

Hong Kong develops smartphone stethoscope to support valvular heart disease detection

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Using AI to turn a regular smartphone into a doctor in your pocket



An interdisciplinary team from the Li Ka Shing Faculty of Medicine of the University of Hong Kong (HKUMed) has developed an innovative artificial intelligence (AI) software system that can turn an ordinary mobile phone into a medical-grade stethoscope, allowing anyone to use a smartphone to detect heart disease symptoms at their fingertips, and subsequently seek immediate medical attention, without the need for other specialised devices.

This patented AI technology enables the detection of valvular heart disease, with an estimated accuracy of 81%, a level comparable to a doctor's assessment using a stethoscope. This invention promotes early detection of valvular heart disease, personalised health management, heart disease screening, the use of telemedicine, and remote disease monitoring.

Cardiologist Dr Wong Chun-ka, Clinical Assistant Professor in the Department of Medicine, School of Clinical Medicine, HKUMed, has led a clinical study since December 2023 to validate the utility of this phone-based AI system at a local public hospital. Based on preliminary analysis of the first 363 participants enrolled in this ongoing study, the system achieves 97% accuracy in terms of heart rate estimation and 81% in terms of detection of significant valvular heart disease.

The team is planning the next phase of the study, with the aim of testing its use in a larger, more diverse population, covering more heart disease symptoms.

The HKU Laboratory of Data Discovery for Health has registered the product 'Vitogram®' in the medical device listing of the United States Food and Drug Administration (FDA), and established a spin-off company, called Vitome Limited, to commercialise the product.

"In addition to Hong Kong, we are working with partner healthcare organisations to launch the AI platform in overseas countries, like Singapore and Malaysia, in addition to extending the service to individual users", said the researchers.