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Media Release

Students Lauded for Creating Smart Solutions to Transform Quality of Life

Minister for Finance Mr. Heng Swee Keat presented awards to winners of Energy Innovation Challenge and IES Innovation Challenge for the Community; and witnessed the launch of the ‘I am a Young Engineer’ Badge

The National Engineers Day (NED) 2018 today celebrated the best of youthful creativity and passion in making a difference to the society through engineering. Mr. Heng Swee Keat, Minister for Finance presented the Energy Innovation Challenge (EIC) 2018 and the IES Innovation Challenge for the Community 2018 awards to winning students at the NED 2018 Prize Presentation Ceremony as the event guest-of-honour. He also witnessed the launched of the “I am a Young Engineer” Badge.

EIC 2018 Winners

EIC 2018 challenges students to design smart engineering solutions for health, living, mobility and services. This year’s EIC saw 120 teams participating across four categories, compared to only 73 teams in its inaugural year in 2015. This includes 18 overseas teams from Bangladesh, Hong Kong, Indonesia, Malaysia, Pakistan and the Philippines for Category 4 (Local and Overseas Universities).

After a networking party in March 2018, participating students from Category 1 to 3 went through a series of workshops and camps that equipped them with design, finance, marketing, logistics management and technical skills to build their solutions. They also had the unique opportunity to be personally guided by professional engineers as mentors over a four-month learning journey.

The judges had shortlisted 80 teams of more than 252 students for the final rounds of judging, whereby participants had to display their projects at NED 2018 from 26 to 28 July, 2018. The four champion teams who eventually emerged are:

Category 1 (Secondary Schools): Team (S-24) – River Valley High School – An Eco-Friendly Barbecue Pit System

Category 2 (Junior Colleges): Team (J-10) – Dunman High School – Micro Energy Harvesting (μ -EH) and Its Application in Water Desalination under Emergency and Stressed Situation

Category 3 (Polytechnics and Institution of Technical Education): Team (I-06) – ITE College West – Robotic Helper FETCH

Category 4 (Local and Overseas Universities): Team (U-01) – Bangladesh University of Engineering & Technology – Cheap Braille Interface for Ebook Reading

In recognition of their outstanding performance, the top prize winning teams from Categories 1 to 3 will earn an overseas educational trip to be hosted by BMW Group in Germany, while the second, third and merit prize winners will be awarded with \$1,000, \$700 and \$300 respectively. The champions of Category 4 will walk away with an \$8,000 cash prize while the second, third and merit prize winners will be awarded \$5,000, \$3,000 and \$1,000 respectively. This year's popularity prize for all four categories constitutes \$300 each.

Jointly organised by IES and Science Centre Singapore, EIC is a nation-wide competition that gives students the opportunity to create solutions that address global energy issues. It is supported by the Ministry of Education (MOE) and the National Research Foundation (NRF) Singapore.

IES Innovation Challenge for the Community 2018

Tertiary students also received awards for applying their engineering knowledge and creativity to design practical, user-friendly solutions to enhance the quality of life of the elderly, the handicapped, the injured and the community-at-large. Participating teams from Category A have to cap their expenditure at \$2,000 and demonstrate competence in the optimal use of materials and equipment.

This year's challenge received a total of 35 project submissions across two categories. After a rigorous round of judging by a panel of academia and industry experts, 14 projects were shortlisted for presentations.

The 2018 Gold Award for polytechnics goes to Chua Chryston and Neo Yizhe from Singapore Polytechnic for building a "dementia patient tracking" using Sigfox, a LPWAN (Low Power Wide Area Network) technology. The tracker periodically transmits its GPS location to a Cloud database and enables the patient's care-taker to view the location on a Google map via a mobile app. The students hope that the invention can help dementia patients to move about without the fear of getting lost.

In the university category, the Gold Award winner is Subramanian Gowtham from Singapore University of Technology and Design (SUTD) for designing a portable image-based cytometer for rapid malaria detection and quantification. His invention detects and numerically counts Plasmodium falciparum infected red blood cells (iRBCs) from Giemsa-stained smears derived from infected blood. Subramanian's aim is to provide a cost-effective, rapid and accurate alternative for antimalarial testing without compromising on efficiency.

Launch of "I am a Young Engineer" Badge

IES also launched the "I am a Young Engineer" Badge for primary three to six students at the event, with Minister Heng as witness. This new initiative is a collaborative effort by IES and Science Centre Singapore to encourage students to discover the fun of engineering and instill interest in engineering from a young age.

The badge will provide students with introductory engineering skills and knowledge through self-directed engineering-related tasks listed on the activity card. Students can submit their completed works to their teachers or parents for verification to earn stars that will qualify them for the badge.

The badge is one of the outcomes from the Memorandum of Understanding (MoU) that IES signed with Science Centre Singapore in 2016 to stimulate interest amongst students in engineering and is sponsored by HDB, PUB, Micron and ST Engineering.

NED 2018

The Prize Presentation Ceremony also marked the conclusion of the ninth annual NED, the largest engineering youth carnival in Singapore, organised by IES to celebrate the

achievements of engineers, inspire young engineers and intrigue the young generation in engineering.

Besides EIC 2018, the three-day NED 2018 presented a concentration of talks and workshops to help students discover the wonders of engineering and rapidly growing career opportunities for those with an engineering education and an aptitude to discover, imagine and create.

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Notes to media:

i. Annexes

1. Annex 1 – Energy Innovation Challenge 2018 Winners & Project Descriptions
2. Annex 2 – IES Innovation Challenge for the Community 2018 Winners & Project Descriptions

ii. Chinese Glossary

<i>English Terms</i>	<i>Chinese Terms</i>
The Institution of Engineers, Singapore (IES)	新加坡工程师学会
National Engineers Day	全国工程师日
Energy Innovation Challenge	能源创新挑战
IES Innovation Challenge for the Community	新加坡工程师学会社区创新挑战
“I am a Young Engineer” Badge	我是小小工程师徽章

About The Institution of Engineers, Singapore (IES)

The Institution of Engineers, Singapore (IES) was formally established in July 1966 as the national society of engineers in Singapore. IES is the premier engineering institution in Singapore and is called upon by the Government to provide feedback on professional engineering matters.

IES is well represented among the faculty members of the major engineering institutions of higher learning in Singapore. Through close collaboration with the local universities

and polytechnics, IES organises courses, seminars and talks for engineers and IES members to advance the continuous development of engineers.

The Institution maintains close links with professional organisations of engineers regionally and throughout the world. These include organisations in Australia, China, Japan, United Kingdom and the United States. The Institution also represents Singapore in the ASEAN Federation of Engineering Organizations (AFEO) and the Federation of Engineering Institutions of Asia and the Pacific (FEIAP) in promoting goodwill and fellowship among all engineers in ASEAN and the Asia-Pacific region.

Through its Engineering Accreditation Board (EAB), IES obtained full signatory status in the Washington Accord (WA) in June 2006. The entry grants IES the authority to represent Singapore, the first country within the ASEAN region which has obtained full signatory status in the WA, to vet education systems under the WA mutual recognition framework.

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Annex 1 – Energy Innovation Challenge 2018 Winners & Project Descriptions

Category 1 – Secondary Schools

- Champion: River Valley High School
An Eco-Friendly Barbecue Pit System
To reduce the UHI effect in Singapore and encourage property developers in Singapore to contribute towards greater environmental sustainability by using renewable sources of energy
- First Runner-Up: Geylang Methodist School
A Personalized Breathing Zone (PBZ) Ventilation System Design for Epidemic Control in Public Transportation based on Computational Fluid Dynamics (CFD) Analysis
Applying Computational Fluid Dynamics (CFD) in simulation to study the impact of ventilation designs on the airflow inside a bus and impact on the spread of germs if a passenger coughs/sneezes in a bus
- Second Runner-up: National Junior College
Harvesting The Kinetic Energy of Rain and Wind with a cost effective, efficient and green set up
Environmentally greener, lightweight, space-efficient and portable prototype designed to harvest the kinetic energy of the rain and wind, both of which are undiscovered potential energy sources in tropical countries near the equator

Category 2 – Junior Colleges

- Champion: Dunman High School
Micro Energy Harvesting (μ -EH) and Its Application in Water Desalination under Emergency and Stressed Situation
A prototype of a portable water desalination device powered by such μ -Energy harvesting device which aims to provided release of drinkable water in stressed scenarios such as survival in open sea
- First Runner-up: River Valley High School

Self-Ordering & Payment Kiosk at Food Court

Customers are able to customize their food by using the machine, for example, the level of salt, level of oil, choices among different seasonings. Their ID can be identified by the system and have their preferred choice recorded

Second Runner-up: Anglo-Chinese Junior College

Smart Bullying Detector in School

This project is about a smart bullying detector which is based on a self-created text processing program on RapidMiner. This program consists of three parts: voice to text transcription, text analytics (offensive language detection) and bullying identification. The purpose of this smart bullying detector is to identify underlying verbal offense in schools, particularly those with younger children, i.e. child care centres, kindergarten and primary schools

Category 3 – Polytechnics and Institutes of Technical Education

Champion: ITE College West

Robotic Helper FETCH

Our project is a Robotic helper that helps the elderly to fetch items for them in their house. The robot looks at the flashcard with the QR code, then proceed to move to the shelves and pick up the items that is on the flash card

First Runner-up: ITE College Central

Smart Rehabilitation Knee Brace

A smart assistive knee exerciser aims to provide safe and easy to use features for the patient after a knee replacement operation. It is capable of tracking the rehabilitation progress through accurate measurement of the knee bend angle

Second Runner-up: ITE College East

Mobility Tracker

Addressing the problems of dementia and falls, associated with the old, elderly through a modified walking stick

Category 4 – Local and Overseas Universities

- Champion: Bangladesh University of Engineering & Technology
Cheap Braille Interface for Ebook Reading
An interface which would enable those less fortunate people to read those widely available collection of eBooks out there in Braille, without having to print
- First Runner-up: The University of Newcastle
A Smart Wireless Healthcare Monitoring System
To design and build a fully integrated wireless healthcare monitoring system for two or more patients with multiple biomedical sensors to transmit real time data wirelessly
- Second Runner-up: Nanyang Technological University
The Hand Motion Controlled Robotic Arm
Through machine learning, the hand motion controlled (HMC) robotic arm would be able to mirror the precise movements of its user and repeat the motion for future cycles. Wirelessly connected to a user's hand and controlled via simple hand movements, ie, lifting the hand or moving the wrist, the HMC robotic arm can carry out complex motion paths and be applicable in instances such as handling electrical circuits, releasing the wheelchair ramp on public buses and aiding elderly mobility

Annex 2 – IES Innovation Challenge for the Community 2018 Winners & Project Descriptions

Category A (Polytechnics):

- Gold Award: Chua Chryston and Neo Yizhe from Singapore Polytechnic for “Dementia patient tracking using Sigfox”
- Silver Award: Thaddeus Tang, Rohan Krishnan, Amos Seah Hao Yi and Muhd Hirzie Amirul Bin Suahardi from Nanyang Polytechnic for “Upper limb rehabilitation station”
- Bronze Award: Brian Joseph Ng, Zane Koh, Muhammad Lufti and Hoh Ching Ru from Singapore Polytechnic for “Kneehab”

Category B (Universities):

- Gold Award: Subramanian Gowtham from Singapore University of Technology and Design (SUTD) for “A portable image-based cytometer for rapid malaria detection and quantification”
- Silver Award: Benjamin Ang Wee Keong, Lau Ye Wei and Raye Yeow Chen Hua from National University of Singapore for “Print-it-Yourself (PIY) wrist sleeve: a 3D printed soft robotic wrist mobility device for stroke patients”
- Bronze Award: Chan Jia Jun, Mark Lee Wei Bin, Tai Huay Yi from National University of Singapore for “Sole Mate: A self-sustaining tracking device for dementia patients”