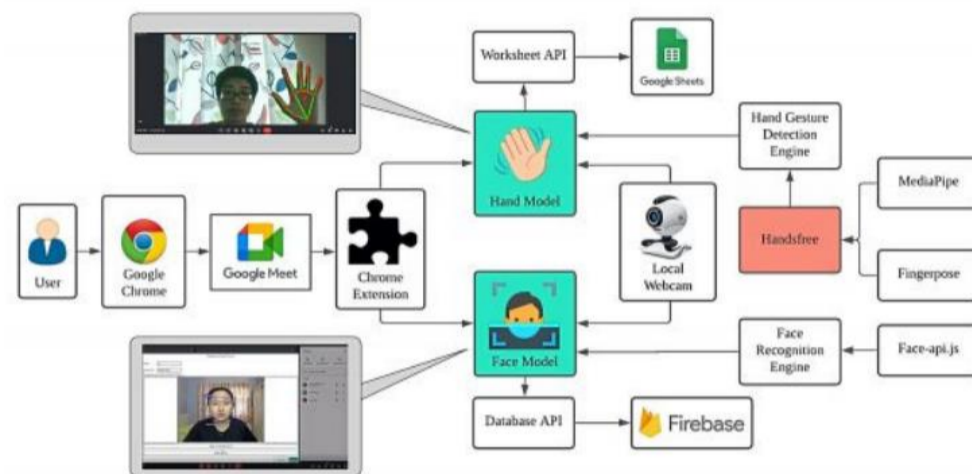# Sharing a Computationally Intelligent Future

COMPUTATIONAL intelligence (CI) is a subdomain of artificial intelligence (AI). Both are important in developing effective intelligent systems and products with smart functions.

At Tunku Abdul Rahman University College (TAR UC), the Centre For Computa tional Intelligence (CCI) is one of the research centres of the Faculty of Computing and Information Technology. The specific research projects in CCI are in fact final-year undergraduate projects with a focus on designing algorithms and techniques similar to the human way of reasoning. In addition to applying the knowledge learned in their undergraduate studies, students are also exposed to challenges and experiences that would help them develop important industry-relevant skills and competencies.

A final-year project by Joan Hau and Lim Kah Yee is about Intelligent Context Detection in Virtual Classrooms. The students, who are currently pursuing their Bachelor of Computer Science (Hons) in Software Engineering are working on using facial recognition features for tracking students' attendance.

In addition, the system consists of hand gesture recognition and tracking of activities. "The Face Detection and Recognition Attendance Module will be able to detect students' faces based on the system's facial database. This module will be a great help to educators in tracking attendance.

"For easy reference, students' attendance will be stored in a database where a Google spreadsheet can be generated," Lim explained. "We have also developed the Hand Gesture Recognition and Tracking Module. Once a specific gesture is recognised, the system will process and perform the necessary actions, eliminating the need to monitor each student in a virtual classroom.

"This module also enhances the communication channel between educators and students. For example, in a multiple-choice test, students can easily choose their answers through the system instead of each student sharing their answer," Hau detailed.

Another interesting and relevant research project is the Intelligent Visual Security Solution – Mask Detection and Face Recognition by two other Bachelor of Computer Science (Hons) in Software Engineering students, Foo Jia Ern and Hiew Long Shun, who are working with Advantech Co Malaysia Sdn Bhd, a global leader in the fields of Internet of Things (IoT) intelligent systems and embedded platforms. The project focuses on deep learning- based features with and without masks for the face recognition process with the implementation of IoT devices such as Raspberry Pi. The system also consists of a social distancing detector.

"The system will be able to detect those not wearing their face masks properly or not practising proper physical distancing and prompt the relevant authorities to take the necessary precautionary measures.

"This technology can also be used for safety surveillance, especially in identifying criminals who cover their faces with masks," Foo highlighted.

"While working on this final-year project, we learnt a lot about problem solving – implementing face detection and hand gesture recognition in a virtual classroom is challenging as it has not been explored before, especially in Google Chrome extension. "When there are errors in the system, a lot of time is needed to debug the system to find the best solution," Hiew said.

"This is an exciting project, more so as we are working together with Advantech. It has also broadened our exposure on how systems are

developed and deployed in the industries, which will certainly give us an added edge in our careers," Foo added.

To find out more about TAR UC's prog rammes in computing and information technology, visit www.tarc.edu.my/focs TAR UC's 2022 intakes are now in progress. Prospective students can submit their application online at www.tarc.edu.my Attractive scholarships are available on the basis of academic merit, as well as a sibling discount for qualified students.