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GEOLOGICAL MODELING AND GEOSPATIAL DATA ANALYSIS (GMGDA)

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DESCRIPTION

Unstructured data is explored in the context of geological analysis. Various sources of unstructured data are described, including scientific publications and government reports, and discussion of the geospatial information embedded within these sources is provided. Geoscientists and GIS professionals who follow data analytics trends have surely come across the "big-data" buzz in the media over the past few years. Huge benefits in fields as diverse as astronomy, healthcare, and natural resource exploration are envisioned but big data is only as useful as the insights it provides. Challenges at the leading edge of modern analytics often arise not only from data volume but also from data format. Specifically, the structure—or lack thereof—of relevant and available data can impede or prevent the extraction of useful information. The use of digital information in geological fields is becoming very important. Thus, informatization in geological surveys should not stagnate as a result of the level of data accumulation. The integration and sharing of distributed, multi-source, heterogeneous geological information is an open problem in geological domains. Applications and services use geological spatial data with many features, including being cross-region and cross-domain and requiring real-time updating. As a result of these features, desktop and web-based geographic information systems (GISs) experience difficulties in meeting the demand for geological spatial information. To facilitate the real-time sharing of data and services in distributed environments, a GIS platform that is open, integrative, reconfigurable, reusable and elastic would represent an indispensable tool. The geological cloud-computing platform defines geological ontology semantics; designs a standard geological information framework and a standard resource integration model; builds a peer-to-peer node management mechanism; achieves the description, organization, discovery, computing and integration of the distributed resources; and provides the distributed spatial meta service, the spatial information catalog service, the multi-mode geological data service and the spatial data interoperation service.

Satellite positioning systems, real-time traffic maps, ride-hailing services, and e-commerce… all of these applications are enabled by location-based – or "geospatial" – technology and information. Geospatial information is critical for countries' ability to respond to the COVID-19 pandemic. Effective epidemiological monitoring builds on common geospatial data to track the virus spread, identify vulnerabilities, manage facilities and target responses. Geospatial information is not only essential for the commercial sector, safety and security, but also the foundation for many e-government applications, such as property registration, utility management, and building smart cities.

AIMS & SCOPE

Without geospatial data analysis, today's challenges in big data applications such as earth observation, geographic information system/building information modeling (GIS/BIM) integration, and 3D/4D landscape planning cannot be solved. Furthermore, geospatial data management plays a connecting role between data acquisition, data modelling, data visualization, and data analysis. It enables the continuous availability of geospatial modelling and the replicability of geospatial data analysis. GMGDA offer a platform conducive to the analysis of spatial trends within geological datasets, which can yield important insights into erosional and depositional histories in glacially modified terrains. The distribution of features and their attributes in geographic space are governed by three relationships: (1) distance, (2) connectivity, and (3) direction. The analytical procedures used to assess these relationships are well-supported in most GIS software and include spatial statistical and geostatistical analyses, exploratory spatial data analyses, and spatial modelling.

Special issue on geological modeling and geospatial data analysis publishes high impact, original research at the interface between Geology, geological modeling and geospatial data analysis. Publications should apply modern geological paradigms, whether computational or informatics-based, to address problems in the geosciences. Geoscientific topics of interest include: mineralogy; petrology; geochemistry; geomorphology; paleontology; stratigraphy; structural geology; sedimentology; hydrogeology; oceanography; atmospheric sciences; climatology; meteorology;

geophysics; geomatics; remote sensing; geodesy; hydrology; and glaciology or any other related fields.

PUBLICATION IMPACT

Geographic data are produced or collected by scientists in different ways to study problems. Although online geographic data are accessible across the globe, there is a lack of a unique platform that enables scientists to share geographic data produced locally. Such a lack of scientific data communication has limited scholars to share datasets in a professional and credible way. A large portion of innovative and novel ideas could not come to action due to unavailability of data or the scientific findings could have never been retested and verified, as the data have been always kept as a "black box". Geological modeling and geospatial data analysis is expected to become a key research field for the next decade to solve the integration of unstructured and structured data as well as the extraction of geospatial knowledge, i.e., data and patterns, in interdisciplinary applications. Furthermore, geospatial data science will bridge the gap between modern information technology concepts and the geo-related sciences.

In this context, this special issue contributes to publish international state-of-the-art research on emerging topics in the field of geological modeling and geospatial data analysis. This special issue is meant to be an interdisciplinary forum for leading researchers, practitioners, scientists and geologists in related areas to present the latest developments and applications, to discuss cutting-edge technology, to exchange research ideas and to promote international collaboration on all aspects of geological modeling and geospatial data analysis.

Published papers in this themed issue shall include high-impact topics that can attract a lot of attention from researchers around the world. Contributions are expected from highly-cited researchers on geospatial modelling and data analysis. This special issue could be further highlight by a range of options including press release at China University of Geosciences (CUG) website, publishing a blog post, or sharing on social media. All these efforts can ultimately increase this special issue as well as journal citations itself.

IMPORTANT DATES

- Full paper submission deadline: **31/12/2021**
- Initial decisions on revisions or rejection: **31/03/2022**
- Final manuscripts submissions: **01/06/2022**
- Expected publication date: **31/08/2022**

HOW TO SUBMIT

When entering your submission please choose the option type of an article: "**Geospatial data modelling**" Submissions for the special issue are now open. In case of any technical problems, please contact the Managing Editor of Open Physics: **Juliusz Skoryna**, Ph.D., Juliusz.Skoryna@degruyter.com