February 1-6, 2009
Cancun, Mexico

Tutorial Proposal Form for GEOWS 2009

A   Tutorial Title

Geospatial Decision Making in the Semantic Web

B   Instructors

The proposed tutorial is presented by two instructors – one from the geospatial community and one from the Semantic Web field. Having both domains represented here makes it possible to address potential applications for the proposed solution for both communities. The full list of tutorial presenters with contact details is available in Section I of this proposal.

Contact details for the tutorial:

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C   Abstract

The proposed tutorial is based on results and solutions developed within the European funded SWING project [1]. Geospatial decision making with the help of geographic information served via spatial data infrastructures (SDIs) can benefit significantly from Semantic Web technologies. In the context of mining (especially, finding suitable locations for new excavation sites), a sophisticated solution based on various semantic-enabled software components has been developed. They realize, for example, the following innovative functionalities: complex reasoning for the discovery of geospatial resources, annotation of geospatial web services using intuitive user interfaces, specification of work-flows to create new information from existing web services, and more. The outcome is not only based on the work within the SWING project, though. Most of the presented applications and solutions have been developed over many years in several projects like ACE-GIS [2], SODIUM [3], DIP [4], or SUPER[5].

The tutorial is discussing the benefits of the various solutions developed in the projects, and introduces methods how to deploy them into other scenarios.

D   Scope

The tutorial is planned as half-day event (~4 hours), divided into (1) an introductory presentation into the developed tool-set and potential applications, and (2) a hands-on session. In the second part attendees are able to try out the various components by developing simple solutions for different scenarios.

E   Intended Audience

As target audience we expect both, practitioners and researches, interested in geospatial decision making, to attend the suggested tutorial. Additionally, experts in the domain of Semantic Web, and/or Expert Systems will be interested in the results we are going to present. Since standardization plays a significant role within our work, and the relation to existing standards will be mentioned throughout the whole tutorial, experts coming from OGC and/or ISO are welcomed as well.

Although no specific knowledge is required to follow the tutorial, basic knowledge about Geographic Information Systems, Geographic Information Retrieval, and some ideas about the Semantic Web, helps.

Material is going to be a booklet, with the following information: an overview of the developed components, an walk-through using the existing SWING mining scenario, and guidelines (with links to resources) to develop own solutions based on the SWING components. The booklet will be available as download from the tutorial homepage.

F   Motivation

A tutorial at next year's GEOWS in Cancun, Mexico gives us, the organizations taking part in European funded projects, the possibility to present the ideas and developed results to a global audience. Feedback from other communities is very welcomed, as well as interesting insights into similar applications developed within other (non-European) projects.

A second motivation is our interest to see the developed stack of applications being deployed in different scenarios. We believe the audience will be able to see the potential benefits, and will be interested to apply our results to their own scenarios. The different backgrounds of users attending GEOWS will ensure a diverse audience, and therefore a broad spectrum of possible use cases.

G   Objective

The objective of the proposed tutorial is focussed mainly on two issues: to communicate the potential benefits of semantic-enriched applications for geospatial decision making, and to demonstrate how the solutions developed within the European SWING project can be applied to different scenarios. For the first point we will highlight the benefits of information retrieval (i.e. discovery of services providing the required information) and information creation (composition of different web services to produce decision support documents) if Semantic Web technology is deployed. Discovery is, for example, more intuitive, allows for more precise search queries, and better recall rates. Creating new web service on the fly using UML-based compositions has been simplified as well.

Having introduced the discussion with the benefits, we identify the requirements of such an environment. We conclude the demonstration with three selected scenarios which represent the sophisticated capabilities of the components developed within the SWING project.

The presented components are mainly focussed on a specific use case, namely the discovery and the management of excavation sites. Our second objective is to demonstrate the applicability for other settings. The only requirement for the use case is the availability of the information in the form of (well spread) OGC-conformal web services. With the help of a practical tutorial we are going to walk-through a typical application, and demonstrate how the stack of applications developed for SWING can also be used in completely different scenarios (as long as the underlying decision making process is based on geographic information).

H   Outline

The following section provides an outline of the tutorial.

Part 1: Theory Session (Lecture Style, ~2h)

   (1) Basics

   1.   Introduction into Geospatial Decision Making

   2.   Introduction into Geographic Information Retrieval

   3.   Introduction into the Geospatial Semantic Web

   4.   Swing Architecture & developed components

   5.   Annotation of resources & reasoning with annotations

   (2) Scenarios

   1.   Scenario (annotation, registration)

   2.   Scenario (semantic discovery)

   3.   Scenario (composition of new service, annotation, registration)

Part 2: Hand-On session (~2h)

   (3) The attendees get the task to build a composition, annotate them using the provided domain ontologies, register them in a catalog, discover and visualize them in the end-user interface, and publish them, in the end, as interactive map.

I   Biographical Sketch

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Patrick Maué is currently pursuing a PhD at the Institute for Geoinformatics (http://ifgi.uni-muenster.de) in Münster, Germany. His research is focussed on possible synergies effects between the Semantic Web and systems for geographic information retrieval (GIR). He works in the European funded SWING project and the German funded project GDI-Grid (http://www.gdi-grid.de). He holds a diploma in Geoinformatics which he has acquired at the Institute for Geoinformatics.

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Sven Schade is pursuing a PhD at the Institute for Geoinformatics in Münster, Germany. He is an expert in SDI, schema translation, and ontology engineering and currently leads the ontology work package of the SWING project. He holds a diploma in Geoinformatics which he has acquired at the Institute for Geoinformatics in 2004. Sven has been involved in several German and EU funded projects, e.g. SWING, ACE-GIS, and meanInGS.

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Dumitru Roman works as a researcher at STI Innsbruck (http://www.sti2.at) in the area of semantically-enabled service-oriented architectures. Since joining DERI he has been involved in several FP5 and FP6 EU funded projects, e.g. SWWS, DIP, SWING, SUPER, etc., in the area of semantic Web and Web services. Before joining DERI Innsbruck, he received a Diploma Engineer in Computer Science from the University of Cluj-Napoca, Romania.

J   Major References

[1]   SWING (Semantic Web services INteroperability for Geospatial decision making)
          Url: http://swing-project.org/

[2]   ACE-GIS (Adaptable and Composable E-commerce and Geographic Information Services)
          Url: http://www.ist-world.org/ProjectDetails.aspx?ProjectId=b0731d0ad18642f0a55c3cbc978ecd0b

[3]   SODIUM (Service Oriented Development In a Unified fraMework)
        Url: http://www.ist-world.org/ProjectDetails.aspx?ProjectId=0f24ee09a2df46738093d0ed9f59b524

[4]   DIP (Data, Information , and Process Integration with Semantic Web Services)
        Url: http://dip.semanticweb.org/

[5]   SUPER (Semantics Utilised for Process Management within and between Enterprises)
        Url: http://www.ip-super.org/

K   Supplementary Materials

- The demonstrations available at http://www.swing-project.org/demos.html show some of the core functionalities of the developed components.

- Ontologies, the end-user interface MIMS, and published maps are available from the website managed by the project partner BRGM, available at http://swing.brgm.fr/.

- All deliverables of the SWING project are publicly available, and can be downloaded from: http://swing-project.org/deliverables