

MEDIA RELEASE

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MULTI-DISCIPLINARY RESEARCH PROGRAMME IN FUTURE HOME SYSTEMS & TECHNOLOGIES PIONEERED BY A*STAR

A*STAR's HOME2015 research programme focuses on research in future home systems and technologies

Imagine showing friends your family photos in holographic 3-D realism? Ever thought of installing a medical diagnostic system that can detect your state of health in your home lavatory? While such features are not commonplace in any home today, having them in future could promise a life of ease and convenience at home.

In fact, these are just some of the potential applications under eleven research grants awarded by A*STAR's Science and Engineering Research Council (SERC) totalling S\$8.7 million to research teams from A*STAR's research institutes, National University of Singapore (NUS) and Nanyang Technological University (NTU).

These grants were recently awarded under a national research programme that is focused on research in future home systems and technologies. Called the HOME2015 research programme, this is SERC's first inter-research institute collaborative initiative. As the home of the future requires a wide range of technologies, this initiative aims to promote cross-disciplinary research across the A*STAR research institutes, local universities, as well as industry partners. The programme is to build key enabling technologies, foundations, frameworks, building blocks and studies for the future home. The grants awarded will also go towards developing human capital and infrastructure in this area.

The HOME2015 programme is in its first phase. Over the next two years, these eleven projects (listed in Annex A) would seek to research and develop revolutionary and evolutionary technologies. We feature insights into some of these research projects.

Healthcare is becoming an increasingly pertinent concern, especially in many rapidly ageing societies such as Singapore. A research team led by the Institute for Infocomm Research (I²R) hopes to contribute to the area of in-home healthcare with their project entitled “**Home-Based Medical Diagnosis System for Detecting and Monitoring Selected Illnesses and Diseases**”. They aim to build a prototype which will diagnose if a user has kidney problems by analysing the appropriate biomarkers in urine samples.

Another team, led by the Institute of Microelectronics (IME), hopes to help patients recuperating at home after a medical procedure, such as a surgery, to monitor their health in a convenient way. Their project, “**Wireless Health-Monitoring System for the Home**”, will be creating a prototype that can acquire ECG & heart rate measurement data of a person wirelessly. This prototype features a sensor node that can be attached to a patient to acquire such data and transmit it wirelessly to his PDA.

The Data Storage Institute (DSI) is leading another project entitled “**Portable Holographic 3D Display for Mobile Devices**” which will be developing an experimental holographic 3D display system to display monochrome dynamic holograms at near video rates. Such a display technology might enable you to store your family’s photos in a 3D format in future.

“**A Configurable Multimodal Robot for Future Homes**”, a project led by I²R, will research the possibility of a configurable robotic platform that can be deployed in future homes. This platform will enable the development of sensory capabilities in robots with the intelligence to recognise speech and gesture activated commands in an indoor home environment.

Through the HOME2015 programme, ultimately it is hoped that cutting-edge research would be translated into innovative and integrated future home technologies that will help accelerate the development of home-related industries in Singapore.

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About HOME2015

The Home2015 programme is a collaborative research programme funded by the Science & Engineering Research Council (SERC) of the Agency of Science, Technology And Research (A*STAR). It is an integrated and multi-disciplinary research programme that aims to create systems and technologies for future homes.

About the Agency for Science, Technology and Research (A*STAR)

A*STAR's mission is to foster world-class scientific research and talent for a vibrant knowledge-based Singapore. The Agency comprises the Biomedical Research Council (BMRC), the Science and Engineering Research Council (SERC), the A*STAR Graduate Academy (A*GA), a commercialisation arm, Exploit Technologies Pte Ltd (ETPL) and supporting planning and administration divisions.

The Science and Engineering Research Council (SERC) funds and oversees 7 public research institutes in areas such as chemical sciences, materials, high performance computing, information technology and communications, manufacturing technology, microelectronics and data storage.

For more information, please visit: www.a-star.edu.sg

Annex A

Successful applications for the HOME2015 programme's research grants

S/No.	Project Title	Principal Investigator	Co-PI/Collaborators
1.	Si MEMS (Microelectromechanical systems) based energy harvesters for wireless medical sensor nodes	Lee Chengkuo, Vincent (IME)	Collaborator: Winston Seah (I ² R)
2.	A Wireless health-monitoring system for the home	Teo Tee Hui (IME)	Co-PI: 1. Tan Wee Tiong (I ² R) 2. Pradeep Kumar Gopalakrishnan (IME) Collaborators: 1. Ting Choon Meng, (HealthSTATS Int'l Pte. Ltd.) 2. Philip Wong, (National Heart Centre, Singapore)
3.	CROP: Data communication and distribution system within smart home using powerline with cognitive intelligence	Oh Ser Wah (I ² R)	Co-PI: 1. Zheng Yuanjin (IME) Team members: 1. Zeng Yonghong (I ² R) 2. Syed Naveen Altaf Ahmed (I ² R)
4.	Low-power UWB transceiver for low-rate to mid-rate wireless personal area networks	Francois Chin (I ² R)	Co-PIs: 1. Zheng Yuanjin (IME) 2. Kwok Yuen Sam (I ² R) 3. Mangalam R Shajan (I ² R)
5.	Home-based medical diagnosis system for detecting and monitoring selected illnesses and diseases	Zhou Xiaoqun (I ² R)	Co-PIs: 1. Cheng Tee Hiang (NTU) 2. Wang Lian Hui (IMCB) 3. Han Ming Yong (IMRE) 4. Liu Ai Qun (NTU) Collaborators: 1. Zhang Lian Hui (IMCB)

S/No.	Project Title	Principal Investigator	Co-PI /Collaborators
6.	Smart Bed For Vital Signs Monitoring	Yang Xiufeng (I ² R)	Co-PI: 1. Zhang Xiao (SIMTech) 2. Chen Zhihao (I ² R)
7.	A Configurable multimodal robot for future homes	Li Haizhou (I ² R)	Co-PI: 1. Krishnan Sivanand (I ² R) 2. Li Liyuan (I ² R) 3. Tan Yeow Kee (I ² R) 4. Yu Xinguo (I ² R) Collaborators: 1. Ong Jiun Keat (SIMTech)
8.	Bridging Gaps between Smart Homes and their Users in Singapore through Human Factors Engineering	Jamie Ng Suat Ling (I ² R)	Co-PIs: 1. Yap Min Yi, Daniel Francis, (SIMTech) 2. Martin Helander (NTU)
9.	An Intelligent mmWave Platform for Home Entertainment and Assistive Technology	Lin Fujiang (IME)	Co-PIs: 1. Guo Yong Xin (I ² R) 2. Ooi Ban Leong (NUS) Collaborators: 1. Xiong Yong Zhong (IME) 2. James Brinkhoff (IME) 3. Michael Ong (I ² R)
10.	Portable Holographic 3D Display for Mobile Devices	Xu Xuewu (DSI)	Co-PIs: 1. Farzam Farbiz (I ² R)
11.	A Scalable Multimedia Platform for Home Surveillance and Entertainment	Tham Jo Yew (I ² R)	Co-PI: 1. Li Xiaorong (IHPC) 2. Goh Kwong Huang (I ² R)

Legend:

DSI = Data Storage Institute

I²R = Institute for Infocomm Research

IHPC = Institute of High Performance Computing

IME = Institute of Microelectronics

IMCB – Institute of Molecular and Cell Biology

IMRE = Institute of Materials Research and Engineering

NTU = Nanyang Technological University

NUS = National University of Singapore

SIMTech = Singapore Institute of Manufacturing Technology