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COVID-19 multitool opens communal doors, taps - minimises surface contamination

A novel multitool designed by a University of Cape Town (UCT) electrical engineering team will make opening doors and taps much safer for communities who rely on communal facilities but are wary of COVID-19 contaminating public surfaces.

The designers and developers of the tool for preventing the spread of COVID-19 were principal investigators Dr David Oyedokun and MSc candidate Kai Goodall. The tools are 3D printed with PLA filament (a thermoplastic polyester) and are 100% biodegradable to ensure sustainability.

The Tap and Door Opener Multitool can be used to open a number of different tap and door handle types without touching any of the shared surfaces, said Dr Oyedokun. However, it's not a replacement for soap and hand sanitisers or other COVID-19 prevention measures, he cautioned.

Some 2 500 units have been produced and are being distributed in townships across South Africa, thanks to funding from the Institute of Electrical and Electronics Engineers Humanitarian Activities Committee (IEEE HAC) and the Special Interest Group on Humanitarian Technology.

"There are a handful of IEEE COVID-19 projects around the world, and we are very proud that UCT is counted as one of the successful project hosts," said Oyedokun.

Features and design aspects include a protective cover for the active part of the tool to reduce accidental contact or contamination while it's not in use, a protective barrier between the safe or passive part of the handle and the active part of the tool, and an ergonomic user handle with a thumb indent for added grip support. The multitool can be cleaned using soap and water.

Dean of the Faculty of Engineering & the Built Environment, Professor Alison Lewis commented: "The COVID-19 pandemic has really highlighted the role of engineering in addressing health care problems. It has provided a platform for our engineers to develop innovative technical solutions that can benefit local communities. It also demonstrates the important relationship between medical practitioners and engineers."

Last month Oyedokun and Goodall donated the first batch of multitools to the Khayelitsha community through the Khayelitsha Metropolitan Police. Seventy units were also donated to the station for their members to use.

Owen Ntsasa, the director of the Khayelitsha Metropolitan Police, said that the tool would be useful to the community, especially the elderly, who are at greater risk. "I like the tool. I find it very light and easy to use."

A further donation of around 1 800 units is expected in the next few weeks, with educational videos and taps for demonstration to show community members how the device functions.

Led by postdoctoral research fellow (power system and transformer studies) Dr Hilary Chisepo, the chairperson of the IEEE Young Professionals Cape Town, a team of IEEE Young Professionals at UCT are managing the logistics of the mass distribution. They will also run a survey to gauge the impact of the tool within communities targeted for donations.

A spin-off of this project is that the team will demonstrate 3D-printing technology, engineering design and bringing innovation to reality to Khayelitsha high school learners.

This is yet to happen, said Oyedokun. But the idea came up when they visited the Khayelitsha Metropolitan Police office.

"This was discussed on site and there was mutual agreement with all parties that in addition to members of the community benefiting from the donation, it was even more important for [students] in their community to learn about bringing engineering designs to life. We hope this will provide the space to allow these students to create solutions to their community's needs, develop and sustain interest in engineering," said Oyedokun.



(From left) Owen Ntsasa, the director of the Khayelitsha Metropolitan Police with an elder from the community, Kai Goodall and Dr David Oyedokun at the donation of 2 500 multitools to the Khayelitsha community.

Photo: Kai Goodall

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