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Hong Kong develops multiple smart devices to advance medical innovation

10 April 2025 | News

Seeking collaborations to advance these innovations further

A research team at the Hong Kong University of Science and Technology (HKUST) has developed three innovative smart medical devices- AI Hand-Centric Tactile Interaction System (PhyTac); A portable wireless spirometer device and World's Smallest Multifunctional Surgical Robot, for health monitoring, surgical assistance and rehabilitation.

Integrating artificial intelligence (AI) with robotics technology, the devices seek to help doctors address challenges in treatment and diagnostics, improve medical procedures and enhance efficiency.

PhyTac is a cone-shaped AI hand-centric tactile interaction system fitted with a maximum of 368 sensing elements that could correspond to the exact points of force exertion in the hand. This AI system can integrate with virtual reality (VR) technology to create interactive games, enabling the customized design of rehabilitation exercises and the development of personalised recovery plans.

On the other hand, the portable wireless spirometer, measuring just 8 cm in diameter and weighs approximately 78 grams—about half the weight of a typical smartphone, allows users to conveniently perform exhalation tests and perform breathing training at home. It can help ease the burden of frequent hospital visits for spirometry tests.

Further, the micro-robot integrates imaging and precise navigation functions, and can assist medical professionals in sampling tissues, delivering drugs, and performing laser thermal therapy within the human body.

Led by Associate Prof. SHEN Yajing from the Department of Electronic and Computer Engineering, the team is actively collaborating with public and private institutions, industry stakeholders and investors to promote the translation and clinical application of the three breakthroughs.