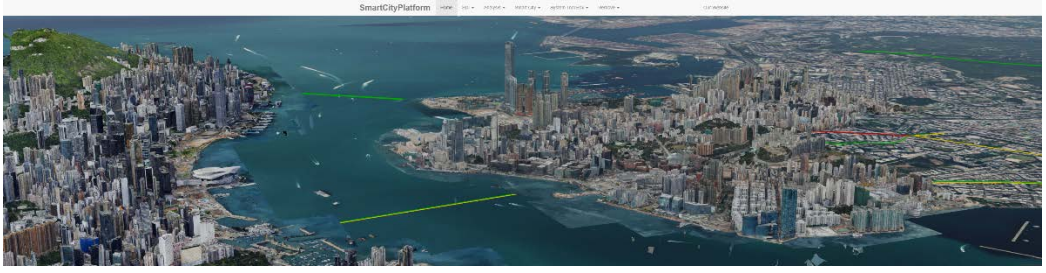
Appendix

PolyU's winning projects at "Inventions Geneva Evaluation Days – Virtual Event"

(1) **CareCoatex™: A Biomaterial-based Core-Shell Particles for Safe and Effective Antibacterial and Antiviral Applications**
Principal Investigator: Prof. Pauline Pei LI, Department of Applied Biology and Chemical Technology, Co-founder of Grand Rise Technology Limited (a PolyU-supported startup)
CareCoatex is a biocompatible, non-toxic and eco-friendly antibacterial and antiviral coating that can perform both contact killing and time-release killing for up to 6 months. It can effectively and rapidly kill 99% of common bacteria (e.g. Staphyloccocus aureus) and viruses (e.g. H1N1 and HCOV-229E), and is therefore ideal for applications like disinfection, contamination control and epidemic prevention. CareCoatex can be easily applied by spraying under room temperature and normal conditions on various surfaces. It is fast-drying and will not affect the material's appearance and tactile feel.

CareCoatex™

(2) **Smart City Platform: A Comprehensive System for Spatial Data Infrastructure**
Principal Investigator: Prof. John Wenzhong SHI, Department of Land Surveying and Geo-Informatics
Incorporating 3D city modelling, AI-based urban object cognition, web-based visualisation and spatial big data analytics technologies, this platform enables seamless fusion of massive geometrical information, 3D LiDAR data, image data and spatial big data to create realistic and accurate digital city replicas. It can be used for analysing and acquiring insights into urban situations, testing solutions and conducting technological research, facilitating smarter decision-making by governments, the general public and private companies.

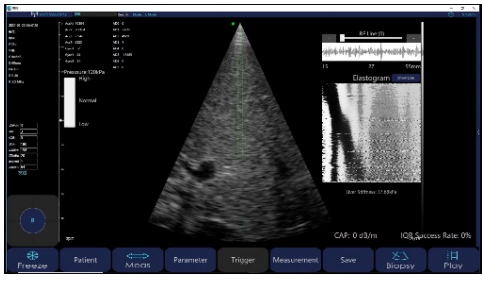


Smart City Platform

(3) **Smart Monitoring System for Urban Tree Management**
Principal Investigator: Sr Dr Charles Man-sing WONG, Department of Land Surveying and Geo-Informatics
This monitoring system employs smart sensing technology to measure tree tilt and displacement. The locations of the trees and data of its surrounding environment can be identified using the GIS-based platform for quantifiable analysis of the trees' root plate movement. It is also equipped with AI algorithms and Spatial Big Data analytics, which can evaluate the leaning trend and its potential risk factors correlated to tree failure. The system enables large-scale monitoring of tree stability, allowing timely and appropriate mitigation measures to be taken.

Tailor-made remote sensors installed on the lower trunk of urban trees

(4) **Liverscan: Palm-sized Real-time B-mode Ultrasound Imaging Guided System for Liver Fibrosis Assessment**
Principal Investigator: Ir Prof. Yongping ZHENG, Department of Biomedical Engineering, Founder of Eieling Technology Limited (a PolyU-supported startup)
Liverscan is a palm-sized tool for detecting and staging liver fibrosis, especially in the early stage of the disease, through non-invasive measurement of liver stiffness. The system features a PolyU patented technique of real-time image guided process of transient elastography that enhances the accuracy of measurement. Moreover, its portable and wireless design allows convenient operation. It provides a safer, more effective and comprehensive diagnostic solution, and can be applied for screening, early diagnosis of liver fibrosis and treatment outcome monitoring.



Liverscan for non-invasive measurement of liver stiffness

(5) **A Smart All-electric Antilock Braking System (ABS)**
Principal Investigator: Prof. Eric Ka-wai CHENG, Department of Electrical Engineering
This all-electric Anti-lock Braking System (ABS) considers road conditions and calculates the maximum tire-road adhesion coefficient in order to control the angular wheel acceleration and generate an accurate braking torque with its electric control unit. Compared with conventional hydraulic ABS, this all-electric system is more environmentally friendly, safer, more responsive and more accurate in braking torque control, thus effectively shortening the braking distance and time.

All-electric Antilock Braking System

(6) **Biomimicking Photocrosslinkable Nanocomposite Bone Graft**
Principal Investigator: Dr Xin ZHAO, Department of Biomedical Engineering
The novel photocrosslinkable nanocomposite can be rapidly fabricated into bone graft materials that resemble natural bone structure under UV at 36°C. The low temperature and organic solvent-free fabrication allows it to be loaded with, preserve and perform long-term release of bioactive molecules, e.g. growth factors. It promotes bone regeneration and activates cell signalling pathways to facilitate osteogenesis and angiogenesis simultaneously while providing optimal mechanical support to the injured area, accelerating the recovery of bone injuries and fractures.

Biomimicking Photocrosslinkable Nanocomposite Bone Graft