Cornelius Toh (left) with Associate Prof Dr Lau Sian Lun.

Researching excellence

SUNWAY University Department of Computing and Information Systems associate dean and head (Academic) Associate Prof Dr Lau Sian Lun recently won Best Paper at the sixth International Conference on Cloud System and Big Data Engineering held at the Amity University, Noida, India, in January.

The research paper titled "Wi-Fi Fingerprint Localisation using Density-based Clustering for Public Spaces: A Case Study in a Shopping Mall" was co-authored with Cornelius Toh, a Master of Science (MSc) in Computer Science (By Research) student, and Yasir Saleem, a research assistant.

The paper investigated indoor localisation using existing Wi-Fi infrastructure and commercial off-the-shelf (COTS) smartphones. Dr Lau presented their findings on the localisation accuracy using two density-based clustering algorithms as well as different improvements on the localisation algorithm.

"I started the research in indoor positioning using unobtrusive approaches back in 2010 with a Masters student at my previous university. I wanted to continue when I joined Sunway University in 2013 and was fortunate to receive a grant from Sunway Group in July 2014 to research on Wi-Fi-based localisation technology," said Dr Lau, who teaches various subjects related to programming, software design and networking.

On his co-authors, Dr Lau said, "Cornelius was one of our first class honours BSc (Hons) in Computer Science graduates in 2015. I taught Cornelius during his second year and found him an intelligent and hardworking student. He is technically equipped and independent. Yasir was also one of our MSc in Computer Science students. After he submitted his MSc thesis and prior to his graduation, I approached him to join my team. He proved to be a great asset. Yasir, who also graduated in 2015, is now a research engineer and PhD candidate at Telecom SudParis in France.

"We were also very fortunate to have a group of undergraduate students who helped in data-collection throughout 2015. Part of the data collection software was developed by Tey Kai Yik, BSc (Hons) in Computer Science graduate and Ronald Chia, a final year BSc (Hons) Information Technology student, both from Sunway University."

The research aims to provide an accurate technology that relies on commercial-off-the-shelf (COTS) devices and existing infrastructure, such as Wi-Fi access points and smartphones. Through self-learning techniques, such as a clustering algorithm, the system can build the knowledge of indoor locations by collecting Wi-Fi information using smartphones from the users in that particular environment. This may become an attractive alternative to current indoor localisation technology, if not a brand new solution.

Also as one of the invited keynote speakers at the conference, Dr Lau had the opportunity to share his research on crowdsourced-based open data for future smart cities.

Sunway University aims to make a real impact in the world. As such, the university places emphasis on the development of its research profile.

"The Department of Computing and Information Systems under the Faculty of Science and Technology is constantly looking out for good and motivated students to join our research and projects. For candidates interested in pursuing a Master of Science (MSc) or Doctor of Philosophy (PhD) at Sunway University, contact me to explore possible support to begin the new journey after your undergraduate degree", said Dr Lau.

The Faculty of Science and Technology at Sunway University offers students an excellent educational experience where they are encouraged to immerse themselves in an open academic environment through collaborations with the academic and research team with emphasis on building a strong lifelong foundation for successful careers and lasting friendships.

■ For details on the programmes under the Faculty of Science and Technology at Sunway University, log on to *http://sunway.edu.my/university/FST*, e-mail info@sunway.edu.my or call 03-7491 8622.