state shape. So, all data must have these shape geocode reference. For more detailed information, we use the Google Maps facilities to store the GIS coordinate of the objects.
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Flood mapping and monitoring service build entirely with FLOSS software

Author: Vasile Crăciunescu
Abstract: Flooding remains the most widely distributed natural hazard in Europe, leading to significant economic and social impact. The remote sensing of the Earth is presently capable of making fundamental contributions towards reducing the detrimental effects of extreme floods. Various processing techniques are used to combine the optical and radar images and map the flooded areas. The results are aggregated using an on-line geospatial aware system. The interested users are able to access the system in order to display, query, analyze and retrieve flood related information's. The system is build entirely with standard compliant free and open source software applications like GDAL, GRASS, OSSIM, Geoserver, Geonetwork, PostgreSQL + Post GIS, OpenLayers.
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Live Demonstration of DEWS

Author: Matthias Lendholt
Abstract: The DEWS (Distant Early Warning System) project, funded under the 6th Framework Programme of the European Union, has the objective to create a new generation of interoperable early warning systems based on an open sensor platform. This platform integrates OGC SWE compliant sensor systems for the rapid detection of earthquakes, for the monitoring of sea level, ocean floor events, and ground displacements. Based on the upstream information flow DEWS focuses on the improvement of downstream capacities of warning centres especially by improving information logistics for effective and targeted warning message aggregation for a multilingual environment. Multiple telecommunication channels will be used for the dissemination of warning messages. Wherever possible, existing standards have been integrated. The Command and Control User Interface, a rich client application based on Eclipse RCP and the open source GIS uDig, integrates various OGC services. Using WMS and WFS spatial data are utilized to depict the situation picture and to integrate a simulation system via WPS to identify affected areas. Warning messages are compiled and transmitted in the CAP (Common Alerting Protocol) standard together with addressing information defined via EDXL-DE (Emergency Data Exchange Language - Distribution Element). Internal interfaces are realized with SOAP web services.
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gvSIG Mini. OSM for almost every phone.

Author: Javi Carrasco, Alberto Romeu, Miguel Montesinos
Abstract: gvSIG Mini is the latest GIS for mobile phones. It's able to display OSM, Microsoft and Yahoo maps, to cache this information on the storage card, calculate routes and search and display addresses and points of interest using OpenStreetMap services. gvSIG Mini is able to run on almost every phone and its license is GPL.
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Sensor services in gvSIG

Author: C. Sánchez, M. Montesinos, F. Peñarrubia,A. Tamayo
Abstract: A first prototype has been developed on top of gvSIG and gvSIG Mobile for handling Sensor services. An OGC-SOS (Sensor Observation Service) client has been implemented. gvSIG desktop and Mobile are able to acces sensor observation data, rendering sensor location on screen with the ability to use thematic representation and displaying sensor data in tabular format. gvSIG desktop is also able to show custom graphics with sensor data. This is a first step towards a more powerful sensor data integration on gvSIG.
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OpenGeo: a 'dot-org' to build the Open Geospatial Web

Author: Chris Holmes
Abstract: OpenGeo: A 'dot-org' to build the Open Geospatial Web This talk will discuss OpenGeo, a social enterprise that competes in the market in order to sustain its mission of an Open Geospatial Web. The primary goal is not to make money for investors, but rather to build great open source software, by achieving full cost recovery in a non-profit structure. The organization employs the top developers on best of breed geospatial tools: PostGIS, GeoServer, GeoWebCache and OpenLayers. OpenGeo supports their work by marketing and selling it as 'The OpenGeo Stack', promoting the software against proprietary vendors, offering enterprise quality support and service contracts. The goal is a win-win-win for all: * Open source software wins, as developers are supported financially to work full-time on improving the software. * Institutional customers win, as they finally have access to a one-stop support shop for complex open source spatial deployments; * Open source users win, as the software they depend on accesses a sustainable funding stream to continue maintenance and development; * Core developers win, by getting to do what they love for a living. Included in the presentation will be the history, philosophy and goals of OpenGeo and The Open Planning Project, its parent organization. Also discussed will be the financial structure, as a potential model for social, sustainable investment in open source software to provide ever increasing returns for good causes.
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Media Mapping: Using Georeferenced Images/Audio to support Data Analysis

Author: Phil Bartie and Simon Kingham
Abstract: Field based environmental monitoring projects often fail to gather supporting temporal information on the surroundings, yet these external factors may play a significant part in understanding variations in the collected datasets. For example when sampling air quality the values may change as a result of a bus passing the sampling point, yet this temporal local information is difficult to capture at a consistently high resolution over extended time periods. Here we develop an application which runs on a mobile phone able to capture visual and audio data with corresponding time and location details. We also develop a desktop analysis tool which synchronises the display of this dataset with those captured from environmental sensors. The result is a tool able to assist researchers in understanding local changes in environmental datasets as a result of changes in the nearby surrounding environment.
Rate the workshop
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Improving Community Safety Though Wildfire Mitigation - an Open Source Case Study

Author: Alistair Hart
Abstract: In his presentation, Alistair will present a case study reviewing the success of the Northern Queensland Wildfire Mitigation Project (NQWMP), which delivered a collaborative online data warehouse and mapping tools for all wildfire mitigation stakeholders in the region, including all three levels of government. NQWMP exploited free and open source technology and has been embraced by the project stakeholders and provides an outstanding example of successful deployment of open source technology. Alistair believes that NQWMP is the first Australian open source mapping application developed for emergency management to make it into production. The presentation will cover: * Mapping website functionality and architecture * Why was Open Source selected? * What were the alternatives? * What issues did

we ran into and how did we solved them? The NQWMP project was recently highly commended by the Excellence in e-Government Awards (e-Awards) and was the only Local Government project in the finalists.
Rate the workshop
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BioSIRT - A national system using Open GIS components

Author: Ian Miller
Abstract: BioSIRT is a new agricultural emergency and routine incident management system developed for a consortium of all state and Commonwealth primary industry departments. BioSIRT includes a substantial and tightly integrated mapping component which must integrate with Jurisdictional GIS infrastrutures. Given the range of largely vendor-based GIS platforms used by the various departments, the open standard approach was the only way to go. This presentation will cover the BioSIRT architecture and how it is being integrated by various government departments, including issues such as toolsets used, standards to be met and skills development. BioSIRT is put forward as a good example of the mainstreaming of open source and open standards GIS software.
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Rabbitscan - a community science challenge

Author: Ian Miller
Abstract: The Rabbit Management Advisory Group is a collaborative and independent group of landholders, industry, scientific and government experts, individuals and groups who are concerned about the impacts of rabbits on both environment and productivity. They have run the RabbitScan Challenge to build an evidence base for the perceived growing threat of rabbits to agriculture and the environment. Rabbitscan aims to have the community undertake a large number of simple surveys of rabbit numbers across Australia and record the results in a central website to provide a clear picture of the nature and location of the rabbit threat. Rabbitscan was developed using the Google Maps API, integrated with the Joomla open source CMS and utilising MapServer to efficiently support the display of the survey results. This presentation will describe and demonstrate the Rabbitscan web mapping application and discuss some of the challenges faced in integrating MapServer and Google Maps.
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GRASS for Dam Failure Risk

Author: Massimiliano Cannata, Roberto Marzocchi
Abstract: In the XXI century around 200 notable dam and reservoir failures happened worldwide causing massive fatalities and economic costs. In order to reduce the losses managers usually develop flooding area due to dam break with hydrodynamic models and then import it within a GIS to perform risk analysis. This two step procedure is time expensive and error prone, due to export/import requirements, and not user friendly. For this reason with this work, a new numerical model for the solution of the two-dimensional dam break problem has been implemented in the GRASS GIS as a GIS embedded module. The model solves the conservative form of the 2D Shallow Water Equations (SWE) using a Finite Volume Method (FVM); the inter-cell flux is computed by one-side upwind conservative scheme extended to a two-dimensional problem. The new developed GIS module, among others outputs, allows to derive maximum intensity maps that can be directly used in the risk assessment. The model has been verified by results comparison with two standard synthetic problems referenced in literature. Finally, the model was tested in a real case comparing existing official flooding maps. The problem formulation, the new GRASS module and its validation is presented.
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OldMapsOnline.org: open source and old maps

Author: Klokan Petr Pridal
Abstract: OldMapsOnline.org project is developing and improving open-source software tools for map publishing, processing, georeferencing and spatial search in map collections. We are designing a workflow where libraries and other institutions are publishing scanned maps and online visitors are collaborating on georeferencing, view visualizations of the cartometric accuracy analyses and cooperate on geometadata editing through a web browser. We have already produced several web-based tools (BoundingBox for MARC21/DublinCore, Online Georeferencing Tool) and open-source software tools like a JPEG2000 image server (based on IIPImage), rectification server for dynamic warping of remote images into WMS (based on GDAL and MapServer) or MapTiler - a desktop application for online mashups and overlays for Google Earth, Google Maps and other interactive web maps. We use tools like GDAL, OpenLayers, GeoNetwork, IIPImage, MapAnalyst and we are also submitting patches back to these projects. This presentation will demonstrate an open-source tool chain and methodology for efficient, cost-effective and user-friendly online processing

and presentation of old maps. Most of the tools are open-source and reusable by any third-party for free. OldMapsOnline.org project will finish in 2011 and is backed by the Moravian Library in Brno with financial support from the Ministry of Culture of the Czech Republic as a R&D project DC08P02OUK006. More info at http://www.oldmapsonline.org/.

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Studio: web 2.0 mapping application generator

Author: Cédric Moullet

Abstract: With Studio, you can create your own web 2.0 mapping applications, publish it on Amazon cloud computings services, generate OGC web services and provide advanced functionalities like edit, print, search, tooltip, without edition of lines of code ! Studio is the administration tool of the MapFish development framework. It is composed of three functional parts: - Data manager for the upload of data and storage in PostGis or as raster/vector files - MapFile manager: the WYSIWYG MapFile editor which allows the user to easily define symbology and configure OGC webservices like WMS and WFS for MapServer - MapFish manager: the tool to configure the web mapping application. With it, the user can define geographic layers, configure edit, print, tooltip, search functions and publish the web mapping application on Amazon cloud computing services.

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Case study. map.veloland.ch or how to provide high availability web mapping solutions ?

Author: Cédric Moullet

Abstract: map.veloland.ch or SwitzerlandMobility is the national network for non-motorized traffic, in particular for leisure and tourism. It contains hiking, cycling, mountain biking, skating and canoeing information and help the user to organize it's trip around Switzerland. In average, more than 100'000 unique users are visiting the map every day, but, when the sun shines, this can be really more ! We will discuss in this presentation the following aspects: - Architecture of high availability web mapping applications - Usage and optimisation of Tilecache for the generation and merge of TB of tiles - Hosting on Amazon cloud computing services: S3, EC2, EBS etc...

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How to create a web 2.0 mapping with MapFish development framework ?

Author: Cédric Moullet

Abstract: MapFish is an open-source development framework for building web-mapping applications. MapFish is based on the GeoExt library which is a combination of ExtJS and OpenLayers, and extends the Pylons general-purpose web development framework with geo-specific functionnalities. We will present the necessary steps for the creation a web mapping application based on the MapFish development framework: - Creation of client UI with MapFish javascript library framework. - Creation of server controlers with Python, Shapely and SQLAlchemy. MapFish server combines several technologies in order to facilitate the data access and the data manipulation on the server side. The data are accessed through REST services.

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GeoServer, GeoTools and GeoBatch: supporting operational Meteorology and Oceanography

Author: Simone Giannecchini

Abstract: Supporting operational Meteorology and Oceanography is a challenging task due to complexity and heterogeneicity of the data to manage, which must be available on time, at the right place, and which is usually obtained from a wide number of sensors (satellites, autonomous veichles, in-situ sensors, etc) and prevision models. Moreover, very often, new data is produced on the fly for statistical purposes (e.g. ensemble modeling) or to be used as input for refined processing (e.g. multiple cascaded model runs). To complicate things further such data is usually multidimensional (x,y,z,t,band). We will present and discuss the solutions developed and employed at the NURC (NATO Undersea Research Centre in Italy) as well at the LaMMa (Laboratory of Monitoring and Environmental Modeling) the operational weather service of Tuscany Region in Italy, based on an open source GIS software, to store, convert, fuse and deliver the above mentioned datasets.

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The geoSDI project, the Italian Civil Protection National Spatial Data Infrastructure

Author: Simone Giannecchini
Abstract: The geoSDI project aims to build the Italian Civil Protection National Spatial Data Infrastructure. The Technological Competence Center IMAA-CNR, is currently developing the geoSDI system together with the National Civil Protection Department and the other Functional and Technological Competence Centers. By means of such system, the network of the Regional Functional Centers (FC) and Technological Competence Centers (CC) will cooperate implementing the National Alerting System, supporting geospatial data sharing for decision makers as well as real time and non-real time analysis. The geoSDI initiative is based on Open Source Technologies and strives to be OGC standard compliant, INSPIRE Directive compliant GMES Global Monitoring for Evironment and Security tasks and CNIPA specifications compliant. The main building blocks are represented by the GeoServer and GeoNetwork frameworks, for geospatial data and metadata management. An integrated portal for OGC Web Services called geoSDI-ERA is actually being built, using well-known open source tools, like OpenLayers.
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An hybrid GIS solution to manage the French gas utility network

Author: Nicolas BOZON
Abstract: This work aims to present an open source hybrid GIS solution developed by the 3LIZ company, to provide a mapping solution to GRTGaz company which is the first French gaz supplier. The main need was to best manage the gaz pipes network with an easy to use GIS software. The latter is based on the coupling of the Mozilla platform (i.e XulRunner) and some of the Osgeo components (namely OGR, Proj and OpenLayers). This provides a light and multiplatform GIS desktop environment, which is able to call for any webservice (i.e REST API, WMS, Google maps API..), but also to render and to query local geodatasets on top of webmaps. Editing functionnalities are also available and JSON geometries are stored on a PostGIS geodatabase. A REST API has been developed in order to sent and call for the recorded geometries from the OpenLayers API client. The solution GUI is built using both XUL, XHTML/CSS and ExtJS API. This project was first designed as a prototype, and is now used by several hundred people.
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Web GIS: from Javascript to GWT

Author: Pieter De Graef
Abstract: This presentation will address the specific problems one encounters when programming thin client GIS applications. To be more precise, we will talk about browser compatibility issues, thin client vector technologies such as SVG and VML and then discuss a possible solution. My experience of working in a Javascript environment comes from working on the Geomajas open source project for 2 years. Geomajas is a client-server GIS framework built on top of the Dojo Ajax library, specialized in advanced editing and object-relation modeling. Working in a Javascript environment presents a difficult choice of technologies. What widget framework to use? What's the performance trade-off between vectors and rasters? Why can't we simply use Flex? This presentation will show all the choices we have made while creating the Geomajas framework, and why we've made them. Issues ranging from performance to development time, have contributed in the final choice to leave Javascript behind and make the switch to GWT.
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GeoPrisma : An Access Controlled Map Generator

Author: Julien-Samuel Lacroix and Stéphane Guillemette
Abstract: GeoPrisma provides controlled access to cartographic resources and allows custom (role-dependent) dynamic UI generation. An XML configuration file stores access control levels to any web service (WMS, TileCache, FeatureServer, etc.) at the layer level. Instead of implementing custom access control in every service available, communication with services is tunelled through a proxy so that they are effectively secured from direct access. GeoPrisma also provides a mechanism for adaptive UI generation. Each map element (widget, layer, etc.) is selectively included in the UI or not depending on the permissions associated with its corresponding role/resource/action triplet defined in an ACL, thereby allowing for the use of a single configuration file for all users in a project. The GeoPrisma client wraps the functionnality of the major FOSS JS libraries for mapping (OpenLayers, MapFish, GeoExt) and the proxy can be easily made to interact with any geodata server.
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GISVM+Xenia

Author: Jeremy Cothran
Abstract: GISVM http://gisvm.com is a vmware based virtualized image containing many popular open source tools. Xenia http://code.google.com/p/xenia/wiki/XeniaHome is the name of a minimal relational database schema and associated scripts for processing data to a variety of formats and services. Xenia has been developed in the ocean observing system domain to ingest data from a variety of fixed and mobile distributed platforms and observation types at the current rate of approximately 10,000 observations/hour and produce popular formats such as KML,GeoRSS and web services. Combining both a proven relational database observation collection schema with a variety of open source GIS mapping tools on the same virtualized image provides easy turnkey solutions to data management and sharing issues for distributed observation platforms and systems.

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Using cloud computing for high-availability large scale webmapping applications

Author: Claude Philipona
Abstract: Webmapping users expect now days modern Web-GIS applications with the latest Web 2.0 technology such as tiling, AJAX and they want to experience very fast applications, even during high load period. Cloud computing offers new opportunities to implement high-availability large scale applications. It is very use-full to address performance issues for high-demand period without having to invest on specific hardware. This presentation will first explain what is the new “Cloud computing” paradigm in the web technology and how it will change the way Webmapping will be implemented. We will then give an overview of the Amazon Web Services (AWS) and especially services related to cloud computing such as Amazon Elastic Compute Cloud (Amazon EC2), Amazon Simple Storage Service (Amazon S3), Amazon CloudFront. We will show not only how to run a web-mapping application in a cloud computing environment, but also how this kind of technology can be used for high-demanding tasks, such as tiles production. The second part of the presentation will show real-world case-study how to use cloud computing with web-mapping applications. Specific mapping issues will be addressed, such as tilecache management, ways to implement read-only and read/write applications. The presentation will also show how the use of amazon services can be implemented in a fully automated way, using Open Source software. It will show the implementation of a large scale Web-GIS application using MapFish, Opelayers, TileCache in a AWS environment (http://map.veloland.ch/?lang=en&p&route=all). It will also show how to manage a very high number of cluster instances using Puppet, an Open source automated deployment tool.

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MarineMap: Participatory Marine Protected Area Design Using a Web-Based Open Source Tool

Author: Chad Burt
Abstract: The California Marine Life Protection Act Initiative (MLPAI) is currently working toward establishing a network of Marine Protected Areas (MPAs) for the entire state. Since 2005, we have developed several web-based decision support tools for stakeholders to visualize and analyze geospatial information within California state waters. In 2008, we released a new web-based decision support tool , called MarineMap, for stakeholders to (a) visualize geospatial data layers, (b) draw prospective MPA boundaries with attributed information, (c) assemble prospective MPA boundaries into arrays, (d) share MPA boundaries and arrays with other users, (e) generate graphs and statistics to evaluate MPAs based on science-based guidelines, and (f) share results with users in a place-based discussion forum. Based on Open Source technologies (OpenLayers, GeoDjango, PostGIS, and others) the MarineMap decision support tool is freely distributed and modifiable under the BSD license for any area-based planning effort. We will demonstrate the major features of the tool and illustrate how it was used in the MLPAI. http://marinemap.org/marinemap/

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Enviro: a WebGIS interface to evaluate and manage the impact of climate change at regional scale

Author: Riccardo De Filippi
Abstract: ional scale. This work introduces an open source software infrastructure (the Enviro Platform) for research and decision-making aimed at evaluating the potential impact of climate change on the agricultural system of the region of Trentino. In particular, we focus on data, models and technologies facilitating the evaluation of potential vulnerability of the region to climate change, in order to find useful solutions. The Enviro Platform is developed within the Envirochange Project, an international multidisciplinary project funded by the Province of Trento (Italy), to investigate reproducible methodological approaches developed to evaluate the effects of climate change on food quality, pests and diseases in agriculture and their impact on farm revenue. The challenge for the Enviro Platform is to interface research models to geographical resources, experimental data, and climate scenarios. The aim is to provide a user-friendly and versatile WebGIS system for geodata processing and visualization. Moreover, the Enviro Platform is made available to different

classes of users, for both research and decision making purposes. The backbone of the system is based on a spatial-temporal Geodatabase (PostgreSQL and PostGIS). We adopted international standards and metadata profiles for geodata (Geography Markup Language, World Meteorological Organization and International Panel Climate Change) and Open Geospatial Consortium standards for data transmission and data processing (Web Map Service, Web Coverage Service, Web Processing Service). The platform gives access to regional time series of weather data, climate change scenarios and territorial geodata together with general statistical data using GeoServer as application engine. We have designed the Enviro Platform in order to ensure reproducibility of the evaluation process and to share the models used for testing, together with all the resources useful to track the life cycle of data and possible alternative models. Users can access, import, reproduce and document their numeric methods as defined by their respective mathematical formulations and incorporate them into the Environmental Models Catalog. The implementation of the catalog is based on standard markup languages, a common processing engine (Grass, R, PyWPS) and its purpose is to facilitate the comparison of different models and their usage on different spatial-temporal scales. In this presentation we will describe the design and the prototype implementation of the Enviro Platform, discussing the issues encountered in creating a framework where researchers and stakeholders can evaluate the impact of climate change using statistical analysis and geoprocessing methods.

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Images analysis improvement by variational segmentation in GRASS GIS

Author: Paolo Zatelli

Abstract: This work deals with the study of the variational approach to the image segmentation problem in GRASS GIS. Segmentation is the process of partitioning a domain into disjoint and homogeneous regions according to some criteria. These regions can be requested to be smoother than the original data, while the smoothing is restrained not to act on the boundaries of the segmented regions, thus preserving the main data features and making them easier to analyze. An original library and a new module for the GRASS GIS have been developed. Details on the underlying theory, the new algorithms, the development and the use of a new GRASS GIS module are given. The advantages provided by this new approach are assessed in practical applications, such as image classification and raster to vector conversion, with remarkable results. Practical evidence of the theoretically foreseen capabilities of the variational model is also given.

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Modern Historic Tours: Location Aware Services for the Heritage Tourism Industry

Author: Joseph Reeves

Abstract: Location aware services are becoming increasingly important within the heritage industry as a means of disseminating information to wider audiences based not on their proximity to a library, but based on their location within the real world. The growing ubiquity of GPS enabled smart-phones, online application market-places and always-on data packages provides a large potential market for the delivery of heritage based content via Free Open Source Software. Oxford Archaeology (UK) and ProDevelop SL (Espana) have collaborated to produce handheld guided tours for sale from online marketplaces. This partnership combines historical interpretations, new ideas concerning the presentation of this information and the required technology. Tourist tours of Medieval Oxford will provide the historic example for this presentation. The tour application is based upon gvSIG Mobile, but customised in both appearance and function to provide a integrated data set including historical mapping (served via WMS), POI lookup and location aware services such as audio playback. In this example, online content is mixed with locally cached material in a customised GIS application to provide a new utility to the user within which the distinction between application and content are blurred. The end result is a new form of tourist guide that provides a rich dataset to the user, queried by their location and providing an engaging interaction with the past.

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Quality Control of Digital Elevation Models

Author: Thomas Knudsen

Abstract: Accurate digital elevation models (DEMs) are crucial for assessment of (and preparation for) the consequences of the expected sea level rise, due to climate changes. In coastal areas of low slope, the accuracy requirements are especially high, since a small height displacement will correspond to a large horizontal translation. In order to obtain the required accuracy, raw airborne laser scanner height data (the "point cloud") must be adjusted to a set of known points, and data from overlapping flight strips must be adjusted to fit each other. This "strip adjustment" is carried out in a highly non-linear fitting procedure, involving a complex combination of GPS data for positioning, inertial navigation data for instrument attitude, laser scanned height data, and individually surveyed ground control points, for the height adjustment. In this presentation, we present the PINGPONG program (FOSS distributed under the GPL), and describe how it has been used to implement a strip adjustment quality control procedure in a way, which is entirely independent of the navigational data and ground control points. Fundamentally, PINGPONG is a high speed gridding program for scattered

geodata. It uses a simple, but efficient, data management technique to speed up the gridding procedure. The speed of PINGPONG makes it feasible to include a large amount of gridding in our quality control procedure, even for national scale datasets (in our case involving in the order of 20 billion data points), so the procedure is based on analysis of the local difference of a digital surface model, and a digital terrain model. Effectively, this means that we are generating two interim elevation models in order to test one point cloud for its suitability for generating a final model. While this may seem somewhat extravagant, experience shows that it is actually both useful and efficient.

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expert systems: the improvement in the accuracy of direct georeferencing

Author: Daniel ODOnohue

Abstract: Direct georeferencing of aerial imagery has the potential to create vast amounts of detailed geographic data. However, difficulties in automatically relating imaged features to existing geospatial objects such as buildings arise due to the limited spatial accuracy of aerial imagery. Manual assessment and correction of georeferenced imagery is possible given small data sets but soon becomes impractical with large quanties of data. A methodology for automating the correction of directly georeferenced thermal imagery using existing spatial data of buildings is presented. Open source geospatial libraries are utilized into an expert system using the Python programming language. The system extracts image features and compares the geometric attributes of each feature with the attributes of existing spatial representations of buildings. Successful matching of image features with buildings objects allows the spatial accuracy of each image to be assessed and updated where necessary.

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Open Web Processing Services for Improving Accuracy of GPS tracks using Filtering and Map-Matching

Author: Venkatesh Raghavan

Abstract: Authors: Xianfeng SONG, Daisuke Yoshida and Venkatesh Raghavan Abstract: This paper presents open geo-processing services to support co-registering the vehicle GPS traces with road network, based on open GIS standards and open source geospatial software. An integrated approach is proposed to glue open source geospatial software to provide Web Services for enhancement of GPS tracks. Map matching algorithms for vehicle tracking data are implemented using the PyWPS interface. Track-logs are stored in the PostgreSQL/PostGIS enabling handling of large volume data of road network, and the Openlayers client is used to visualize the processing results. As a part of the core processes of map matching in PyWPS, specific filters of GPS tracks, related to vehicle motion characteristics, are first applied to produce high quality vehicle trajectories. Secondly, advanced curve-to-curve distance measurement algorithms – Hausdorff distance and Frechet distance are implemented in Python to perform map matching of road network. The system has been tested under dense urban road network conditions in Osaka City in Japan. The results of the experiments suggest that the Web Services are effective for retrieval of the paths from urban street network and accurate matching of tracking data form low-cost GPS tracking devices. The services implemented as a part of this research will be not only useful for vehicle tracking but also for automated update of road network and in improving quality of community driven geo-data collection initiatives such as the Open Street Map.

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Mixing Open Source GIS with Microsoft Technologies

Author: Pete Smith

Abstract: Many organisations have Microsoft technologies listed in their strategic IT infrastructure and architecture standards. This presentation explores the options for integrating and leveraging FOSS in such an environment.

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Drift-X WPS: An atmopsheric dispersion simulation Web-GIS platform

Author: Venkatesh Raghavan

Abstract: Authors Nicolas Bozon, University of Montpellier 2 (FR) Venkatesh Raghavan, Osaka City University (JP) Bijan Mohammadi, University of Montpellier 2 (FR) Our past research treated the problem of integrating Drift-X, a Gaussian based atmospheric dispersion model within a desktop GIS framework. A dedicated pesticide spray drift model was iimplemeted within Quantum GIS using its Python bindings capabilities and the results are presented at FOSS4G2008. The present work aims to adapt this model to Web-GIS platform using a WPS architecture. Web based geoprocessing is aimed in order to automate the model setup and to perform on-line simulations. The main idea is to create a WPS compliant service that can respond with XML document to the Getcapabilities, DescribeProcess and ExecProcess

requests sent from the client browser. Input parameters needed by the model (namely a DEM layer and an input data file containing extent for calculation and point based information) are sent to the WPS server from an OpenLayers client. subsequently, the Drift-X WPS module processes the DEM layer as per the the given extent, deliver it to the model with the other user-defined parameters, run the model and then send the results to a WMS MapServer installation in a standard GIS format. The results arel be finally tiled by MapServer and potrayed within the OpenLayers client. The present Web-GIS implementation will be useful for better agricultural practices by minimizing pesitiside use. Further, the Web-GIS geoprocessing platform implemented in this research could be enhanced with Sensor Network functionality to support precision farming.

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Web Processing Services for Remote Sensing Data in a Grid Environment – The SARoNGS Project

Author: Kamie Kitmitto

Abstract: Kamie Kitmitto1 , Amer Alroichdi 1, Andrew Rowley1, Anja Le Blanc1, Gail Millin1, James Schumm1, Mike Jones1 1The University of Manchester, Mimas, Oxford Rd. Manchester M13 9Pl Contact details 0044 161 275 6099; kamie.kitmitto@manchester.ac.uk The amount of remote sensing data being collected using satellite sensors and airborne sensor is groing exponentially. The interest in the processing of this data and the derived value added products is also increasing. The usual approach of individuals and groups processing data on their desk top has long been established. However, Researchers are becoming more aware of the need to look for phenomenon across many images in space and over time. The normal desktop processing does not address these emerging requirement. There is a deficiency in computing power that a grid environment can address. However image processing algorithms are not in place to address these requirements in a Grid/ High Performance Computing environment. The Shibboleth Access to Resources on National Grid Service, (SARoNGS) project first objective was to make access to Grid Resources more accessible to Academic users in the UK through the removal of the Authentication-Authorisation hurdle. Access to Remote sensing data and processing workflows for the grid was the demonstrator service that was chosen as a proof of concept. In addressing these two issues Sarongs will remove two major hurdles for wide spread access and utilisation of Grid resources and Remote Sensing data .The National Grid Service (NGS) is one of the UK grids, with access to more than 2000 CPUs of High Performance Computing resources. The NGS offers the UK academic community access to these facilities, many of which are free at the point of use. The SARoNGS project outputs allows users to securely login and use grid resources using their university's central user name and password obviating the need for complex grid credentials (Grid Certificates). The Landmap service provides web access to download Remote sensing data primarily focused on the UK, Landsat, Spot, Envisat ASAR, ERS SAR, and DEM from 90m to 1 m resolution of the UK. The web access is done utilising WCS OGC protocols generated by Erdas Appolo Image Manager (EAIM). The Landmap Service has been working on implementing the open-source 52north Web Processing Service (WPS) to utilise the WCS outputs from EAIM in a grid Environment Utilising the SARoNGS authentication. The WPS uses the Sextante algorithms library which contains more than 230 algorithms for raster and vector data. This paper, will describe our experiences and the current status of the project.

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A "no-frills", modular, work systems approach to selecting decision support software tools

Author: Frank Kizito

Abstract: Decision Support Systems (DSS) may be described as computerized tools that an organization utilizes to enhance its decision-making activities. Studies have shown that although DSS offer many benefits, they have not been widely taken up in practice. Reasons advanced include the "black-box" nature of some tools; the proprietary nature and cost of acquisition and maintenance of tools; inappropriateness and irrelevance to "real" decision contexts; a mismatch between tools and problem solving styles; and mistrust of DSS outputs due to a lack of understanding of the underlying processes. In many respects, the Free and Open Source Software (FOSS) movement is an attempt to address some of these limitations. When faced with making a choice amongst potential FOSS solutions, however, questions that are commonly considered include: "Can the FOSS product match its proprietary counterparts in terms of functionality, ease of use, quality of outputs, etc?" Correspondingly, a number of choice frameworks have been proposed in the past based on comparisons of functionalities and limitations of various tools. This paper advocates for a shift from this "functionality-driven" approach to a work systems approach, when it comes to development of organizational DSS. This is because, regardless of whether DSS capabilities emphasize better data availability, analysis, modeling or presentation, these capabilities have little or no impact until they are adopted and incorporated into work systems within organizations. Using a case study of an urban water utility in Uganda, the paper documents the application of a bottom-up process of business mapping and workflow analysis, and demonstrates how this would translate into the selection of the most appropriate building blocks for a modular DSS solution tailored to the prevailing local needs. In this respect the choice of FOSS components for the DSS, rather than being simply a replacement for their proprietary "white elephant"

counterparts, would focus on taking advantage of the access to source code that FOSS solutions offer to build lean, efficient solutions that more closely match identified user needs.

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Free and Open Source Software in a Nutshell

Author: Arnulf Christl

Abstract: This presentation introduces to the general concepts of Free and Open Source software and the special aspects of licensing, related business models and how to integrate them with professional use.

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Case Study: Pollutant Release and Transfer Registry

Author: Arnulf Christl

Abstract: The German Environmental Agency has implemented a geo portal application to meet the European Union regulation for a Pollutant Release and Transfer Registry (PRTR). It is based completely on Open Source software running Debian, Postgres and the OSGeo SDI stack with PostGIS, MapServer, Apache and Mapbender. The background maps have been created from OpenStreetMap data. The data has been generalized and processed to meet the performance needs of the application. Maps are rendered using MapServer and served through the OGC WMS standard. The application meets the European INSPIRE directive and PRTR. Many SDIs and geoportal applications operated by the German government already rely completely on Free and Open Source Software. On top of this the PRTR portal uses now also uses freely available community crowd based spatial data as background maps.

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GeoServer in Production

Author: Andrea Aime

Abstract: Putting a web gis server in production requires a dedicated effort to ensure consistent performance, stability and scalability. This presentation will explore the common task of setting up a GeoServer instance for production and tuning the components to ensure proper allocation of resources. Scaling the solution with a cluster, and tips on keeping staging and production instances synchronized, will also be discussed.

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OSGeo - Globally Powering SDIs

Author: Arnulf Christl

Abstract: This presentation gives an insight to the Open Source Geospatial Foundation. The Open Source Geospatial Foundation (OSGeo) is an international non-profit organization dedicated to the advancement of open source geospatial software, community collaboration and spatial data access. OSGeo is a community of communities reaching into all areas of interest to the global spatial infrastructure. Millions of end users and web developers unknowingly use Open Source Geospatial software in a daily manner. The investment into the core software goes into the tens of millions of US $. Several 10 thousand GIS professionals use Open Source geospatial software an a daily basis. Thousands of active members in more than 40 local chapter initiatives continuously build the global OSGeo community. Activities can be grouped into three areas: * Software Projects * Spatial Data Projects * Education and Research In order to be able to provide a reliable technical infrastructure and protect its software projects OSGeo has a legal body. It is a non-profit organization incorporated in Delaware, USA and is supported by 73 individual charter members from 20 nations. These vote for the board of directors who in turn employ the CEO. This way an organization has been created that can also take on copyright ownership for code. OSGeo operates and maintains development environments for its software projects with code repositories, tracking systems, mailing lists, web sites, wikis, build bots, download space and so on. To be able to focus its efforts on viable projects these are first vetted by the incubation process. Any geospatial Open Source project can apply for incubation by submitting an application form. During incubation several aspects of the project and its governance are evaluated. Many of these processes have been gleaned from larger organizations like the Apache Foundation, for example the code provenance review that each project has to go through or the list of accepted licenses that comes from the Open Source Initiative. Projects are expected to provide well documented working code and documentation as well as a functioning community and communication infrastructure. OSGeo provides for a forum of users, service and data providers and developers. It cooperates with existing communities from all realms rather than trying to do all on its own. One example is the memorandum of understanding between OGC and OSGeo allowing for quicker development and deployment of standards and leveraging OGC's integration potential with proprietary software vendors. One issue that is of mutual interest to all communities is the availability of spatial data justifying a meta level

project of its own, the Geospatial Data Committee. Initially thought to become a place where to upload global spatial data it quickly became evident that this would not make much sense due to the great amount of data and the need for a high frequency of updates. Other issues were also found to be much more pressing, for example the need for a clear policy on copyright and licensing and usage of spatial data and most of all a usable meta data policy and repository of resources. In summary OSGeo has developed into a natural global repository of spatial data services, providers and users.

Rate the workshop

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The Definition of Open in OGC, OSGeo, and OpenStreetMap

Author: Arnulf Christl

Abstract: This presentation gives an insight to the industry consortium OGC, the foundation OSGeo and the project OpenStreetMap. Each of three geospatial meta communities carry the term Open in their name but with different definitions. To understand how they can be put to use and recognize value it is necessary to learn where they come from and understand their different inner workings.

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Open source geospatial Business Intelligence in action with GeoMondrian and Spatialytics!

Author: Dr. Thierry Badard

Abstract: Geospatial Business Intelligence (BI), combining GIS and BI technologies, has recently stirred marked interest for the huge potential of combining spatial analysis and map visualization with proven BI tools and techniques such as data warehousing, Online Analytical Processing (OLAP), ... In this perspective, the GeoSOA Research Group at Laval University started to integrate geospatial functionality in existing open source BI software. It results in the release of GeoMondrian, a Spatial OLAP (SOLAP) server which extends the Mondrian OLAP server with GIS data types and functions. On the client side, Spatialytics has been developed and provides a client visualization component for Spatial OLAP data, using GeoMondrian as a data source and OpenLayers as the web mapping front-end. It enables the creation of drillable, interactive thematic maps based on multidimensional OLAP cubes and aims at producing interactive geo-analytical dashboards. This talk will present and demo both Spatialytics and GeoMondrian open source projects.

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GeoKettle: A powerful open source spatial ETL tool

Author: Dr. Thierry Badard

Abstract: Geospatial Business Intelligence (BI) tools (geo-analytical dashboards, reporting and Spatial OLAP) present to users summarized data from operational systems in interactive maps, charts, graphs and reports. They allow decision-makers to analyze data in order to make better decisions. They rely on data warehouses which organise geo-analytical data according to dedicated data structures (e.g. star schemas). They enable a fast navigation in large data volumes in order to not hinder the analysis process flow. Some spatial ETL (Extract, Transform and Load) tools are used to build such data warehouses. GeoKettle (http://www.geokettle.org) a spatially-enabled version of Pentaho Data Integration (Kettle) is a powerful, metadata-driven spatial ETL tool dedicated to the integration of different spatial data sources for building/updating data warehouses. It is part of the open source geospatial BI software stack designed by the GeoSOA research group at Laval University. This talk will present how GeoKettle works and its different features.

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ebRIM interface for GeoNetwork OpenSource

Author: Heikki Doeleman

Abstract: We propose to hold a talk on the new EbXML interface to the GeoNetwork OpenSource catalog. This work has been commissioned by the European Space Agency and is set to become part of a future GeoNetwork 3.0 release. We will highlight the various OGC specifications involved in this effort, such as OGC 110r2 - "ebRIM profile of CSW", OGC 07-144r2 "Basic Extension Package", and OGC 07-038 - "Cataloguing ISO metadata using the ebRIM profile of CSW". We will discuss about the architecture and implementation of the EbRim interface in GeoNetwork, what is supported and what are the limitations and, time permitting, talk a little about the direction of GeoNetwork in terms of software architecture.

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GeoServer: Past, Present, and Future

Author: Justin Deoliveira
Abstract: 2009 has proven to be another interesting year for the GeoServer project. GeoServer has continued to evolve in terms of exciting new features, stability, and performance. This presentation will provide a “year in review” describing some of the new and noteworthy of this past year. As well as provide a general overview of GeoServer and the features it provides. The coming of GeoServer 2.0 brings some major new features to the table such as the new web administration interface and configuration systems. Along with a heap of others including a RESTful configuration api, advanced labeling and rendering improvements, and layer level security just to name a few. This presentation will close with a sneak peak of what the future holds for GeoServer, and a look at the new features and improvements currently being worked on by the GeoServer developer community. So if you are an expert GeoServer user, or just a novice trying to figure out if GeoServer is right for you, this talk is for you.
Rate the workshop
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Beyond "press Ctrl-P" in web map printing

Author: Jan De Moerloose
Abstract: The situation is quite familiar for many end users: on-line maps provide a tremendous choice in flexibility when it comes to navigation or even manipulating your own data. But when it comes to making a print, people are left with the all too common "use your browser's built-in print function" advice, leading to unsightly prints that may be sufficient for the occasional trip to the coast, but are far from the professional looking prints you used to achieve with your favorite thick client viewer. We would like to present a novel approach to web map printing based on a component-based template for the print that can be both visualized and manipulated by the end user. Powerpoint-like flexibility is available to the user in positioning, resizing and customizing components like maps, legends, text labels, images, view ports, etc.. Finished templates can be sent to the server for rendering in PDF (using the wonderful iText library) and saved for later reuse.
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Development of User Friendly MMPS(MODIS Monitoring Processing System) Prototype

Author: SeungYub Kim
Abstract: MODIS(Moderate Resolution Imaging Spectro Radiometer) satellite imagery is at the last development stage and widely used in the scientific and environmental areas. In this study, development of user friendly MMPS (MODIS Monitoring Processing System) Prototype will be discussed that is designed and implemented for the MODIS processing automation and viewing in Microsoft Windows environment. Developed modules are able to produce MODIS data automatically from raw data(Level 0) to initial data(Level 1)'s level for preprocessing jobs of MODIS satellite imagery and land monitoring. Additionally some analytical processing technology(Level 2) were also implemented. The image viewer using GDAL/OGR library is developed for viewing MODIS data and displaying the results of analysis. To implement this system, major parts of IMAPP(NASA’s opens source MODIS modules run in Unix / Linux-based console environment) was ported to the Microsoft Windows-based GUI environment. The implemented system is expected to be used to produce & view MODIS data in Microsoft Windows environment effectively and easily. Also it is expected that this system can help users and scientists who want to produce and analyze the data of MODIS satellite imagery with multiple aspects.
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Behind the buzz of cloud computing- 52North Open Source Geoprocessing Software in the Google Cloud

Author: Bastian Schaeffer
Abstract: Mainstream IT providers such as IBM, Amazon and Google have already started to provide large computational and storage facilities to third parties in an on demand and scalable fashion-also known as cloud computing. The presentation will elaborate what is behind the buzz word of cloud computing in regard to open source geospatial applications. In detail, the combination of the 52North Open Source Web Processing Service in the Google Cloud will be presented to show that cloud computing is more than marketing. Scalability as one of the core propositions of cloud computing will be tested in the Google Cloud in the context of a real world scenario.
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Metadata of spatial data quality: a proposal to report the positional accuracy element

Author: Maria Antonia Brovelli
Abstract: The accessing and sharing of high quality and updated geographic information (GI) plays an important role in various challenges of contemporary society. Ideally it should be easy to discover available GI, verify its fitness for the purpose, accessing and integrating it with other spatial data. However, the current situation (at least) in Europe is characterized by a set of problems that make difficult to really identify and use the growing availability of heterogeneous spatial data managed at different levels. To this purpose, in 2007 the INSPIRE Directive of the European Parliament and of the Council entered into force to trigger the creation of a European Spatial Data Infrastructure (ESDI). In the ESDI, spatial data are described using metadata that provide information supporting their discovery and evaluation. Quality of spatial data reported in detail in metadata could help users to make more correct evaluation about data suitability for their needs and their intended application. Users don't need just data but data adequate to their purposes. Objectives of the research here presented are addressed in the ESDI and INSPIRE framework. In particular we consider the definition of spatial data quality and its description through metadata as an essential task for the implementation of an SDI, whereas current INSPIRE recommendations for metadata specifications have not clearly identified data quality as a major issue. Moreover our interest concentrated on positional accuracy, which is one aspect we have studied for many years. With respect to the spatial accuracy characterization, metadata have to be considered poor and inadequate: some needed fields are missing; the semantics of the recommended fields is ambiguous; they do not consider nor manage quality intended as positional accuracy. Therefore, a main objective of the research was to establish how the spatial data quality can be communicated, suggesting possible solutions that take into account: spatial metadata standards, specific indicators and statistical measures, and different approaches from data producers and data users. As told, the focus is on the quantitative aspect of data quality that is related to their positional and metric characteristics. To reach this objective it was necessary to recognize how spatial positional accuracy can be assessed considering data production process, products specifications and the experience coming from experts in data processing. The study of assessing positional accuracy resulted in the proposal of new fundamental metadata fields to report positional accuracy element. This novel set of information enhances elements included in the current INSPIRE recommendations for metadata. The metadata elements proposed will be illustrated in some particular and outstanding examples of geographic data products, i.e. elevation models coming from LiDAR data and satellite images characterized by different spatial resolutions.
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Challenges and possibilities of Mobile GIS : perspective from a developing country

Author: Nimalika
Abstract: Mobile phone is the most commonly used electronic device around the world. Unlike many other appliances mobile phones are extremely popular and used to link communities in developing countries as well. But geo-enabled services on mobile devices are not well accepted in these contexts yet, opposed to the situation in many developed counties. This study attempts to investigate limitations related to providing GIS services, related to the technological frameworks and services which would be useful to general public, in current context of a developing country. The opportunities for providing socially useful geo-enabled services while accepting the limitations of technological and economical factors in local contexts are explored. The possibility and the suitability of integrating FOSS GIS frameworks with device independent mobile computing is explored. Important roles of mobile web for mobile GIS ,applicability of OGC standards and value of interoperability in mobile GIS is highlighted. The study is based on the experience in Sri Lanka, related to adopting FOSS based approaches in web and mobile GIS.
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Investment Attraction Support System using OpenSource Application

Author: KwangSeop, Song
Abstract: This paper is about supporting system of regional development and promoting investment by using OpenSource Application. The Law, Cultural assets, Environment are most significant issues to be considered when investors develops a certain region. This system data contents built by informations of law, cultural assets, environment and all the plans of JeonNam local province. On this system, the minimal spatial unit of information was parcel of land. All the informations of JeonNam local province were provided by this system. This system enable the investors to query, search, print all information about the lands for investment on their fingertips and help investor to make a decision about the land suitablity. This system built by MapServer servicing map image, PostGIS searching and processing spatial data, postgreSQL querying and searching database, commercial image server servicing high resolution airphoto and satellite image, flash client application embedded in web browser.
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GISVM, the ultimate tool for teaching FOSS4G

Author: Ricardo Miguel Moreira de Pinho
Abstract: GIS Virtual Machine is a new concept of FOSS4G distribution, based on Virtualization technology, which enables it to be a completely installed, configured and ready to use GIS Workstation. And, as a Virtual Machine, it can literally run anywhere. GISVM is a full-feature GIS Workstation based exclusively on free GIS software: PostgreSQL, PostGIS, GeoServer, Mapserver, FWTools, QGIS, GRASS, gvSIG, uDIG, Kosmo and OpenJump, on Ubuntu Desktop. As such it offers the growing number of professionals and general users, who need to perform any kind of GIS task, an opportunity to quickly and painlessly start using FOSS4G on their current computer environment. A case study will be presented on using GISVM at university training, for teaching “ecological modeling and spatial data analysis”, aimed at Master and Doctoral level students in different Universities. It demonstrates how it can be used with excellent results in the framework of teaching purposes.
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MapServer Project Status Report

Author: Daniel Morissette and Jeff McKenna
Abstract: This session starts with a status report of the MapServer project, followed by an open question/answer session to give a chance to users to interact with members of the MapServer project team. We will go over the main features and enhancements made to the software in the last year, the current and future direction of the project, the organization of the project and the role of the Project Steering Committee (PSC), and finally discuss contribution opportunities for interested developers and users. Don't miss this chance to meet and chat with the members of the MapServer project team!
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Oracle Spatial GeoRaster

Author: ilucena
Abstract: Present the GDAL driver for Oracle Spatial Georaster - How the GeoRaster driver can be used (eg. from MapServer, QGIS, GDAL command line tools, etc) - A comparison of the GDAL and GeoRaster data models (differences and how things are mapped) - A discussion of GeoRaster performance, with comparison to plain GeoTIFFs.
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Summary of MapServer OGC Web Services

Author: Jeff McKenna
Abstract: Interoperability is increasingly becoming a focus point for organizations that distribute and share data over the Internet. The Open Geospatial Consortium (OGC) focuses on the development of publicly available geospatial web standards. MapServer currently supports numerous OGC specifications, allowing users to publish their data services in an interoperable manner. This discussion will review the OGC specfications supported in MapServer as well as provide information on implementation options and issues, as well as what the future holds for OGC support in MapServer.
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Anatomy of a digital field mapping with BeeGIS

Author: Andrea Antonello,Silvia Franceschi,Mauro Dedonatis
Abstract: BeeGIS is an open source GIS software for field mapping conceived for pen computer. This software was create to be efficiently and friendly used during digital field data capture by professionals (mainly geologists and engineers), it wants to drastically reduce the loss of information and times fully supporting data acquisition, sharing and transferring. Enhancements on the already tested GPS tool, the geonotes and the annotation tools were made as well as several new tools were created, as for example: * the fieldbook: this tool allows to organise geonotes properly, access them quickly and save them to and load them from disk. * the photo sync: the tool allows to geotag a picture in its right shutting position by synching date and time between picture and GPS. This presentation shows all new and old digital field mapping tools contained in BeeGIS by means of a step by step description of a sample mapping excursion, lead by a team of two people armed with a tablet pc and an android based smartphone. authors: Andrea Antonello, Silvia Franceschi, De Donatis Mauro, Susini Sara
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JGrass, present and future

Author: Andrea Antonello,Silvia Franceschi,Riccardo Rigon
Abstract: Since its merge with the uDig community the JGrass team had a hard time to migrate all of its most important components into the new framework. After two years the move has proved to be well chosen. Not only the existing modules were enhanced, but also possibilities were created for large scale customizations for complex water household projects for pubblic administrations. This presentation will first introduce the current state of the JGrass project and its tools: * the openmi modeling system * the console scripting engine * new geomophological tools * new complex models It will then describe the ongoing efforts like for example: * support for tiled reading and writing of GRASS raster maps to solve memory issues * browsing tools for the embedded and remote database instance * jiffle support for the new mapcalc * grass rasters and nasa worldwind As a separated part also the new JGrass manuals will be presented. The presentation is status report for the JGrass project, focused on describing both the current state and the most important future enhancements. authors: Andrea Antonello, Silvia Franceschi, Riccardo Rigon
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JGrass-uDig's sense of climate change

Author: Silvia Franceschi,Andrea Antonello,Riccardo Rigon
Abstract: This presentation guides the user through a collection of tools for hydro-geomorpohologic and climate analysis. These tools are contained in the JGrass spatial analysis toolbox extentions for uDig and known as the Horton Machine. Among other things the maximum discharge Peakflow model, the full hydrological model Newage, the SaintGeo propagation model and the soil stability Shalstab model will be presented. The steps by step description will consider: - definition of an environmental scenario - data collection: extraction of the main terrain attributes from the DEM (slopes, gradients, curvatures, contributing areas, as well as the river network and the hillslopes map). - preparation for the models: data analysis, validation and interpolation (precipitation, temperature, air pressure, wind speed and soil moisture). - modeling: connection of the collected data to the attributes of the territory. Use of hydrological models to calculate environmental attributes on the extracted watershed. - discussion of the obtained results: with focus on the evolution of the water flow and the snow coverage, considering the soil interaction with precipitation, temperatures and other meteorological quantities. AUTHORS: Silvia Franceschi, Andrea Antonello, Riccardo Rigon
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Integrating dendrochronology and FOSS4G to evaluate natural hazards

Author: Marco Ciolli
Abstract: Avalanches and Debris flow can be effectively studied using dendrochronological techniques which allow the reconstruction of spatial and temporal pattern and paths of occurred phenomena. Sometimes it is also possible to reconstruct the volumes of the debris or of the avalanches which have been moved in the phenomena. These reconstruction are particularly important for the areas which are more exposed to the direct risks of avalanches and debris flow in order to prevent new phenomena in a changing climate. FOSS4G is the ideal platform where to integrate dendrochronological techniques and spatial modeling and representation of these phenomena including the reconstruction of paths and volumes. Different alpine study cases in which FOSS4G has been successfully applied to study, model and represent avalanche and debris flow phenomena are presented. Advantages in the use of FOSS4G are highlighted.
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Tools for wildlife data management: evaluation of kilometric indexes of abundance

Author: Clara Tattoni
Abstract: Index of Kilometric Abundance is a common measure used in wildlife studies because it allows a straightforward comparison of species abundance in different sites or at different times. IKA expresses the ratio of the total number of individuals (or of signs of presence) observed along a transect by the number of km covered at each site. A new tool for GRASS, v.transect.KIA, has been developed for automating the evaluation of IKA according to one environmental variable (typically habitat type). This script splits the transects according to a vector map, calculates IKA using a point map of sightings and saves the results in the attribute table. It uses a DTM to evaluate the 3D length and preserves the original attribute table. The output of v.transect.KIA is useful to understand the distribution of a species according to the environment. The module has been tested on field data from Northern Italy for the mountain hare (Lepus timidus), allowing a first wide-area estimate.
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Collaborative Web-Based Mapping of Real-Time Sensor Data

Author: Cristian Gadea
Abstract: Google Maps is an example of how Web 2.0 technology such as AJAX can be used to create online map services that are easy to access, user-friendly and fast. Thanks to flexible web-based mapping APIs, it is now possible for non-experts to plot and distribute GIS (Geographic Information System) data to a large audience. For example, users can view ``mashups'' of geographical data such as housing information from the website Craigslist plotted on a Google Map. Most data plotted so far, however, has been relatively static. In addition, the typical webpage layout has severely limited the interaction possibilities for online maps. This paper will discuss how real-time sensor data can be displayed on the web, requiring users to have nothing more than a standard web browser to gain access to that data. By using micro brokers and the Java Message Service (JMS), we show how real-time data can be made available on web browsers found on a variety of devices (including popular mobile phones) for true ``anywhere access'' to GIS data. We then show how this data can be annotated and analyzed in a collaborative fashion where changes to the map are instantly synchronized to all interested parties (such as friends in a social network). Finally, we show how the system supports plotting a wide variety of real-time data by using the OpenLayers library from the Open Source Geospatial Foundation (OSGeo) for displaying maps and the open-source JFreeCharts library for rendering visualizations such as dials. Sources for real-time data used include live vehicle tracking data (GPS location), aircraft data, and any sensor data that conforms to the Sensor Observation Service (SOS) standard from the Open Geospatial Consortium (OGC). SOS data is processed by integrating open-source components from 52North. By using the latest web-based technology from open-source projects like OpenLayers along with open standards like SOS, this paper shows how maps and GIS data can be made more accessible, more collaborative and generally more useful.
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Development of Satellite Information Management System (SIMS)

Author: Shinsuke Kodama
Abstract: We developed a web portal for searching satellite imagery using FOSS4G.
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Yukon Planning Atlas - Building regional capacity for land and resource management

Author: Jeff Hamm
Abstract: Production of data products occurs at various stages of regional land use planning processes, most commonly in analog formats of text, maps, tables and photographs. Distribution is often limited an local, due to the high cost of reproduction of color maps and images. By developing workflows that also prepare and manage data for distribution as web map services, a subset of the regional planning database can be published to a broader community. The FOSS4G framework can then be used to lever this data, providing the interoperability necessary for multi-agency resource management. The adoption of Open Source technologies may also help reduce costs for capacity building. The Yukon Planning Atlas is a Mapserver/Chameleon application developed to distribute ecological, cultural and economic data assembled for production of land use plans following settlement of aboriginal land claims. Training in the use of the application is provided to build capacity in knowledge management with First Nation and government land and resource officers. This presentation will review the process for developing an Open Source application, describe the workplan for preparing and publishing WMS data, and demonstrate the use of a FOSS4G application.
Rate the workshop
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MapWindow 6.0: An Extensible Architecture for Cartographic Symbology

Author: Harold Dunsford
Abstract: A robust, extensible architecture is critical to open source projects that have a distributed developer and user base. The MapWindow 6.0 project is using a new architectural paradigm where extensibility is handled from several different plug-in points, rather than a single, application wide design. This allows new kinds of extensibility to be explored such as tools and data providers in addition to the more conventional application wide extensibility. This presentation outlines some of the improvements in the built in cartography, but primarily addresses the .Net architectural decisions that permit run-time discovery of new kinds of custom symbology. Improvements include layering of different kinds of symbols to make a compound symbol as well as establishing cartographic sub-categories based on vector attributes or raster values. The open ended framework allows for an extremely flexible system of run-time discovery so that the core libraries do not have to be recompiled each time an external cartographic improvement is developed.
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HIS Desktop: A CUAHSI Application for the Consumption of Spatio-Temporal Web Services

Author: Daniel P. Ames
Abstract: The U.S. National Science Foundation supported Consortium of Universities for the Advancement of Hydrologic Sciences (CUAHSI) Hydrologic Information System (HIS) includes extensive development of data storage and delivery tools and standards including WaterML (a language for sharing hydrologic data sets via web services); and HIS Server (a software tool set for delivering WaterML from a server). This presentation describes the development of a new HIS software tool called “HIS Desktop” and the development of an online open source software development community to update and maintain the software. HIS Desktop was envisioned as a local (i.e. not server-based) client side software tool that ultimately will run on multiple operating systems and will provide a highly usable level of access to HIS services. The software will provide many key capabilities including data query, map-based visualization, data download, local data maintenance, editing, graphing, data export to selected model-specific data formats, linkage with integrated modeling systems such as OpenMI, and potentially upload to the HIS server from the local desktop software.
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A Modular Spatial-Temporal Modeling Environment for GIS

Author: Brian Marchionni
Abstract: Development of an open source modeling environment for use with spatial-temporal data in a Geographic Information System (GIS) is presented. To date, legacy versions of MapWindow have lacked an integrated modeling environment suitable for linking together independent geospatial and temporal processes at a granular level. This new modeling environment allows users to easily create models which can take advantage of spatial and temporal data objects and analytical tools. The design approach focuses on an ITool interface that serves as an independent point for the run-time discovery of geoprocessing extensions. The user interface is automatically generated by the modeler when their tool is instantiated based on parameter characteristics on the ITool interface. The design is also versatile, allowing processes to also be run through a more traditional method of adding a reference and calling the processes as functions programatically.
Rate the workshop
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The Use of Open Geospatial software in SOPAC for Data Cataloging

Author: Keleni Raqisia
Abstract: Since the establishment of the Pacific Applied Geoscience Commisiion (SOPAC) in 1972, the SOPAC OIP Programme has been involved in geophysical, bathymetric, marine and coastal surveying and mapping using various techniques across the Pacific Islands region. The data collected from over 30 years of surveys has been carefully recorded but now are on a risk of been lost. GEONETWORK an online searchable digital library is now been implemented to facilitate the systematic and concerted effort to rescue this data and create a more structured system for storing and documenting these vital datasets and also facilitate the security, accessibility and sharing of geographically referenced thematic information. Among these efforts the SOPAC Geonetwork team also supports capacity building and improved knowledge and expertise of open source spatial software such as Quantum GIS and Grass GIS. Such platforms have been used in the conversion of older data formats before cataloguing on the SOPAC GEONETWORK. GEONETWORK now holds a range of data from regional bathymetry, coastal topography datasets, technical reports, seismic data,map products, marine physio-chemical datasets, maritime boundary Information, sea level data, regional marine scientific research cruise information and data, satellite imagery and scanned aerial photography. The use of open source software is seen as an important step in maintaining a sustainable level of regional interest and use of such data, since proprietary software is expensive for Pacific Island countries to purchase and maintain.
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In the passage of time - EcoHistory - a celebration of 100 years of Queensland National Parks (2008)

Author: Paul Pfeiffer and Shaun Kolomeitz
Abstract: In 2008 Queensland celebrated its "Centenary of Parks" with a number of key events across the state. One of the components of the celebration was presenting how a number of key/iconic Parks across the state have evolved over time. In order to do this BAS developed an application called "EcoHistory". The Spatial Services team researched all the historical information, collecting Gazettal details for the iconic Parks, while BAS provided the application to visually present the data. BAS looked into a number of technologies for providing the presentation but by far the most cost effective and robust was to use a full open source solution. This resulted in a multi-framed web based application, using

PHP and postgresql/postgis at the backend as well as a combination of Javascript and SVG frames within the web browser. The application provides a tree like history chart, incorporating animation in a map, with the ability to select particular date ranges and stop/pause as well as hyperlink to other key Agency systems. Although the system is visually complex on initial viewing, EcoHistory has received acclaim where ever it has been presented and has provided staff with a fast, easy to access visual history of iconic National Parks within QPWS.

Rate the workshop

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