

THE 17th 3D GEOINFO CONFERENCE: PREFACE ARCHIVES

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Commission IV, WG IV/9

KEY WORDS: Preface, 3DGeoInfo 2022

3D spatial modelling has become critical for many applications and disciplines. 3D models are seen as a critical component of spatial Digital Twins for urban and city planning, infrastructure monitoring and maintenance, or buildings’ efficiency, comfort and safety. Robust 3D modelling frameworks and tools are essential for local and national governments and international peak bodies to support their road maps towards sustainable built environments. 3D models are critical for many cross-discipline and multi-sectoral challenges to drive research and developments for climate adaptability, city and region liveability, and strengthening coping capacity to natural hazards.

3D modelling has been greatly advanced in the last 25 years. Progress can be observed in each component of the geoinformation chain: processing, data structuring and management, analytics, visualisation and simulation. In the last several years, much attention has been given to approaches and methodologies for 3D data integration at semantic and geometric levels, developing theory and tools for true 3D analytical operations, and high-performance 3D visualisation platforms allowing for immersive exploration and interaction. The principles for Findable, Accessible, Interoperable and Reusable (FAIR) data, relaced in 2016, became a leading concept in building system architectures and application-oriented interfaces. The technology developments have reached a level which allows for the processing of large data sets, which is yet another stimulus for investigating 3D solutions.

Despite the tremendous advances in 3D modelling of geoinformation, the challenges are unsettling. Many aspects related to the efficient collection and integration of 3D geo-information, applied semantics and ontology, methods and algorithms for 3D analysis, artificial intelligence and processing of big data are still open, while agencies, organisations and governmental authorities need to improve their repositories to improve the use and reuse of 3D data. Many of the available 3D data sets are still closed or can be obtained under special agreements and against specific often high costs.

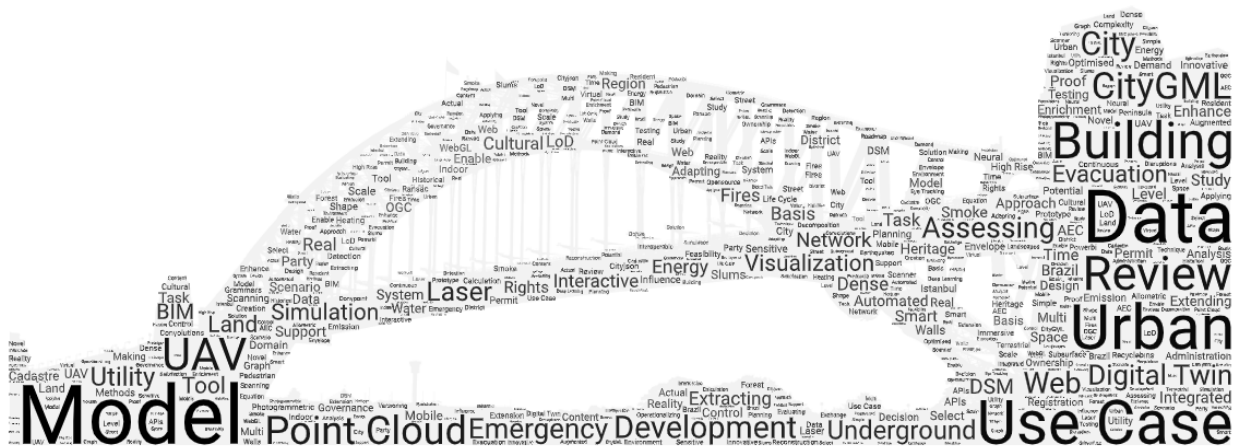


Figure 1: Visualisation of keywords in the shape of Sydney Harbour Bridge, Sydney, NSW, Australia

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The 3DGeoInfo conference aims at bringing together international researchers, experts, software developers and professionals to exchange to discuss state-of-the-art research, exchange experiences and ideas and facilitate the dialogue on emerging topics in the field of 3D geo-information. The conference aims to offer an interdisciplinary and cross-domain forum in the fields of 3D data collection, modelling, management, maintenance, analysis, simulation and visualization of 3D geoinformation. The conference has been the flagship conference for advances in 3D geo-information for 17 years. It has been hosted by research groups on four continents. It was first organised in Kuala Lumpur Malaysia, in 2006 by Alias Abdul Rahman, Volker Coors and Sisi Zlatanova, with the idea to facilitate the research and development in the field of 3D geoinformation. Since then, the conference was organised in Delft, The Netherlands (2007), Seoul, Korea (2008), Ghent, Belgium (2009), Berlin, Germany (2010) Wuhan, China (2011), Quebec, Canada (2012), Istanbul, Turkey (2013) Dubai (2014), UAE, Kuala Lumpur, Malaysia (2015), Athens, Greece (2016), Melbourne, Australia (2017), Delft, The Netherlands (2018), Singapore (2019), London, UK (2020), New York, USA (2021).

Through the years the conference organisers hosted 3D GeoInfo together with other national and international events. For example, the conferences in 2014, 2016, 2018 and 2021 were joint with the international workshop on 3D Cadastres. The 3D GeoInfo conferences have always attracted high-quality scientific papers. Selected papers of the first nine conferences were published in a series of Springer books. Since 2015, it became a tradition to organise the conference under the auspices of ISPRS and publish the accepted papers in the ISPRS proceedings (Archives and Annals).

The 17th edition of this conference was jointly organised with the Smart Cities Smart Data conference at the University of New South Wales, Sydney. Similar to previous editions this joint event attracted cutting-edge research, experience, and implementation relevant to city and infrastructure data, analytics, collaborative environments, and platforms for smarter decision-making at local, national, and international levels. This was the first conference after opening the Australia borders and lifting Covid1-9 restrictions for participation in conferences and meetings. The organisers had the ambition to provide possibilities to a large audience of researchers to meet and elaborate on their achievements. Therefore the call for papers addressed broad but exiting areas: Sensing technologies, laser scanning and smart cities, Drones for monitoring/inspecting cities and construction sites, 3D/4D modelling of cities, Monitoring systems, Big data/big spatial data analysis and management BIM and infrastructure, BIM/GIS integration and digital twins, Digital twins levels of maturity, ICT and smart cities, Realtime/web-based/interactive data visualisation, Cities' dashboards, Data science, visualisation and City Analytics, Smart Energy efficiency solutions, Mobility data and visualisation, Data and analytics for circular economy in cities, Participation and empowerment, Privacy, data security challenges in digital twins and smart cities, Open data and open urban platforms, Crowdsourcing data collection and analytics, Smart cities during and after Covid-19, Application of Artificial Intelligence (AI) and machine learning, Smart transportation, Net zero emission cities, Blockchain technology for municipal management.

This volume consists of 25 peer-reviewed scientific papers. These were selected on the basis of a double-blind review of extended abstracts among the papers submitted to the joint event. Each paper was reviewed by two scientific reviewers. The authors of the extended abstracts were encouraged to prepare a full paper considering the comments of the reviewers. The selected paper focussed on topics related to BIM (1), CityGML (4), LADM (1), digital twins (4), pointclouds processing (4), 3D modelling (3), 3D data integration (3), 3D simulation (1), indoor navigation (1), VR/AR (2), web-based applications (1). Figure 1 and Figure 2 illustrate the word count of keywords and titles in the accepted papers.

The joint event program consisted of scientific presentations, keynote speeches, panel discussions and workshops. The conference was opened by minister Rob Stokes and minister Victor Dominello. The four scientific keynote speakers were Prof Volker Coors (HFT Stuttgart, Germany), USC, US), Prof. Flora Salim (UNSW, Sydney, Australia), Prof. Nick Bailey (University of Glasgow, UK) Prof. Debra Laefer (NY University, USA) and Prof Michael Batty (UCL, UK) discussed different aspects of Smart Cities, 3D modelling and Digital Twins for different applications. The scientific sessions were blended with industry presentations to provide more opportunities to exchange ideas and experiences, connect people and researchers from all over the world. Several pre-conference workshops gave the possibility to learn about CityGML 3.0, Urban Simulations, Web-based visualisation and streaming, 3D modelling and navigation, EU GATE project on Digital Twin, Liveable City Digital Twin project, Australia data housing platform. Invited speakers elaborated on tendencies advances in Digital Twins for infrastructure. The day was open with keynotes by New South Wales, Victoria and Queensland on the state-of-the-art of state Digital Twins. The workshops were closed with a panel session at which professionals, governments and academia discussed challenges to using geoinformation in Digital Twins and Smart Cities.

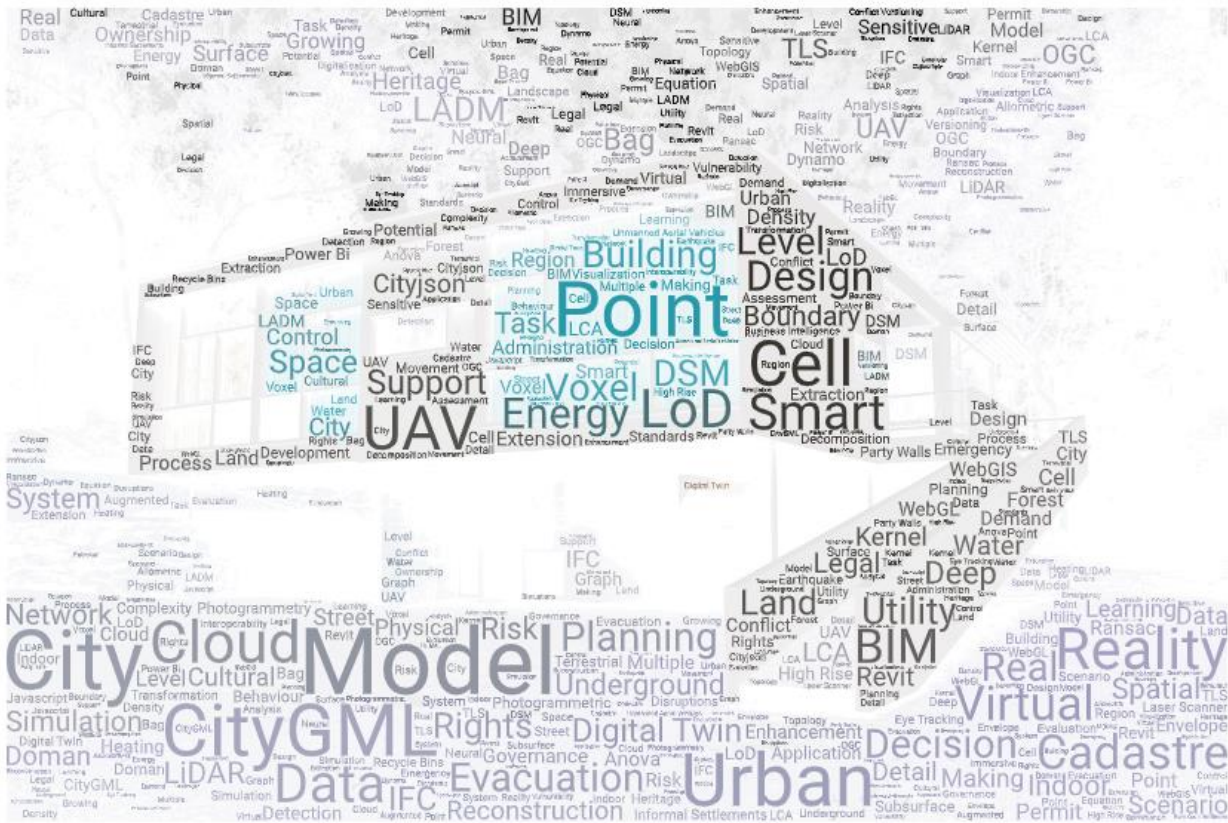


Figure 2: Visualisation of titles in the shape of Rose Seidler House, Wahroonga, NSW, Australia

The editors of this volume are grateful to the reviewers who provided valuable comments, which contributed to the high quality of papers in the ISPRS Archives: Giorgio Aguiaro (The Netherlands), Mitko Aleksandrov (Australia), Behnam Atazadeh (Australia), Jack Barton (Australia), Filip Biljecki (Singapore), Roland Billen (Belgium), Susanne Bleisch (Switzerland), Pawel Boguslawski (Poland), Martin Breunig (Germany), Eliseo Clementini (Italy), Arzu Çöltekin (Switzerland), Volker Coors (Germany), Sagi Dalyot (Israel), Jose-Paulo de Almeida (Portugal), Youness Dehbi (Germany), Lucía Díaz Vilarinho (Spain), Efi Dimopoulou (Greece), Claire Ellul (UK), Tarun Ghawana (India), Ben Gorte (Australia), Lars Harrie (Sweden), Petra Helmholtz (Australia), Mike Horhammer (USA), Sungsu Jo (Australia), Jamal Jokar Arsanjani (Denmark), İsmail Rakip Karas (Turkey), Thomas Kolbe (Germany), Paul Vincent Kuper (Germany), Shawn Laffan (Australia), Hugo Ledoux (The Netherlands), Wei Li (China), Martijn Meijers (The Netherlands), Azarakhsh Rafiee (The Netherlands), Monica Sester (Germany), Sara Shirowzhan (Australia), Wei Tu (China), Giuseppina Vacca (Italy), Anh Vu Vo (Ireland), Zhiyong Wang (China), Stephan Winter (Australia), Dong Keun Yoon (South Korea), Qing Zhu (China), Sisi Zlatanova (Australia).