PL-3

Digital Health: Malaysia Original

Prof. Patrick Then, PhD

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ABSTRACT

Computer scientists working with clinicians to produce digital systems empowering patients and clinicians were unheard of a decade ago. Digital health collaboration between a computer scientist Patrick Then at Swinburne University of Technology Sarawak Campus and consultant cardiologist Dr Alan Fong at Clinical Research Centre Sarawak General Hospital commenced their digital health research and development in 2008. Their research outputs have improved the efficiency of hospital care, improved health screening of the population, and empowered patients at the individual level. Artificial intelligence (AI) and data science algorithms were crafted especially for clinical purposes. These algorithms have classified and detected heart abnormalities based on stressed echocardiography. They were 1 of 5 invited speakers from Asia-Pacific at the inaugural Digital Summit by the European Society of Cardiology at Tallinn, Estonia in October 2019. Their award-winning health screening AI discovered unknown risk factors from the healthy population who developed diabetics. Eye for the Future encompasses state-of-the-art AI algorithms to detect retinal vein occlusion diseases at more than 90% accuracy. AI algorithms were further developed with innovations to detect covid19 from cough sounds. AI geofencing techniques were embedded in a fully automated Stay-Home-Notice surveillance system. This system was used by more than 3,000 users in Sarawak. With innovative engineering and automation, a monitoring system for body temperature and blood pressure was developed to keep patients and subjects to continue staying at home while sending their blood pressure and body temperature readings via their smartphone applications to the healthcare service providers. Consequently, patients reduce their commute that minimize close contact with contagious diseases such as covid19.

PL-4

Development of an AI-powered Mobile Phone Application for Early Detection of Oral Cancer

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ABSTRACT

Oral cancer is a major health issue among low- and middle- income countries due to the late diagnosis. Automated algorithms and tools have the potential to identify oral lesions by early detection of oral cancer. This talk will present a novel deep learning framework named Deep Oral Cancer (D'OraCa) to classify oral lesions using photographic images. In the first part, the talk will focus on how D'Oraca is developed with a mouth landmark detection model for the oral images and incorporate it into the oral lesion classification model as a guidance to improve the classification accuracy. In the second part, quantitative and qualitative results will be presented. Particularly, it will demonstrate the effectiveness of the mouth landmark detection model in guiding the classification model to classify the oral lesions into four different referral decision classes. Moreover, these results are consistent with findings by clinicians. In the last part, the talk will conclude with some insightful knowledge for future/potential researchers to work in this domain.