

Innovations in the Geospatial Data Technologies

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ABSTRACT

Rapid technological advances in all areas of modern life such as - aerospace technology, robotics (and robotics in medicine in particular), computer science, Nano-scale electronic engineering, web and wireless technology, laser and the infrared systems - to name a few, mainly since the second half of the 20th century, affect mankind and its life. These major technological developments affect, inter alia, the surveying, mapping and geographic information communities and their implications are extremely significant. During the past 1-2 decades new advanced hardware systems and sophisticated geospatial processing algorithms have been developed, thus affecting dramatically the traditional methods for geospatial data collection and geospatial data processing. Major technological developments in geospatial data collection (such as the LiDAR technology, the Hyper-spectral imagery, Crowdsourcing technology – to name a few) as well as 2D, 3D and even 4D geospatial data integration and analysis have been introduced - all that - as part of the ICT revolution. These new data acquisition technologies as well as methods, algorithms and software packages, have allowed surveyors, computer experts and the mapping community to provide rapid and frequent updating, integration and analysis of existing geospatial databases, and moreover, deal with data volumes, resolution levels, and accuracies that were unknown until recently. These new spatial and geospatial tools and techniques enable to integrate the social, economic and environmental factors into the geospatial information – all within shorter timeframes than previously were possible or known. Data collection and maintenance of high resolution airborne and satellite imagery which is now available at an affordable rate, together with LiDAR data, and crowdsourcing geospatial data acquisition, opens up the possibility to efficiently generate topographic, planimetric and thematic mapping at very detailed scales and to better understand changes across our globe. Data integration and access techniques together with interoperable algorithms enable real-time merging of data and services from a variety of sources and leads to an innovative re-use of spatial information. The paper will describe the spatial innovations and their implementations as to efficient handling of urban regions in general and for responsible governance capabilities in particular.

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