

# ISPRS TECHNICAL COMMISSION IV MIDTERM SYMPOSIUM 2018

## PREFACE

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### Commission IV

The world's population is predicted to reach 7.5 billion in 2018, and by 2050 it is predicted to be 9.7 billion. Managing the social and economic changes brought on by this increasing population will require new ideas and spatial information decision making tools. The pressures placed on the usage of spaces that people live and work in will necessitate decisions that are based on 3D and higher spatial dimensions. The Commission is dedicated to advance the research in spatial information sciences in modelling, structuring, management, analysis, visualization and simulation of data with focus on the third spatial dimension and taking into consideration dynamic changes. A special attention is given to linking information about real-world physical phenomena with societal, organizational and legal information. The intentions are to contribute to advancements to visualization (web-based, VR and AR) simulation and city analytics. The work largely carried out in cooperation with international organizations such as FIG, UDMS, 3DGeoInfo, ICA, OGC, ISO and Web3D.

The Commission consists of 10 scientific areas of research, which are coordinated by 10 working groups (WG) as follows - WG1: Strengthen the work on multidimensional spatial model and representations towards seam-less data fusion; WG2: Advance the semantic modelling, development and linking of ontologies; WG3: Intensify research into data interpretation, quality and uncertainty modelling; WG4: Strengthen the research on crowdsourced data and public participation, towards community-driven and participatory applications, collaborative mapping and use/usability of maps; WG5: Stringent the research on seamless indoor/outdoor location-based services, navigation and tracking, and analysis of human movement; WG6: Advance interoperable Internet of Things, Sensor web, SDI and linked data; WG7: Advance the research on spatial data types, indexing methods and analysis to further contribute to development of spatial DBMS for management and analysis of multi-dimensional data; WG8: Encourage the use of functional programming and streaming algorithms in development of demos and applications as well as parallel and distributed processing paradigms; WG9: Advance visual analytics, online multi-dimensional visualization on mobile and desktop devices, considering human-centered applications, privacy and security issues; WG10: Advance knowledge on use of spatial information (BIM/GIS) for urban modelling; ICWG IV/III: Global Mapping: Updating, Verification and Interoperability with the mission to promote the development of advanced methodologies and applications related to the update, verification and interoperability of geospatial databases. All these themes were presented in this year ISPRS TC IV Midterm Symposium 2018

The symposium was held in Delft, Netherlands, October 1-5, together with *FIG* – the 6th International Workshop on 3D Cadastres, *UDMS* – the 3rd International Conference on Smart Data and Smart Cities and *the13th 3D GeoInfo Conference*, all under the umbrella of *GeoDelft 2018* conferences. These events have provided a synergy of the research communities from four related international organizations. Particularly, the aim of the ISPRS TC IV midterm symposiums was to bring together academics and professionals from industry working in the field of Spatial Information Sciences (SIS) to exchange the cutting-edge research and technological developments in this field. Moreover, the focuses outlined by the commission plan is to increase ISPRS TC IV exposure to diverse SIS research communities and to exchange the knowledge gained within its ten working groups and five intergroups. Five speakers Dorine Burmanje, Rudzhi Chen, Rod Thompson, Claus Nagel and Antonio Jara provided inspiring talks to enrich and share their experiences with the attendees. For all these reasons, the symposium was named *3D Spatial Information Science - The Engine of Change*.

The symposium provided presenters and attendees with an engaging forum to communicate research findings, disseminate advancements in new and emerging theories, and demonstrate the applications and technologies of the spatial information sciences. The research presented at the event was captured through papers and abstracts published in the traditional proceedings of the 2018 ISPRS TC IV Midterm Symposium that includes the collection of *ISPRS Annals* and *ISPRS Archive*. The papers and abstracts were selected for inclusion through a rigorous peer-review process. The *ISPRS Annals* contain 36 papers and the *ISPRS Archives* consist of 108 papers. The diversity of the research topics presented in the published papers clearly indicate the wide range of topics within the field of Spatial Information Science. A rigorous peer-review process by the ISPRS TC IV conference Scientific Committee members ensured quality, diversity and innovation. The program consisted of 130 oral presentations and 14 posters. One of the sessions was jointly organised by OGC, SDSC and ISPRS and discussed recent interoperability developments. Three workshops were organized as follows: Theme session on Virtual & Augmented Reality: Technology, Design & Human Factors, Capacity Building for High-Resolution Land Cover Inter-comparison and Validation and OpenStreetMap mapathon. John Shi and Gerard Heuvelink, invited speakers at WG 3, discussed issue related to uncertainty in spatial modelling.

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Information Netherlands. We are thankful to the members of the GeoDelft 2018 Organizing Committee, ISPRS TC IV Scientific and Organizing Committees, sponsors, exhibitors, students, volunteers and all those who have through their dedicated work contributed to a successful organization of the symposium.

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