New approach to data visualization, automated object recognition and urban management based on laser scanning and photo panoramas

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This article is devoted to a new approach to the development of a system of 3D visualization of urban spaces and automated recognition of urban objects based on laser scanning data, photo panoramas and construction of three-dimensional models of cities (by identification of separate objects in city panoramas in automated mode and recovering from it 3D city models). The system may become an integrational platform for smart city, connecting all the data in one view point. It is also a useful tool for urban city management for city planning and maintenance. This kind of platform can be a very useful to perform urban city management, planning tasks as well as make a significant improvement in communication between citizens and institutions. To create this type of solution, the following problems were solved through automated data processing from mobile scanning equipment of standard type (for example Trimble, Topcon, etc.). Approaches for urban environment visualization were found to make it in the most perceivable way for different users and purposes (municipalities and citizen, games, education, augmented reality, etc.). Object recognition from point cloud in automated mode was developed to be used for a city modelling and other practical tasks (urban asset inventory, control and maintenance over the urban infrastructure objects and buildings, etc). Tools to integrate data from all sources to create a “one window” solution – a Smart City platform. Several algorithms for analyzing the city environment are available and new can ones be developed by requirement (navigation, measurement of objects in panoramas, objects embedding for territory planning purposes; objects identification; objects comparison, data comparison, retrospective analysis to compare different time periods, etc.). The proposed solution is operative as an average European city can be scanned and processed within 2–3 weeks. This solution is very light to be used in mobile and web applications and will be appropriate for any user without the need of any special training to use the system.

Biography

Katerina Mekhlis has completed her PhD at the age of 26 from St. Petersburg State University, master degree at UAB (Barcelona), postmaster program Viadrina University (Germany). She is a CEO of NeoCityLab an IT GIS company specialised in data processing of laser scanning. She has an experience as a project leader for system implementation (incl. system design and implementation of ERP systems: SAP, Navision, Axapta etc.) in International Corporations such as Heineken, Henkel, Fraport, other companies.

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