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UCT engineers create face shield easily made with household items

In response to the Coronavirus crisis, Associate Professor Sudesh Sivarasu and his team of biomedical engineers at the University of Cape Town (UCT) have been working on a variety of biomedical devices, including a face shield that can be made easily with household items.

The [ViZAR](#) is among the first of the team's COVID-19 solutions to have been approved by the South African Health Products Regulatory Authority. It acts as a first line of defence between the user and any infectious, airborne particles and offers protection against harmful aerosols, and prevents possible cross-contamination from users touching their faces.

The ViZAR was designed by postgraduate researcher Matthew Trusler, from the Division of Biomedical Engineering, in collaboration with Sivarasu, as well as Dr Stephen Roche of the UCT Division of Orthopaedic Surgery, Professor Salome Maswime and Dr Tracey Adams of the UCT Division of Global Surgery, and Saberi Marais from UCT Research Contracts & Innovation.



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"The UCT ViZAR project started off as a response to the overwhelming need to protect our clinicians and health workers against the tide of COVID-19 infections and quickly turned into an in-depth look at why the current solutions weren't working. We hope to reach as

many South Africans as we can with all of our technologies from the Medical Devices Lab, and this is certainly a step in the right direction,” said Trusler.

To ensure maximum comfort for the user, the team focused on user-centred features, such as a shield transparent enough to prevent claustrophobia, foam lining along the top of the visor that conforms to the user’s forehead, and establishing the perfect length and width of elastic to minimise pressure.

An important aspect of the ViZAR design is that for manufacture the UCT team opted for a hand-made approach, using products that are easily available to make them more accessible. This allowed the team to scale their production to the order of a few thousand ViZARs a day, facilitating job creation through a sustainable and local supply chain.

Since being approved, the team has already manufactured over 13 000 of these ViZARs and thanks to funding from the Willis Foundation and the Harry & Doris Crossley Foundations, they have donated 2 000 ViZARs to Groote Schuur Hospital, 5 000 to the Western Cape Department of Health, and 500 to District Six Community Health Centre – with more donations to follow. The team is in the process of making another 20 000 and aims to raise funds for another 100 000 units in the next couple of months.

Making a ViZAR requires materials like an overhead projector transparency, elastic, foam and double-sided tape. All in all, a simplified DIY mask can be made according to the UCT ViZAR specifications with materials costing no more than R10.

“Our team’s philosophy has been to collaborate closely with other innovators in an effort to create technologies that are appropriate to our African context,” said Sivarasu, an associate professor of biomedical engineering in the Faculty of Health Sciences at UCT.

Being heavily reliant on material coming from abroad – especially China and elsewhere in the east – African innovators have had to turn their attention to what’s available locally and will have to continue doing so for the foreseeable future.

“Now that this is a challenge, it’s not a time to buckle to the pressure, but rather to be creative and innovative in the way we approach and solve this problem,” said Sivarasu.

The Central University of Technology (CUT) in Bloemfontein has stepped up as the manufacturing partner for the medical grade ViZARs, providing ISO 13485 quality management, which is required for the manufacture of medical devices.

“As our official manufacturing partners for the UCT ViZAR, the contributions of CUT’s team – headed by Dr Gerrie Booysen – have been invaluable,” said Sivarasu. “This is also just the beginning of much larger collaborations across higher education institutions in South Africa.”

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