

A lab to study cities of the future

In another 20 years, 60 per cent of the world's population, about five billion people, will be living in cities. According to the United Nations agency for human settlements, UN-Habitat, the complexity of urbanisation will become even more pronounced for urban planners worldwide. A joint project in Singapore undertaken by the Swiss Federal Institute of Technology Zurich (ETHZ), NTU and another academic partner seeks to develop ways and means to support the global population shift.

There is a need for transdisciplinary research on future cities, and the growing importance of having sustainable solutions for the future. For these reasons, the Future Cities Lab was envisaged by the National Research Foundation more than four years ago as a collaborative effort between ETH Zurich, NTU and NUS, with the NTU component coordinated by **Associate Professor Ian McLoughlin** from School of Computer Engineering (SCE) and **Associate Professor Lim Kee Yong** from School of Mechanical and Aerospace Engineering (MAE). Since then, many NTU faculty have provided input, assistance, and ingenious ideas to turn this linkage into a reality.

Finally launched in September 2010, under the CREATE programme, The

Singapore-ETH Centre for Global Environmental Sustainability (SEC) is busy ramping up multi-institution interdisciplinary projects in areas of low energy (which maps to smart buildings), urban mining stocks, urban design strategies, urban sociology, territorial organisation, landscape ecology, mobility/transportation and simulation. Although NTU does not have school of architecture or urban planning, we have faculty working on a number of technology aspects that are relevant to this research programme, particularly within ERI@N, EOS and NEWRI.

One of the most active areas of NTU contribution to this ongoing and growing research collaboration is in the field of simulation and visualisation. This includes simulation of urban structures, city models and so on, and the display of information pertaining to this. It includes the display of information such as pedestrian movements, traffic patterns and so on. With greater amounts of data becoming available, methods of accessing and viewing that data naturally increase in importance. **Dr Stefan Müller Arisona** of ETH Future Cities lab is working closely with several NTU faculty and students to construct better and clearer visualisations - these approaches depart from existing static graphs and tables of numbers by

allowing an immersive 2.5D or pseudo 3D component to be accessed, as well as appearing as particularly beautiful data representations in their own right. The latest project in this area, in conjunction with **Associate Professor Ian McLoughlin**, is to extend this data representation availability to mobile devices: to allow city planners to access and manipulate large amounts of viewable data remotely or individually.

This project builds upon the success of the EOS GeoTouch multi-touch display panel as invented by **Associate Professor Goh Wooi Boon** and **EOS Research Assistant Linus Ang Li Ming**, and extends this into a mobile dimension.

GeoTouch-II, the latest generation of the system, is a touchscreen wall portal for a variety of geospatial information. It uses numerous databases of maps, images, geological data and ties into many earth science research project (for which it acts as the public display medium). Many Singaporeans will have seen this featured on CNA during explanations of earthquake and tsunami events. GeoTouch-II can be found in EOS (N2-01a), and is an open-access resource free for use by anyone with an interest in exploring the earth sciences.



^ GeoTouch-II display showing multiple variable-transparency overlay windows of mapping, image and geological data.