2014 PSTA WINNER CITATIONS

PRESIDENT'S TECHNOLOGY AWARDS 2014

(from left to right)
Professor Wynne Hsu, Professor Wong Tien Yin, Professor Lee Mong Li

Singapore Eye Research Institute, Singapore National Eye Center, Duke-NUS Graduate Medical School, National University of Singapore
School of Computing, National University of Singapore

"For their outstanding contributions to the development of novel ocular image analysis technology for the screening and evaluation of significant clinical problems in eye and vascular diseases"

Professor Wong Tien Yin, Professor Wynne Hsu, and Professor Lee Mong Li, assisted by their collaborators from NUS, Singapore Eye Research Institute (SERI), and the Institute for Infocomm Research (I2R), developed a suite of novel ocular image analysis technologies and designed the architectural platform for the innovative application of these technologies to detect and track the progression of three major eye diseases which cause blindness. The technologies can also be used to study systemic vascular diseases.

The core technology is the Platform for Ocular Image Screening and Evaluation (POISE) that encompasses a suite of advanced image analysis algorithms and innovative integration of these methods. These include programmes that have been developed for large-scale clinical use for eye diseases such as glaucoma, diabetic retinopathy and age-related macular degeneration as well as systemic vascular diseases such as stroke, heart disease, dementia, diabetes and hypertension. The technology has enabled monitoring and documentation of subtle alterations in the retina over time. This makes early recognition of such diseases possible before the onset of clinical symptoms, thus allowing physicians to detect disease early, monitor disease progression and track treatment outcomes.

Through automation of ocular image analysis, previously labor-intensive eye disease screening programs can now be scaled up with reduced cost and less resource. The technology has been successfully adopted by public primary healthcare clusters and has significantly improved productivity, reduced waiting time and over-referrals to specialists.

The team has benefitted from close collaboration with NUS, SERI and I2R colleagues. Their research and achievements have placed Singapore on the world map as a leader in ocular image analysis technology and development. The technology has been licensed to and used by several academic and medical centres and research institutions, including University College London, University of Wisconsin-Madison, University of Melbourne, University of Sydney, the Centre for Eye Research Australia, theCommonwealth Scientific and Industrial Research Organisation, Moorfields Eye

Hospital and Topcon Inc. Several joint research labs such as SAILOR - the SERI-I2R-NUS Joint Lab, and the ATLANTIA Topcon-I2R Joint Lab have been established to drive the next generation of advanced ocular imaging technologies.

This work has resulted in more than 30 patents, and 20 end-user licenses with companies, institutions and hospitals globally full commercial licenses with multinational companies) ;more than 300 publications and multiple international prizes and awards. These systems have been extensively applied to different populations and cohorts in Singapore, USA, Europe, Australia and other Asian countries, in more than 100,000 adults and children ranging from healthy, community-based populations to high risk patient groups.

For their outstanding contributions to the development of novel ocular image analysis technology for the screening and evaluation of significant clinical problems in eye and vascular diseases, Professor Wong Tien Yin, Professor Wynne Hsu, and Professor Lee Mong Li, are awarded the 2014 President's Technology Award.