Orianna as Key Technology Partnership Visiting Fellow at University of Technology Sydney

Dr. Orianna Guo, our Scientific Officer at Ng Wing Hong Sustainable City Laboratory (SCL), was invited to commence research as a Key Technology Partnership Visiting Fellow by Dr. Pernille Christensen, Senior Lecturer at the School of Built Environment (SBE), University of Technology Sydney (UTS) from 14 to 27 February 2016.

UTS has joined the Hong Kong Polytechnic University (HKPU) in a new research venture that uses 3D modelling technology to improve sustainability outcomes in urban renewal projects. The research aims to use 3D spatial analysis technology based on 3D models from our Ng Wing Hong Sustainable City Laboratory to measure the impacts of relaxed building restrictions on development sites in Hong Kong and Sydney.

Like many global cities, Hong Kong and Sydney are suffering from a chronic lack of land resources, housing supply and the impacts of high density urban development. As developers in both cities push for the relaxation of maximum plot ratios and building height restrictions, we need to investigate the impacts from a sustainability perspective. Most people can't visualize the impact of relaxed height restrictions from a 2D drawing but by using this kind of 3D modelling technology you get a more holistic view, which means we'll be able to make more effective and efficient decisions. Many cities in the Asia Pacific region are confronted with the challenges of urban redevelopment as growing economies like China and India experience rapid urbanisation.

At HKPU, we have been using 3D models to help us do 3D analysis of the redeveloped old Kai Tak airport site. This includes looking at solar exposure, shadows, the wind ventilation and air temperature, ridgeline of the mountain as well as the skyline of the city and what impact these things have for the surrounding suburbs if we increased the plot ratios and building heights. When applied on

similar redevelopment areas in Sydney we think we will find similar results. From there we will be able to develop some informed strategies for other global cities facing similar issues with urban development.

During her two-week visit, Dr. Guo gave a public speech, met with the SBE faculty, staff of Center for Local Government, academics in the CRC Low Carbon Living (UNSW and UniSA) and staff in the City of Sydney, visit some centres and special buildings, and commenced preliminary fieldwork at several redevelopment sites in Sydney. Dr. Guo presented to the SBE staff and PhD students on 24 February, 2016. She presented an overview of the Ng Wing Hong Sustainable City Laboratory and showed the research currently being undertaken, with particular focus on the Kai Tak redevelopment project. Her title '**A Study of Plot Ratio/Building Height Restrictions in High Density Cities Using 3D Spatial Analysis Technology: A case in Hong Kong'** was very interesting to our staff and has initiated dialogue with SBE staff who are also engage with 3D Spatial Analysis Technology. Coming to the SBE, she has met with a lot of staff and discovered staff with a similar background and interest area to her. Her visit also sparked interest with other members of the SBE who are eager to collaborate with HKPU's SCL.

Similarly, local site (Parramatta Square) was preliminary identified for the comparison study. A 3D model will be built of this study area and analysis of micro-climate conditions (e.g. sun/shade, wind speed and direction, and air temperature) will be investigated for the study area. Results will be compared to the results at Kai Tak. In addition, discussions with City of Parramatta planning department related to benefits of using 3D technology for built environment decision making.

In addition, the Joint PhD Program and more exchange programs between the two Universities (UTS in Sydney and HKPU in HK) were also discussed. Dr. Guo also invited Prof. Lee and one PhD student to give BRE staff presentations when they visit HK during this year.

Participating in the KTP Visiting Fellow Program not only helped Dr. Guo find potential collaborations, but also broadened her views and opened her mind, which is very helpful for her future work and research. Her trip has solidified the developing relations between the two universities and accelerated collaboration in their shared areas of interest. This visit was the first step of long-term and multi-stage research collaboration between UTS and HKPU.

(from left) Dr. Orianna Guo and Dr. Pernille Christensen, Senior Lecturer at the School of Built Environment, University of Technology Sydney

Dr. Guo was delivering a presentation on 'A Study of Plot Ratio/Building Height Restrictions in High Density Cities Using 3D Spatial Analysis Technology: A case in Hong Kong'

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