Fighting Blindness with Technology

Institute for Infocomm Research (I²R) & Topcon Corporation to develop advanced technologies for earlier detection of eye ailments

1. **Singapore - 11 July 2013** – The eye disease glaucoma leads to blindness and has no symptoms in the early stages, earning it the nickname “silent thief of sight”. Regular eye examinations are essential for early detection and diagnosis of such eye diseases. A new collaboration between A*STAR’s Institute for Infocomm Research (I²R), and Topcon Corporation, Tokyo, Japan, a leading ophthalmic instruments and optometrics instruments manufacturer worldwide could soon make detecting major eye diseases in Singapore an easier task. The ATLANTIA (Advanced Technological Laboratory for A*STAR aNd Topcon’s Innovative Alliance) joint laboratory, located in I²R’s premises in Fusionopolis, will develop advanced technologies that can better detect major eye disorders and diseases such as myopia, glaucoma, and age-related macular degeneration (AMD).

2. Studies in Singapore have highlighted the extent of these disorders and diseases within our population:

   - **Myopia**: Singapore has one of the highest cases of myopia in the world. 28 percent of children as young as seven years old are myopic. Eight out of 10 Singaporeans who are 18 years and above are myopic¹.
   - **Glaucoma**: About 6 percent of the Singapore population suffers from chronic glaucoma and the disease accounts for 40 percent of blindness in Singapore.
   - **AMD**: AMD is the deterioration or breakdown of the eye's macula - a part of the retina that allows people to see fine details clearly. In Singapore, the overall risk of AMD is close to 5 percent, with males at higher risk than females. The risk increases with age, hitting 8 percent for those in their 60s and 16 percent for those in their 70s².

Such common eye ailments leading to visual impairment have a considerable economic and social impact on patients, healthcare industry and the government. Early detection can lead to better management and swifter treatment of such diseases. This could potentially reduce pain and suffering for patients.

3. Leveraging on the expertise and capabilities of I²R’s Ocular Imaging Programme and Topcon Corporation, the joint laboratory will develop automated intelligent technologies aimed at improving accuracies and reducing the time taken to detect eye diseases and disorders. These technologies will be able to automatically process and analyse eye images captured by ocular imaging equipment, to eventually identify the diseases accordingly.

4. The collaboration will allow for the future screening of glaucoma, myopia and AMD during routine eye checks at hospitals and at optical shops as an added convenience, as the technology can be embedded into eye screening machines.

5. In addition, a cloud based data management system will be co-developed in this joint laboratory to enable better integration of innovative software and hardware technologies to provide more widespread access for doctors, opticians and patients. The ATLANTIA joint laboratory will use Topcon’s Swept-Source OCT (Optical Coherence Tomography), a revolutionary imaging technology that enables eye doctors to view cross-sections of the eye and determine the underlying causes of eye diseases. The joint laboratory will also tap on I²R’s Ocular Imaging Programme’s vast experience and expertise on inter-disciplinary eye-related research using a suite of ocular imaging-based computer-aided diagnosis/screening systems for major eye diseases.

6. “It is a great pleasure to establish a joint laboratory with I²R. For early detection of eye diseases, Topcon is developing the cloud based eye screening and management system. I²R has capabilities in developing the image recognition software from horizontal and cross-sectional ocular images which can be incorporated into our system. We acknowledge I²R’s further potential to make mutual growth for early detection of eye disease. ” said Mr. Yasufumi Fukuma, President of Eye Care Company, Topcon Corporation.

7. “Our eyes are the windows to the world. Early detection of eye diseases such as glaucoma, myopia and age-related macular degeneration can potentially reduce healthcare costs and prevent and reduce pain and suffering for the patients. We are very happy to work with Topcon Corporation to develop a wide spectrum of capabilities to help detect these common eye ailments before they deteriorate and cause loss of sight,” said Dr. Tan Geok Leng, Executive Director, Institute for Infocomm Research (I²R).
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About Institute for Infocomm Research (I²R)

Singapore’s largest ICT research institute, I²R (pronounced as i-squared-r) is a member of the Agency for Science, Technology and Research (A*STAR) family. Established in 2002, our vision is to power a vibrant and strong infocomm ecosystem in Singapore. We seek to foster world-class infocomm and media research and develop a deep talent pool of infocomm professionals to power a vibrant knowledge-based Singapore. At I²R, intelligence, communications and media (ICM) form our 3 strategic thrusts. We conduct mission oriented research to address key challenges faced by Singapore and the society at large. I²R performs R&D in ICM technologies to develop holistic solutions across the ICM value chain. Our research capabilities are in information technology, wireless and optical communication networks, interactive and digital media, signal processing and computing. We believe the greatest impact is created when research outcomes are translated into technologies our partners can readily deploy for a competitive advantage. For more information about I²R, please visit www.i2r.a-star.edu.sg.

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The Agency for Science, Technology and Research (A*STAR) is the lead agency for fostering world-class scientific research and talent for a vibrant knowledge-based and innovation-driven Singapore. A*STAR oversees 14 biomedical sciences and physical sciences and engineering research institutes, and six consortia & centres, located in Biopolis and Fusionopolis as well as their immediate vicinity. A*STAR supports Singapore’s key economic clusters by providing intellectual, human and industrial capital to its partners in industry. It also supports extramural research in the universities, and with other local and international partners. For more information about A*STAR, please visit www.a-star.edu.sg.
About Topcon Corporation

Topcon operates three in-house companies, an Eye Care Company, a Smart Infrastructure Company and a Positioning Company, with integration of the optical technologies it has nurtured since its foundation in 1932 and the latest digital technologies. As the world’s leading brand of ophthalmic instruments, its Eye Care Company has developed a wide range of ophthalmic instruments and systems for eye examination, measurement, diagnosis and treatment. Recently, it has been focusing on the development of system solutions, advanced ophthalmic medical instruments, diabetic screening and other preventative medical devices. For more information about Topcon, please visit www.topcon.co.jp/en/.