# LSGI Scholars excel at Geneva Inventions Expo

In a special virtual edition of the 48th International Exhibition of Inventions of Geneva, the Inventions Geneva Evaluation Days were held from 10 to 14 March 2021. Gold Medals have been awarded to Prof. John Wenzhong Shi and Dr Charles Man-sing Wong of the Department of Land Surveying and Geo-Informatics (LSGI) for their smart city platform and smart monitoring system for urban tree management respectively. Project "Seamless Navigation in Urban Environment" led by Prof. Wu Chen, Head of LSGI, and funded by Logistics and Supply Chain MultiTech R&D Centre (LSCM), received the Silver Medal. They were among the seven PolyU awardees and projects honoured at the virtual event.

1. [Project: Smart City Platform: A Comprehensive System for Spatial Data Infrastructure](#)

PI: Prof. John Wenzhong Shi (LSGI)

The smart city platform can be used to create digital city replicas for acquiring insights into urban situations, testing solutions and conducting technological research.
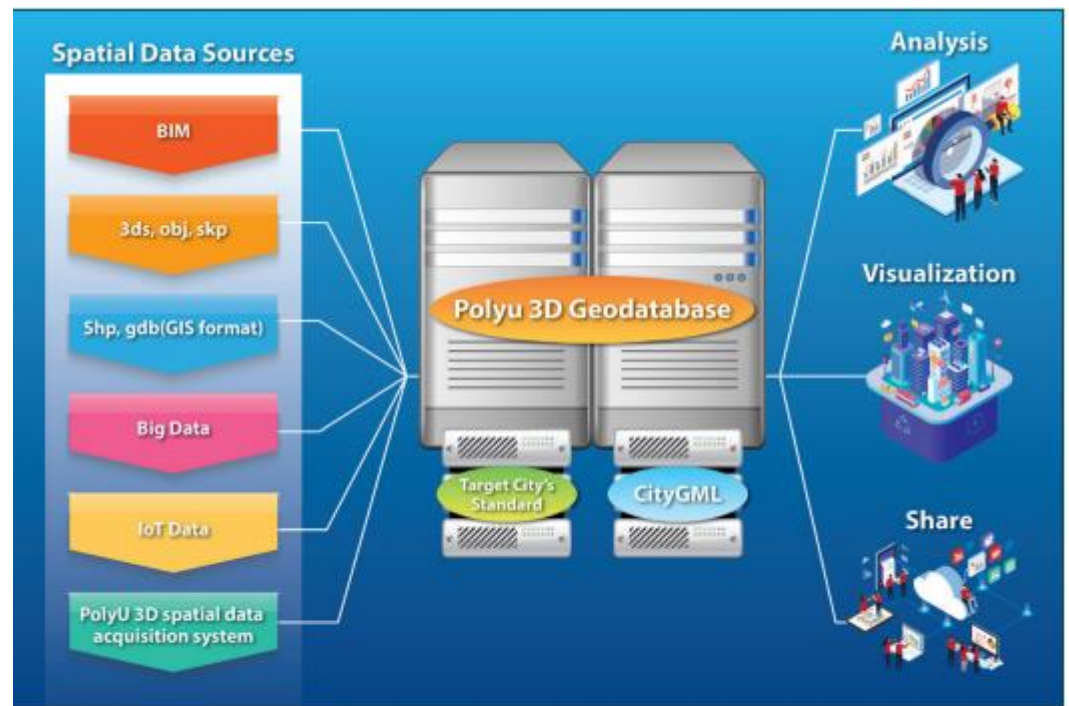
Framework of the smart city platform
智慧城市平台

Incorporating 3D city modelling, AI-based urban object cognition, web-based visualisation and analytics technologies, it enables seamless fusion of massive geometrical information, 3D LiDAR data, image data and spatial big data from various sources, including public and private agencies, to provide a realistic and accurate representation of a city. A 3D spatial data acquisition system has been specially developed to enhance both outdoor and indoor 3D environment of buildings. It can

identify indoor objects and automatically reconstruct a digital model (Building Information Model) of the indoor environment from raw LiDAR data.

2. Project: Smart Monitoring System for Urban Tree Management

 PI: Dr Charles Man-sing Wong (LSGI)

The smart monitoring system for urban tree management makes use of smart sensing technology and geographic information systems to monitor the stability of local trees. Tailor-made sensors are installed on the lower trunks of selected urban trees to monitor their tilting angles. The data collected has facilitated timely mitigation measures for sustaining longer tree lives.

The LSGI team behind the Smart Monitoring System for Urban Tree Management

Our researchers devote their innovative research to changing human life. This recognition gave strong support for them to advance their research in related area and application.

3. Project: Seamless Navigation in Urban Environment

⊕ **Global coverage** ⊕ **High accuracy** ⊕ **Low cost** ⊕ **Wide applicability**
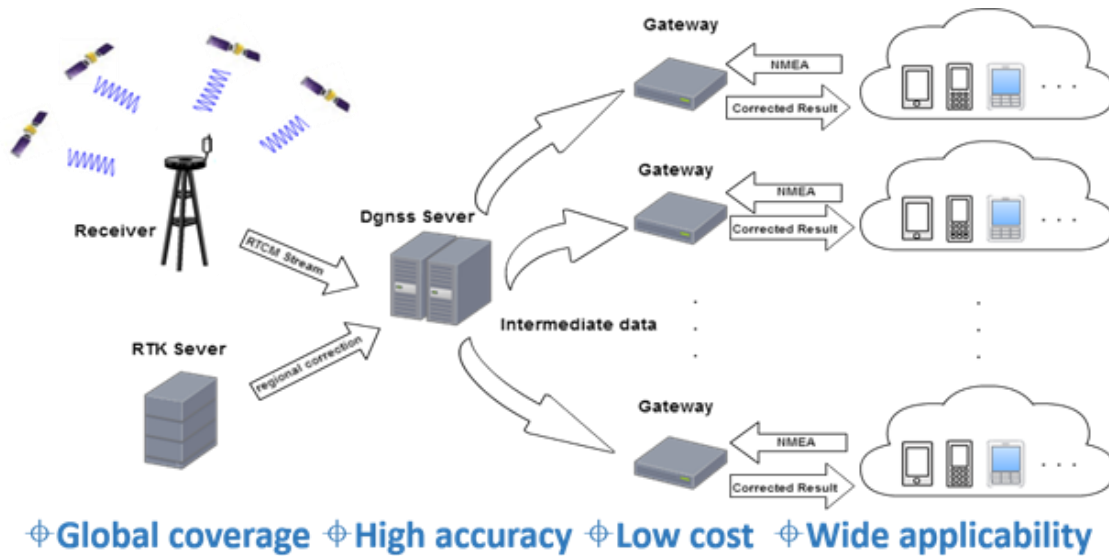
PI: Prof. Wu Chen (LSGI)

This research developed technology to improve mobile phone positioning accuracy with reasonable cost. It enables the positioning to achieve an accuracy of 2 metres in open areas, and less than 10 metres in dense urban areas, for mobile phone-based and location-based services. It uses a position-domain DGNSS (Differential Global Navigation Satellite System) platform with an accuracy of 2 metres, the multipath mitigation engine with the integration of GNSS observation, Microelectromechanical Systems (MEMS) inertial sensors and a 3D map for greater accuracy in positioning.

Congratulations!

PolyU's press release: https://polyu.hk/fuxrW

LSCM's release: https://www.lscm.hk/files/content/file/content-50963-file_eng.pdf