Researchers of the Hong Kong University of Science and Technology (HKUST) have developed a novel geofencing technology, offering a smart core solution that helps save the government’s manpower in monitoring those under compulsory home quarantine amid the novel pneumonia (COVID-19) outbreak.

With the pandemic spreading quickly across the globe, the Hong Kong government has issued quarantine order on people entering the city from all overseas countries and territories. As a compliance measure, people under quarantine have been required to regularly report their current real-time locations via instant messaging applications or answer surprise video calls from communication centers. This approach incurs high monitoring cost to the government, and brings much inconvenience to the home confinees.

In order to achieve significantly higher cost-effectiveness, a team of researchers and engineers led by Prof. Gary CHAN, Professor of the Department of the Computer Science and Engineering and Director of Entrepreneurship Center at HKUST, has innovated and designed an automated geofencing technology called “Signature Home”. The core technology has since been licensed to and deployed by Compathnion Technology Limited as a new mobile app called StayHomeSafe. The app has been used by the public since last
week (March 14, 2020) as a more resource-efficient and friendly way to monitor people under home quarantine. Paired with an electronic Bluetooth wristband worn on the quarantined person, the app can accurately detect whether the home confinee is complying with the quarantine order, and alerts the relevant authorities if not.

The key idea of Signature Home geo-fencing technology is that the collective signal variations within a certain location is unique to that location, forming its “signature”. The technology hence collects multifarious environmental signals such as Wi-Fi, Bluetooth and cellular in the dwelling place as its signature. If the newly collected signal variation deviates from the signature, it is very likely that the person has left the designated location. By continuously collecting and understanding the change of the basket of signals collected in a place using machine learning and data analytics techniques, Signature Home can intelligently adapt to evolving home environment to achieve accurate monitoring.

“I would like to thank the University for its support of my research and handling of Signature Home technology licensing. Through such technology innovation, transfer and deployment, research value can be exposed to make actual social impact. It is immensely fulfilling to contribute my home-grown technology back to our community, especially in this critical and challenging time,” said Prof. Gary Chan, who invented another indoor positioning technology which has been widely deployed in shopping malls and hospitals in the Greater Bay Area through Compathnion.

Mr. Arthur CHAN, Director and CEO of Compathnion as well as an HKUST graduate in the Department of Computer Science and Engineering, added, “It has been a great pleasure collaborating with Prof. Gary Chan and HKUST. With the geo-fencing technology, our app can more effectively safeguard public health. We are pleased that the HK government adopts our solution so that we can reciprocate to society in the most meaningful way possible.”

Founded in 2015 by Prof. Chan, Compathnion has become a leading company in its field of indoor positioning. The company has received numerous awards, and was funded by HKUST through the Technology Start-up Support Scheme for Universities (TSSSU) during its incubation period.

About The Hong Kong University of Science and Technology
The Hong Kong University of Science and Technology (HKUST) (www.ust.hk) is a world-class research university that focuses on science, technology and business as well as humanities and social science. HKUST offers an international campus, and a holistic and
interdisciplinary pedagogy to nurture well-rounded graduates with global vision, a strong entrepreneurial spirit and innovative thinking. HKUST attained the highest proportion of internationally excellent research work in the Research Assessment Exercise 2014 of Hong Kong’s University Grants Committee, and is ranked as the world’s best young university in Times Higher Education’s Young University Rankings 2019. Its graduates were ranked 10th worldwide and top in Greater China in Global Employability University Survey 2019.

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All people entering the city from abroad who have to undergo quarantine will download the mobile app StayHomeSafe from March 14, 2020.

Prof. Gary Chan (fourth left, back) with Mr. Arthur Chan (fourth right, back) and the Compathnion team.