

# GETTING STARTED WITH MAPSERVER

Jeff McKenna, Pericles Nacionales and Tyler Mitchell

## ABSTRACT

This hands on workshop is intended as an introduction to Web mapping with the University of Minnesota MapServer. The participants will go through the process of setting up a MapServer environment which includes configuring a Web server and creating a MapServer application. The creation of a MapServer application will include step by step examples of building a map file, including defining the WEB object, the LAYER objects, and assigning symbology to these objects. Once a map file is created, the participants will then go through the process of creating a web based interface.

Important MapServer and Web mapping concepts will be discussed throughout the workshop. A significant portion of the workshop will involve accessing data from several different data types and incorporating them into a MapServer map file.

# SETTING UP A GEOSPATIAL CATALOG USING GEONETWORK

Jeroen Ticheler

## ABSTRACT

The half day workshop will focus on the implementation of a catalog to serve and access geospatial data through the Web.

A local catalog will be installed and configured. Harvesting of spatial data resources from remote servers will be configured and geospatial web map services will be set up using the embedded GeoServer and will be configured for access through the catalog web interface.

Participants will use the catalog in different ways, including the web interface and OGCCSW, OAIMHP and GeoRSS protocols. The user will learn how to use the catalog to receive automatic updates when new resources of interest become available using news feeds in different client applications (news readers, Open Layers, Google Maps and Virtual Earth). The use of user feedback mechanisms including data rating and social bookmarking will be discussed.

Attention will be given to import and export functionality of the catalog that allow integration of the publishing process in existing workflows like desktop GIS or operational data processing servers.

# COLLABORATIVE MAPMAKING WITH GEODJANGO

Josh Livni and Christopher Schmidt

## ABSTRACT

GeoDjango has been called a web framework for (Neo) Geographers with Deadlines. Students will use a preconfigured GeoDjango application to get introduced to core Django functionality. After a short example of digitizing and sharing features, we will dive into building the demo system from scratch. After the workshop, students should be able to return home with the tools and knowledge required to build practical geospatial web applications.

# FOSS4G ROUTING WITH PGRROUTING TOOLS AND OPENSTREETMAP ROAD DATA

Claude Philipona and Daniel Kastl

## ABSTRACT

pgRouting adds routing functionality to PostGIS. This introductory workshop will show you how. It gives a practical example of how to use pgRouting with OpenStreetMap road network data. It explains the steps to prepare the network data, make routing queries, assign costs to the network links and modify your results through wrapper functions.

# STANDARDIZED GEOPROCESSING WITH 52°NORTH OPEN SOURCE SOFTWARE

**Bastian Schaeffer**

## ABSTRACT

The Open Source Software Initiative 52North provides services and applications that enable standardized and distributed geoprocessing on the web. An open standard based e.g. an Open Geospatial Consortium (OGC) based SDI mostly supports the retrieval and visualization of data through web services. Data processing is usually performed by humans with more or less proprietary and monolithic Geo Information Systems (GIS). With growing network capacity and processing power, it became feasible to integrate standalone geoprocessing applications and their expert functionality into a web service environment and therefore enable web services to execute geoprocessing tasks. The OGC Web Processing Service (WPS), which became an official standard in mid 2007, is a major attempt to address this issue in a standardized way. The WPS interface specification defines a standardized way to publish and perform geospatial processes over the web and therefore fosters interoperability. Such a process can range from a simple geometric calculation (e.g. a simple intersect operation) to a complex simulation process (e.g. a global climate change model). However, the intrinsic complexity of geodata often requires the use of several processing steps to address a given problem. Thus, to automate whole business processes and form value-added chains, orchestrated geoprocessing workflows have to be built.

### Workshop Contents

After a brief introduction to the basic concepts of standardized geoprocessing, the participants will set up a scenario installation of the different 52North geoprocessing components. With the help of these free components, a common geoprocessing problem will be solved.

The workshop attendees might hand in one of their example data sets or processes to the workshop organizer in advance. The workshop organizer will choose one of the processes and datasets and apply them during the workshop.

Setting up the scenario implies:

- download the 52North WPS
- install and configure the 52North WPS
- create your own simple WPS process
- utilize existing GIS functionality in the WPS (e.g. GRASS)
- visually orchestrate distributed WPS processes (the self-made and e.g. GRASS based)
- expose the created service chain as a WPS process
- execute the created service chain as a WPS process in uDig

After successful execution of the processes in uDig, it will be explained how to export the process results to GoogleEarth.

# INTRODUCTION TO GEOPORTAL MANAGEMENT USING MAPBENDER

Arnulf Benno Christl

## ABSTRACT

This workshop gives an in-depth introduction to the software Mapbender, a managed, web based geoportal framework implementing the publish / register, find, bind, execute paradigm for geospatial data. The focus of the workshop lies on building web mapping applications with distributed Spatial Data Infrastructure components and how to manage user access.

An introduction will give an overview of the project history, development team, infrastructure, productive environments and scope of use.

# OPENLAYERS BUILDING WEB MAPPING APPLICATIONS WITH A SOLID FOUNDATION

Tim Schaub

## ABSTRACT

OpenLayers is a rapidly developing toolkit for building mapping applications in a browser. The library lets developers integrate data from a variety of sources, provides a friendly API, and results in engaging and responsive mapping applications.

This workshop will be divided into five modules offering a good introduction to newcomers while still providing advanced material to more experienced developers.

Workshop Modules:

1. Openlayers Basics – Create a "slippy map" from scratch, coding with accessible JavaScript syntax.
2. Layers – Explore the various layer types available in the library. We'll cover WMS, WFS, KML, commercial layers (Google, Yahoo, Virtual Earth) and more.
3. Controls – Your map comes to life with OpenLayers controls. Learn how to use controls available in the library and gain an understanding of how to develop your own controls.
4. Vector Data - Investigate various formats, protocols, and strategies for dealing with vector data. This module will focus on data creation, styling, and persistence.
5. Integration – OpenLayers provides the mapping foundation for your web application. Learn how OpenLayers can be used in conjunction with a UI framework like ExtJS.

The workshop will give participants access to core OpenLayers developers from The Open Planning Project, MetaCarta, Camptocamp, and DM Solutions.

# PRACTICAL INTRODUCTION TO MAPGUIDE OPEN SOURCE

Tom Fukushima and Peter Rieks

## ABSTRACT

A Practical Introduction to MapGuide Open Source is a 4 hour workshop aimed at geospatial professionals and developers interested in the MapGuide Open Source geospatial platform. The first half of the workshop will include an overview of the architecture, features, and benefits of MapGuide. Hands on sessions will demonstrate how to install and configure the software, how connect to and access data with the Feature Data Objects (FDO) technology, how to author layers and maps, and how to put those maps on the web using Flexible Web Layouts (DM Solution's Fusion technology). The second half of the workshop will provide an overview of the MapGuide Geospatial API. Hands on sessions will demonstrate how to use the API to perform geoprocessing and extend the functionality of the basic MapGuide client. At the end of the workshop attendees will know everything they need to get a Web 2.0 MapGuide application up and running.

# MAPSERVER OGC WEB SERVICES WORKSHOP

Bart van den Eijnden, Assefa Yewondwossen and 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 workshop will review the OGC specifications 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.

# MAPWINDOW GIS WORKSHOP INTRODUCTION TO CUSTOM GIS APPLICATION DEVELOPMENT FOR WINDOWS

Brian Marchionni and Ted Dunsford

## ABSTRACT

The open source MapWindow GIS project (<http://www.MapWindow.org>) is both a desktop GIS application and set of programmable mapping components. The desktop GIS application is an easy to use data visualization and editing tool while the mapping components fill a critical niche need for open source GIS development tools specifically intended for the Windows operating system and developers using the Microsoft .NET Framework.

With more than 6,000 downloads per month and several thousand registered users since becoming open source in January 2005, MapWindow GIS is rapidly becoming adapted throughout the world for uses in academia, government, and business where there is a need for simple, open source GIS development tools.

This hands-on workshop will focus on the development of custom GIS applications using the MapWinGIS ActiveX component in Visual Studio 2005. (C# and VB.NET languages) It will also explore writing plugins for the MapWindow GIS application. Members of the core MapWindow GIS Open Source Team will present the workshop and participation is welcome from any and all current and future MapWindow GIS users.

# PRACTICAL INTRODUCTION TO GRASS AND RELATED SOFTWARE FOR BEGINNERS

Marco Ciolli, Paolo Zatelli and Clara Tattoni

## ABSTRACT

GRASS is the leading FOSS GIS and its wide ranging analysis capabilities make it an ideal tool to set up environmental models, as well as to support land planning and management.

Therefore, GRASS can be an important tool in general for environmental researchers and in particular for scientists and planners in Developing Countries. However, its steep learning curve makes the first approach to GRASS sometimes tricky for beginners: this workshop aims to overcome the initial barrier between GRASS and its potential users.

The workshop has two parts: a brief GRASS overview and a hands-on session by the attendees.

The aim is to allow the first users to understand the logic of the software and to experiment some significant, although necessarily limited, data elaboration for technical and environmental GIS applications. The workshop provides a brief introduction to GRASS and then it is structured as a step by step tutorial to guide beginners in the basic applications of the software, stressing the interoperability with other FOSS and proprietary software. It will be possible for the participants to follow different paths depending on their skills and interests, while assistance at the tutorial will be guaranteed in English, French and Italian.

- First steps with GRASS
- project (location) setup
- raster and vector data import and export
- vector data analysis
- raster data analysis
- network analysis (short)
- visualization (nviz short)

Hints for practical usage of external RDBMS will be given. A custom live DVD containing all the software and the workshop documentation will be provided.

# THE OPEN-GEO STACK: OPEN-LAYERS, GEOSERVER, POSTGIS

Justin Deoliveira, Tim Schaub and Chris Holmes

## ABSTRACT

This workshop aims to get you set up with what it takes to deploy a full open geostack. Focusing on open source, open standards, and open data, you end up with solid technologies that provide flexibility in building your web mapping solution.

We begin with geodata; whether you're sitting on terabytes of information or setting up a service to collect your first point, you need a place to store your data. From persistence, we'll move on to publishing. Deploying a service that can flexibly handle reading/writing of your data, regardless of formats or origins, provides a solid core to your stack. That service will communicate with a variety of clients. We'll dive into browser based clients demonstrating tools to efficiently display your data and allow for editing, all from a web browser. Finally, we'll go beyond the browser to demo virtual globes, and we'll discuss mix and match solutions that involve proprietary and open source components in harmony. This workshop will focus on an open stack made up PostGIS as the backend datastore, GeoServer as geospatial middleware, and OpenLayers as the front end map viewer.

# HYDROLOGICAL AND GEOMORPHOLOGICAL TERRAIN ANALYSIS WITH JGRASS

Silvia Franceschi and Andrea Antonello

## ABSTRACT

In this workshop, the JGrass commands for the geomorphological analysis of catchment areas will be described. The description of each command will be accompanied by an example in which its application to the supplied test set catchment area, will be presented.

In the first part of the workshop the user will be guided through the installation of JGrass. After that some time will be spent on the most commonly used GIS commands and on the main difference between vector and raster data and their analysis.

The workshop will then proceed with the analysis of the supplied test-set, starting from the import of the digital elevation map and will walk through the creation of maps representing terrain attributes like slope and gradient. The map of flow-directions will be calculated, as well as the map of the contributing areas. These steps will lead to the extraction of the catchment basin of interest and the assessment of its morphological parameters. The commands that allow to calculate these parameters are contained in what is called the Horton Machine package that is mainly developed at the Department of Civil and Environmental Engineering of the University of Trento under the tutorship of prof. Riccardo Rigon. The commands have been divided into 7 main categories:

- DEM manipulation: commands for preliminary analyses of digital terrain models
- Basic topographic attributes: commands for the calculation of certain topographic attributes such as slope, flow directions, and contributing areas
- Network related measures: commands for the definition of some channel network properties;
- Hillslope analyses: commands for the calculation of some slope characteristics and their classification according to their morphological properties;
- Hydrogeomorphic indexes and relations: commands for the definition of some indices regarding the catchment basin;
- Basin related analyses: commands for the analyses of catchment basins;
- Statistics: commands for the statistical analyses of catchment basins;

At the end of the trail, time permitting, the user will also be guided through the models for discharge calculation and hillslope stability definition.

# INTRODUCTION TO GVSIG/SEXTANTE AS DESKTOP GIS WITH ADVANCED SPATIAL ANALYSIS AND SDI PUBLISHING TOOLS

Salvador Bayarri, Victor Olaya, José Vicente Higón and Laura Díaz

## ABSTRACT

The workshop will introduce users to gvSIG, including practical exercises to display local and remote data, edit and create printable maps. In addition attendants will use gvSIG to publish maps, data and metadata directly into a number of FOSS OGC-compliant server tools such as MapServer, GeoServer and GeoNetwork.

SEXTANTE is a set of more than 200 tools for gvSIG, which add advanced analysis capabilities to it. In this workshop, we will review the main elements of SEXTANTE, such as the SEXTANTE toolbox, the graphical model builder or the command-line interface, all of which are used to access those analysis tools.

At the end of this workshop, attendants will have a fair knowledge of the main concepts of SEXTANTE, and will be able to use some of the most common extensions to perform basic analysis tasks. More important, they will have a good foundation to start exploring other extensions not directly covered in this workshop.

# WEB BASED GIS AND DOMAIN MODEL INTEGRATION

Pieter de Graef

## ABSTRACT

Often, domain model integration forms an important cornerstone for the base architecture of a software project. The goal of this workshop is to construct a user-friendly, web based GIS application but with the look and feel of a fat client based on open source products. We will show developers how to integrate the complexity of a rich domain model into a fully web based GIS application using MAJAS .

MAJAS is a clientserver solution for fetching, interpreting and presenting geographical data. The client is an extension of the Dojo widget system, implementing various widgets like a map, a toolbar, a layertree and many more. Widget intercommunication is provided by the powerful Dojo topic system. The server on the other hand is based on various technologies such as Geotools and Hibernate Spatial for data handling and persistence.

In this workshop we will concentrate on how to use Hibernate Spatial to add complex behaviour to otherwise standalone geographical objects, and how to extend this behaviour to the client. To this end, we will use a PostgreSQL/PostGIS database, and an example domain. As a first step we will configure layers and their features in maps and visualize them in a browser. This configuration of layers will include styling and attribute mapping. Through hibernate spatial MAJAS is able to support complex relationships like one-to-one, one-to-many, many-to-many as well as inheritance and allow to build and manage rich feature models.

Secondly we will have a look at the client side. More specific at the broad range of widgets available to include in your web page and how to adjust or override them. These widgets will then help us in providing base functionality such as navigating, searching, filtering, and editing.

Finally we will come to the more exotic possibilities such as geometric simplification, or Open Street Map compatibility. We will also use the Hibernate configured objects in combination with the widgets to create an example use-case.