TSE is going fully digital in Feb 2021! See page 09 for details.

THE MAGAZINE OF THE INSTITUTION OF ENGINEERS, SINGAPORE

THE SINGAPORE ENGINEER

January 2021 I MCI (P) 020/03/2021

THE INSTITUTION OF ENGINEERS - SINGAPORE -
www.ies.org.sg

COVER STORY:

PUB tests new portable flood barrier for use in the monsoon season

PLUS

IES UPDATE: Setting the standards in railway engineering
ENVIRONMENTAL ENGINEERING: Trials of autonomous road cleaning vehicles commence
PROJECT APPLICATION: A barrier to protect Venice from flooding

IES PRESTIGIOUS ENGINEERING ACHIEVEMENT AWARDS 2020:

RECIPIENTS AND PROJECT DESCRIPTIONS

The winning projects are in four categories - Applied Research & Development, Engineering Projects, Technology Innovation, and Young Creators.

At the conclusion of the National Engineers Day on 21 November last year, the winners of the IES Prestigious Engineering Achievement Awards 2020 were also announced, recognising the outstanding contributions of local engineers to advancing engineering and enhancing quality of life of Singaporeans.

A record number of 50 submissions were received for consideration, an indication of the expanse of engineering innovations being developed in Singapore.

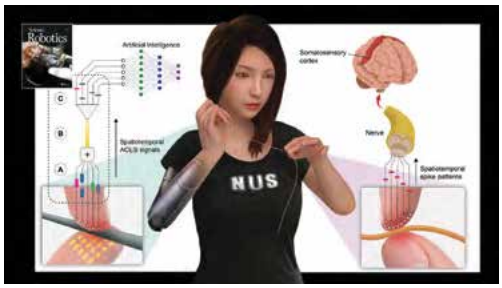
The winning projects demonstrated excellence in impacting lives, society and economy, and were judged based on the resourcefulness in the planning and solving of design problems; pioneering use of materials and methods; innovations in planning, design and construction; as well as unique aspects and aesthetic values.

All photos and images have been adapted from submissions by the project teams, which were broadcast during the NED 2020 – EIC Prize Announcement Ceremony livestream on 21 November 2020.

CATEGORY: APPLIED RESEARCH AND DEVELOPMENT

Solid State Transformer for Energy Grid 2.0 by Energy Research Institute @ NTU

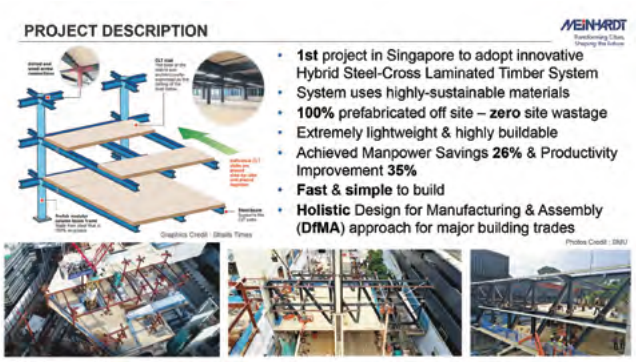
From AC-generation and AC-loads, the distribution power grid is rapidly transitioning to AC/DC distributed generation and DC-loads. This shift will create massive power imbalances at distribution networks leading to frequent disruptions. Solid State Transformers (SST) developed at NTU will seamlessly integrate loads and energy resources irrespective of these being AC or DC. These multi-functional SSTs will decouple DC-generation or loads from the main grid and prevent them from causing any power transfer or power quality issues.



Neuro-inspired Electronic Skin Nervous System for Intelligent Autonomous Robotics by NUS Engineering

Benjamin Tee and his team at NUS have developed an artificial nervous system called ACES that enables ultrafast electronic skins. The system can touch and discriminate object properties 10 times faster than the blink of a human eye and can scale to hundreds of thousands of sensors without sacrificing speed. This technology will impact lives by advancing prosthetics and robotics technology.

CATEGORY: ENGINEERING PROJECTS



Singapore Management University Connexion by Meinhardt Singapore

The fast track project optimised the principles of Design for Manufacturing and Assembly (DfMA) for Civil & Structural, Mechanical & Electrical and architectural facade work, resulting in substantial improvement in manpower productivity and enabling timely completion. The primary structural solution adopted an innovative hybrid steel-cross laminated timber floor system that advocates 100 per cent fabrication off-site, is highly buildable, sustainable and new in the local built environment. The extensive use of pre-fabrication for the M&E systems and facade further enhanced construction productivity and safety on-site.

Largest Wildlife Shepherding in Singapore Using Innovative Engineering Solutions by Samwoh Corporation

In 2016, Urban Redevelopment Authority (URA) collaborated with Samwoh to conduct land preparation work of a 300,000 m² secondary forest in the vicinity of Yio Chu Kang and Lentor Drive. Knowing that it was the natural habitat of the wildlife, the project team put in due care and consideration of the animals' safety and wellbeing.

The deployment of numerous innovative engineering solutions, meticulous planning and systematic execution of the project team contributed to the successful execution of the largest wildlife shepherding initiative in Singapore with no animals being harmed over this 11-month operation. In the process, two endangered Sunda pangolins were handed over to the Singapore Zoological Gardens and some animals were released safely to the neighbouring habitats.