BioSpectrum ASIA EDITION
the business of Bio & Health Sciences

Singapore invents interactive mouthguard for medical assistance and healthcare devices

17 October 2022 | News

This groundbreaking invention is sensitive in detecting bite forces, enabling users to control devices

A first-of-its-kind bite-controlled optoelectronic system has been invented by a research team led by Professor Liu Xiaogang from the Department of Chemistry at the National University of Singapore (NUS) Faculty of Science, together with collaborators from Tsinghua University.

Various assistive technologies such as voice recognition, eye tracking and brain-computer interfaces have been developed in recent years to help people, especially those with limited dexterity or neurological disorders, control electronic devices. However, these technologies have limitations associated with environmental interference, control accuracy, cost and maintenance.

To offer a promising alternative to existing assistive technologies, Prof Liu and his team have successfully designed and demonstrated a smart mouthguard containing integrated pressure sensors to detect occlusal patterns. These patterns are translated into data inputs with 98% accuracy, and can be used to control computers, smartphones and wheelchairs.

Besides supporting human-computer interaction, the interactive mouthguard can also be used for medical assistance, healthcare devices such as smart electronic skin, and dental diagnosis.

Each smart mouthguard currently costs S$100 to produce in the lab, and the team expects the cost to be reduced substantially in mass production. The research team has filed a patent for this innovative technology, and they are exploring opportunities to validate their device in a clinical setting, such as care centres or nursing homes.