Preface for GeoLD 2021: 4th Geospatial Linked Data Workshop*

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Abstract. The GeoLD 2021 was a full-day workshop that took place on June 7th, 2021 which was hosted virtually. It was co-located with the 18th Extended Semantic Web Conference (ESWC2021). 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 is vital for both traditional applications like navigation, logistics, and tourism and emerging areas like autonomous vehicles, smart buildings and GIS on demand. Spatial linked data has recently transitioned from experimental prototypes to national infrastructure. However the next generation of spatial knowledge graphs will integrate multiple spatial datasets with the large number of general datasets that contain some geospatial references (e.g., *DBpedia, Wikidata*). This integration, either on the public Web or within organizations has immense socio-economic as well as academic benefits. The upsurge in Linked data related presentations in the recent Eurogeographics data quality workshop[4] shows the deep interest in Geospatial Linked Data (GLD) in national mapping agencies. GLD enables a web-based, interoperable geospatial infrastructure. This is especially relevant for delivering the INSPIRE directive in Europe. 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.

[4] https://eurogeographics.org/calendar-event/3rd-international-workshop-on-spatial-data-quality/

2 Geospatial Linked Data Workshop

The GeoLD 2021 was a full-day workshop that took place on June 7th, 2021 which was hosted virtually. It was co-located with the 18th Extended Semantic Web Conference (ESWC2021).

The workshop started with article presentations and it continued for 3 sessions. The presented articles were as follows:

- Ba-Huy Tran, Catherine Comparot, Cassia Trojahn and Nathalie Aussenac-Gilles, Semantic Integration of Raster Data for Earth Observation on Territorial Units
- Alexandra Rowland, Jorrit Overeem and Erwin Folmer, Demo: GeoDataWizard for Linked Spatial Data Creation
- Alexandra Rowland, Erwin Folmer, Wouter Beek and Rob Wenneker, Interoperability and Integration: An Updated Approach to Linked Data Publication at the Dutch Land Registry
- Nicholas John Car and Timo Homburg, GeoSPARQL 1.1: An Almost Decadal Update to the Most Important Geospatial LOD standard
- Frans Knibbe, Models for space unite! The Need and Opportunities for Domain–transcendent Modelling of Spatial Data on the Web.
- Nicholas John Car, L4DR: A 2nd-gen, National GeoLD System
- Alex Randles and Declan O'Sullivan, Assessing Quality of R2RML Mappings for OSi's Linked Open Data portal
- Christophe Debruyne and Kris McGlinn, Reusable SHACL Constraint Components for Validating Geospatial Linked Data
- Jordane Dorne, Nathalie Aussenac-Gilles, Catherine Comparot, Romain Hugues and Cassia Trojahn, From EO Change Rasters to Knowledge Graphs: An approach Based on Regions of Interest
- Jonathan Yu, Simon Cox, Benjamin Leighton, Ashley Sommer, David Lemon, Shane Seaton and Paul Box, Navigating Spatial Relationships between Datasets Using Reified Links
- Beyza Yaman, Kevin Thompson and Rob Brennan, A SKOS Taxonomy of the UN Global Geospatial Information Management Data Themes
- Elio Hbeich, Ana Roxin and Nicolas Bus, Connecting Granular and Topological Relations through Description Logics
- Gobe Hobona, Rob Atkinson, Greg Buehler, Scott Simmons and Ingo Simonis, Establishing a Linked Data Infrastructure for the OGC Body of Knowledge
- Henrique Santos, James P. McCusker and Deborah L. McGuinness, Geospatial Reasoning with Shapefiles for Supporting Policy Decisions

The workshop followed with the panel session. Rob Brennan moderated the panel session and Cassia Trojahn, Nicholas Car and Armin Haller were the invited panel mediators. They discussed the need and opportunities for modelling of spatial data on the web with open challenges for the next generation Geospatial Linked Data infrastructure.

The workshop ended with the keynote talk of Krzysztof Janowicz who is a (full) professor for Geographic Information Science and Geoinformatics at the Geography Department of the University of California, Santa Barbara, USA. He delivered an inspiring talk on "KnowWhereGraph: Thoughts on Designing and Utilizing a Knowledge Graph at the Human-Environment Interface". In this keynote, Krzysztof Janowicz introduced their ongoing work on 'KnowWhereGraph', a large-scale, pre-integrated, cross-domain knowledge graph with data at the human-environment interface, together with services to access this graph from within Geographic Information Systems. He discussed key design decisions, application areas in disaster relief and food supply and point out some of the key challenges for the next years to come.

Finally the workshop chairs wrapped up the sessions and closed the workshop.

In total, the workshop received fifteen papers, 14 of which were accepted for presentation (2 long papers, 11 short papers and 1 demo). The workshop attracted papers both from industry and academia.

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