

Preface for GeoLD 2022: 5th Geospatial Linked Data Workshop

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Abstract

GeoLD 2022 was a full-day workshop that took place on May 30th, 2022, in Hersonissos, Greece, co-located with the 19th edition of the Extended Semantic Web Conference (ESWC2022). This workshop invited papers covering the challenges and solutions for handling with GLD, especially for building high quality, adaptable, geospatial infrastructures and next-generation spatial applications. The workshop demonstrated the latest approaches and implementations and to discuss the solutions to challenges and issues arising from research and industrial organizations.

Keywords

Geospatial data, Linked data, GIS

1. Introduction

Geospatial data are essential for many traditional GIS tasks such as navigation, logistics, and tourism, but even more for emerging technologies like autonomous vehicle navigation, innovative city technologies, and further location-based services. Geospatial Linked Data (GLD) is a crucial source of machine-readable pre-interpreted information for all these technologies. Recently, we can observe a transformation process of spatial data infrastructures from previously merely acting as data providers to becoming brokers of geospatial information of different kinds, origins, quality, and a need to interconnect and incorporate information from different data repositories, often even in real-time. GLD enables web-based, interoperable geospatial data infrastructures that may enhance and support existing standardization efforts like Europe's INSPIRE directive. This need for GLD integration leads to efforts to create next-generation knowledge graphs which integrate multiple spatial datasets with large numbers of general

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datasets containing some geospatial references (e.g., *DBpedia*, *Wikidata*) and even volunteered geographic information (e.g., *LinkedGeoData*) and sensor data. This integration, either on the public Web or within organizations, has immense socio-economic and academic benefits. The upsurge in linked data-related presentations in the Eurogeographics data quality workshop series, in relevant journal publications, in activities of standardization bodies (OGC GeoSPARQL), and in Spatial Data Applications shows a deep interest in GLD in national mapping agencies and beyond. Moreover, geospatial information systems benefit from Linked Data principles in building the next generation of spatial data applications, e.g., federated smart buildings, self-piloted vehicles, delivery drones, or automated local authority services, which is of increasing interest to various stakeholders.

The GeoLD 2022 workshop invited papers covering the challenges and solutions for handling GLD, especially for building high-quality, adaptable geospatial data infrastructures and next-generation spatial applications. We aim to demonstrate the latest approaches and implementations and discuss the solutions to challenges and issues arising from research and industrial organizations.

2. Geospatial Linked Data Workshop

The GeoLD 2022 workshop was a full-day workshop that took place on May 30th, 2022, in Hersonissos, Greece, co-located with the 19th edition of the Extended Semantic Web Conference (ESWC2022).

The workshop started with article presentations and continued for three sessions. The presented articles were as follows:

- Vasilis Kopsachilis, Nikos Vachtsavanis, and Michail Vaitis: *Semi-automatic semantification of institutional, spatial datasets*
- Vasilis Kopsachilis and Michail Vaitis: *GeoLOD Demo: A catalog and recommender for spatial linked data*
- Antonis Troumpoukis, Stasinou Konstantopoulos and Nefeli Prokopaki Kostopoulou: *A Geospatial Join Optimization for Federated GeoSPARQL querying*
- Efthymia Moraitou, Sotirios Angelis, Konstantinos Kotis, George Caridakis, Ermioni Eirini Papadopoulou and Nikolaos Soulakellis: *Towards Engineering Drones' Semantic Trajectories as Knowledge Graphs*
- Maria Despoina Siampou, Nikolaos Karalis and Manolis Koubarakis: *Extending YAGO4 Knowledge Graph with Geospatial Knowledge*
- Damien Graux: *Navigating the Earth with pure SPARQL*
- David Habgood, Timo Homburg, Nicholas John Car and Milos Jovanovik: *Implementation and Compliance Benchmarking of a DGGS-enabled, GeoSPARQL-aware, Triplestore*

In addition, the workshop featured an invited talk by Haonan Qiu "Ontology-Based Modelling and Processing of Maps for Autonomous Vehicles" which gave practical insight in how geospatial linked data is used at BMW to support autonomous navigation. The talk focused on the use of maps for consistency checks for autonomous vehicle navigation, the setup of such systems and the challenges of the provision of these systems in practice.

The workshop continued with a keynote presentation by Erwin Folmer about "Lessons Learned from Building the Largest Spatial Knowledge Graph in the Netherlands". As an expert on linked data standards and interoperability in the Netherlands, Erwin Folmer provided the participants with first-hand experiences of the challenges entailed by making geospatial linked data approaches a reality in the industry. He challenged the participants by confronting them with a presentation of the lessons learned from hosting geospatial linked data and stimulated a discussion about the future developments in geospatial semantic web data research, standardization, and practical application of these technologies.

The workshop ended with the workshop chairs wrapping up the sessions and closing the workshop officially. The workshop received 12 paper submissions, 7 of which were accepted for presentation. The workshop attracted papers from industry and academia.

3. Organizing Committee

- Timo Homburg, Mainz University Of Applied Sciences, Germany
- Beyza Yaman, ADAPT Centre, Trinity College Dublin, Ireland
- Mohamed Ahmed Sherif, University Of Paderborn, Germany
- Armin Haller, Australian National University, Australia

4. Program Committee

- Konstantina Baretta, Marine Traffic, Greece
- Manolis Koubarakis, National and Kapodistrian University of Athens, Greece
- Sergio José Rodríguez Méndez, Australian National University, Australia
- Milos Jovanovik, Ss. Cyril and Methodius University in Skopje, N. Macedonia
- Mirko Spasić, OpenLink Software, UK
- Nikolaos Karalis, DICE research group, University of Paderborn, Germany
- Nicholas Car, Surround Australia, Australia
- Giorgos Giannopoulos, IMIS, the Institute for the Management of Information Systems, Athens, Greece
- Erwin Folmer, Kadaster, University of Twente, The Netherlands
- Pasquale Di Donato, swisstopo/COGIS, Switzerland
- Gobe Hobona - Open Geospatial Consortium, Wayland, MA, USA
- Rob Brennan, ADAPT Centre, Dublin City University, Ireland
- Adrian Wilke, DICE research group, University of Paderborn, Germany
- Stefan Heindorf, DICE research group, University of Paderborn, Germany
- Abdullah Fathi Ahmed, DICE research group, University of Paderborn, Germany
- Cassia Trojahn, University of Toulouse, France
- Haonan Qiu, BMW Car IT, Ulm, Germany
- Benedicte Bucher, University Gustave Eiffel, IGN, EuroSDR

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