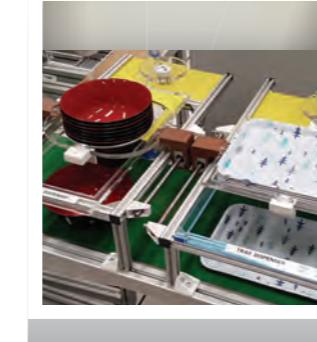
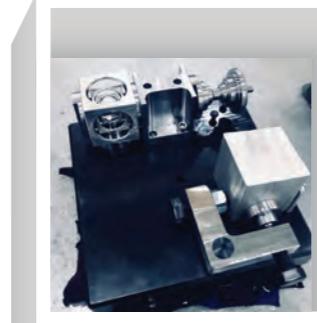
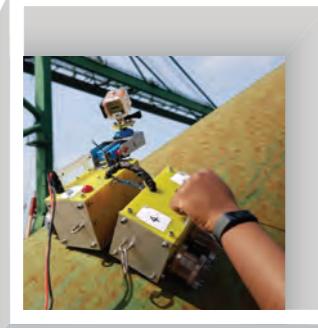
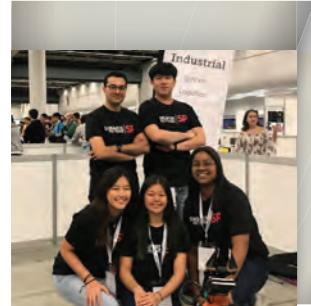
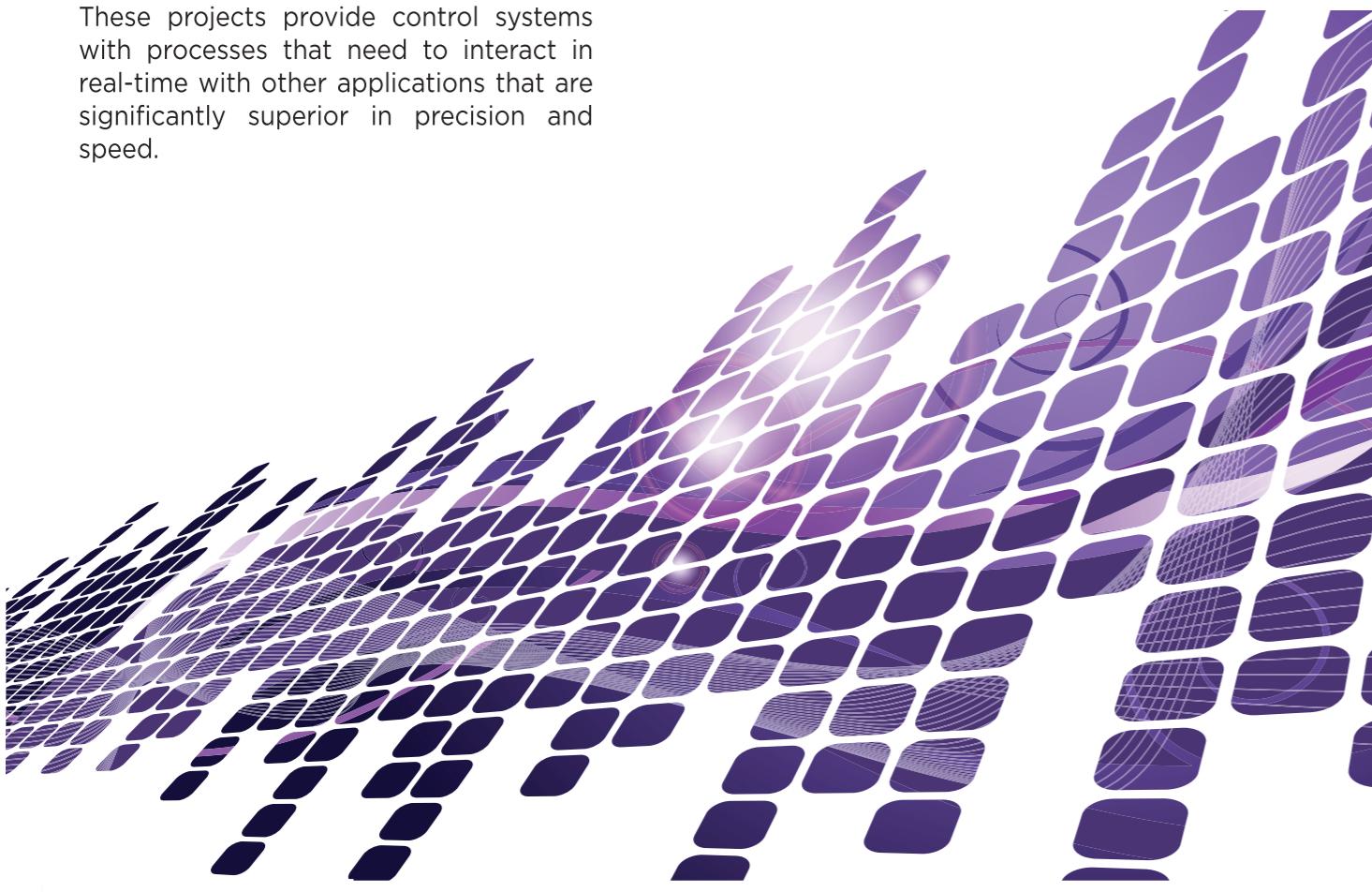




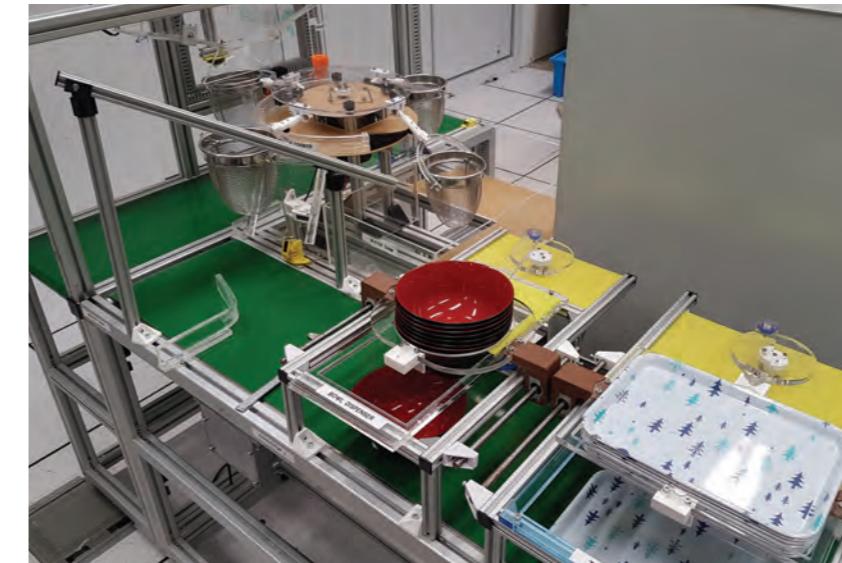
## INDUSTRIAL & AUTOMATION

These projects provide control systems with processes that need to interact in real-time with other applications that are significantly superior in precision and speed.



### A BOWL OF NOODLE 4.0

The objective of this project is to embrace industry 4.0 to improve the productivity and efficiency of the noodle-cooking process. Noodle 4.0 is an automated noodle-cooking system which uses smart ordering and smart payment technology. It uses data analytics to understand customer's preferences and provides recommendations for those who are health conscious. Noodle 4.0 offers pre-ordering services. Sorry! No cash payment! We only accept cryptocurrency. So hurry! Pre-order a bowl of noodle 4.0.

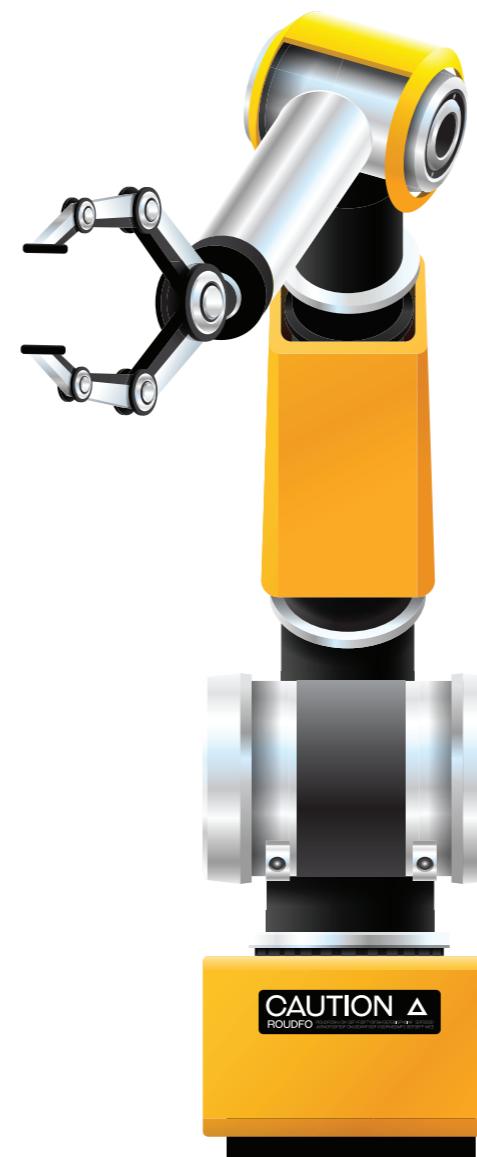


Automated noodle cooking.

**SUPERVISORS**  
Rick Chua, Lim Joo Ghee, Tony Suah

**TEAM MEMBERS**  
Lim Pin, Hariharan Pillai S/o Subbramaniam, Kabeta Motoki, Muhammad Fayzan Siddiqui, See Toh Sum Fei, Lin Junjie, Tuang Guang Zhi, Yong Zheng Yuan Kevin, Nursarah Sabrina Binti Roslan

**INDUSTRY PARTNER**  
Siemens Pte Ltd



### INTELLIBOT@WORK

On the wish list of many in the industry is a robot that can work autonomously in an industrial environment and support human co-workers by taking on complex tasks ranging from manufacturing to automation and parts handling to general logistics. The IntelliBot@Work is one response to that wish list. Equipped with advanced manipulators, the IntelliBot@Work is able to autonomously recognise objects, pick them up and place them on a tray and transport them to a designated location. It is also intelligent enough to find its way around its operation arena, avoid obstacles and deal with unexpected events.



Team SP 2019.

**SUPERVISOR**  
Asadollah Norouzi

**TEAM MEMBERS**  
Chia Nicholas, Ashley Chua Jun Hong, Man Chun Hang, Kenny Voo Tze Rung

## SMART FIXTURING SYSTEM FOR CNC MACHINE

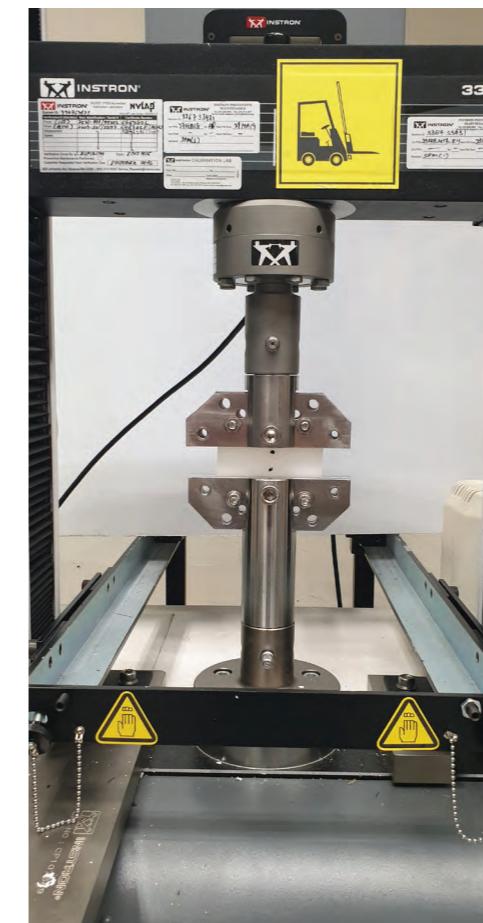
This project involves the design of a machining fixture for the cube-in-cube. This is meant to be the School of Mechanical and Aeronautical Engineering's premium souvenir in the near future. Without the fixture, the machining process, using a typical 3-axis CNC milling machine, is very demanding. The fixture cuts down the time required to machine the part and may possibly be integrated into the future Digital Fabrication Factory.



The actual fixture showing how the workpiece is loaded on the fixture for machining.

**SUPERVISOR**  
Hendra

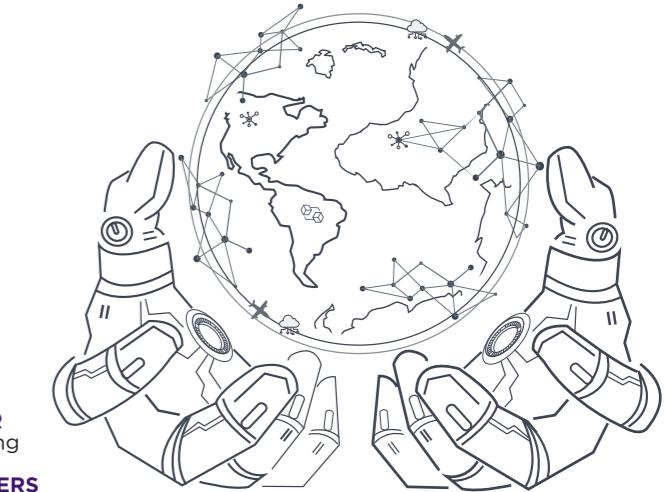
**TEAM MEMBERS**  
Yeo Zhan Jun,  
Cheong Siu Lun, Chen Zijie



Planar test fixture mounted in UTM.

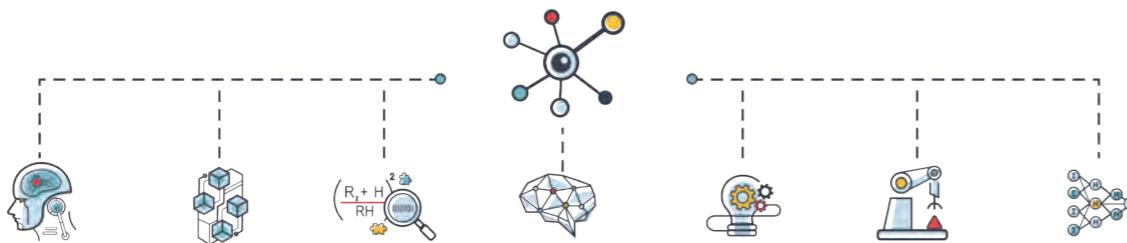
## DESIGN, FABRICATE & TEST FOR RUBBER MATERIALS

This project aims to characterize the mechanical properties of rubber under applied loads by obtaining the stress-strain curve of a rubber material through various types of mechanical tests. The mechanical properties are to be used by Sivantos Pte Ltd to help design rubbery components in their product. Two main fixtures (planar and bi-axial) are fabricated and being used to characterize the rubber materials.



**SUPERVISOR**  
Lee Kim Kheng

**TEAM MEMBERS**  
Suen Tung Shing,  
Keith Leong Jie Kai,  
Awad Ruzaini Bin Rosli,  
Sim Shi Kang



## PIPE-CLIMBING ROBOT V4

The Pipe-Climbing Robot was designed to traverse along the steel pipes via means of magnetic adhesion. The robot, with 2 separate bodies linked together, is able to fit the curvature of a pipe's varying diameter. Equipped with a camera system, the robot is able to provide a live feed transmission to a user, and has the ability to record videos and take photos of the pipe.



Robot reversing on pipe.

**SUPERVISOR**  
Thevaraja Ramu

**TEAM MEMBERS**  
Koh Jian Feng Ryan, Karishein Chandran,  
Chin Chong Yuan, Prasad S/o Tamil Selvan

## MECHANISED WASHING SYSTEM IN CENTRALISED CLEANING UNIT

High pressure washing of valves and coolers is a repetitive process. It can also be labour intensive and time consuming, not to mention physically demanding, due to the harsh working environment. The aim of this project is to fabricate a washing machine that targets the cleaning of valves and air coolers using a rig and an automated washing process. Introducing an AC motor and program to move the washing nozzles at the desired speed also ensures a more thorough cleaning.

**semcorp marine**

**Mechanized Washing System in Centralised Cleaning Unit**

**PROBLEM IDENTIFICATION**

High pressure washing on Valves & coolers is repetitive process after chemical soaking and Ultrasonic cleaning in chemical cleaning unit (CCU) respectively.

- Labour intensive & time consuming process
- Physical-demanding & harsh working environment (high decibel, pressurized & high temperature)
- Additional PPE requirement: u-vex suit, face shield & ear muff

**PICTURES & EXPLANATION**

**OUR IMPROVEMENTS**

Fabricate an washing system that adopted from the automated dish washing system (F&B industries)

**Target:** To clean valves & air cooler with an adjustable water feed rate. This project is divided into 2-stages

**Stage 1 – Construct a rig to determine effective washing rates**  
**Stage 2 – Automate the washing process by introducing a AC motor and program to move at the desired speed.**

**BENEFITS**

- Less manpower requirement
- Reduce fatigue of worker
- Improve ergonomics posture
- Ability to increase washing area
- Lesser exposure to washing zone, thus reducing hazard to the working personnel.

**PRESENTED BY: MECHANICAL DEPARTMENT**

1. Chang Seng Joo
2. Doss George Fernandez
3. Mohamed Bin Abdul Ghani
4. Mohd Firman Bin Abdul Aziz
5. Pearlyn Teo Pei Lin
6. Yoong Jun Kiat Damien

**INNOVATION THROUGH LIMITLESS IMAGINATION**  
SEMCORP MARINE ADMIRALTY YARD  
INNOVATION CARNIVAL 2018

Mechanised high pressure washing machine jointly developed by Sembcorp and SMA interns.



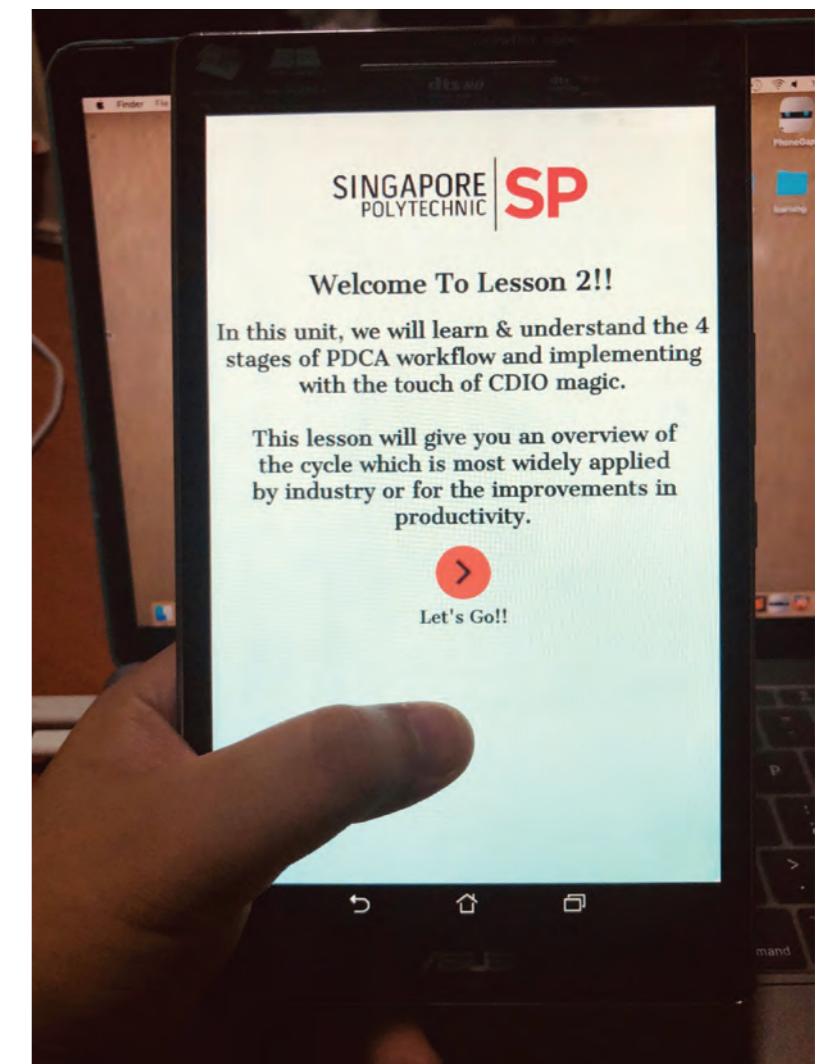
## INFOCOMM & MEDIA

These projects deal with digital technologies in the new era of infocomm-enabled applications and digital media. These projects handle interactive applications involving infocomm technologies.



## MICRO-LEARNING ON PRODUCTIVITY + U

The project introduces an innovative learning platform for users to access material to gain knowledge in the area of productivity. The use of a mobile application and a micro-learning approach enables the learning materials to be easily accessible thus allowing learning to be carried out anytime and anywhere. The learning content will also be more digestible for individual learners as the lesson materials are broken down into bite-sized segments to facilitate learning and understanding.



Introduction to the following lesson.

## IOT ENABLED MONITORING SYSTEM FOR ENVIRONMENTAL SAFETY @ SP

To improve environmental safety @ SP, EEE students have developed two systems using IoT technology – for mosquito control and gas leakage detection:

1. An IoT Mosquito Repellent Dosing System that can be installed at common mosquito breeding areas to monitor the environmental conditions and automatically increase the frequency of dosing during rainy days and in hot weather.
2. An IoT integrated system that can be used to detect harmful and colourless Volatile Organic Compound (VOC) gas leaks from a gas or chemical storage tank. Whenever a leakage is detected, an SMS alert is sent to the concerned authority.



IoT Enabled Monitoring System.

**SUPERVISOR**  
Phyo Kyaw Kyaw

**TEAM MEMBERS**  
Brian Ngoh Jia Yi,  
Koh Hoe Woon, See Ming Yuan

**INDUSTRY PARTNER**  
W2 Industrial Services Hub Pte Ltd

## SMART TECHNOLOGIES FOR SMART CAMPUS

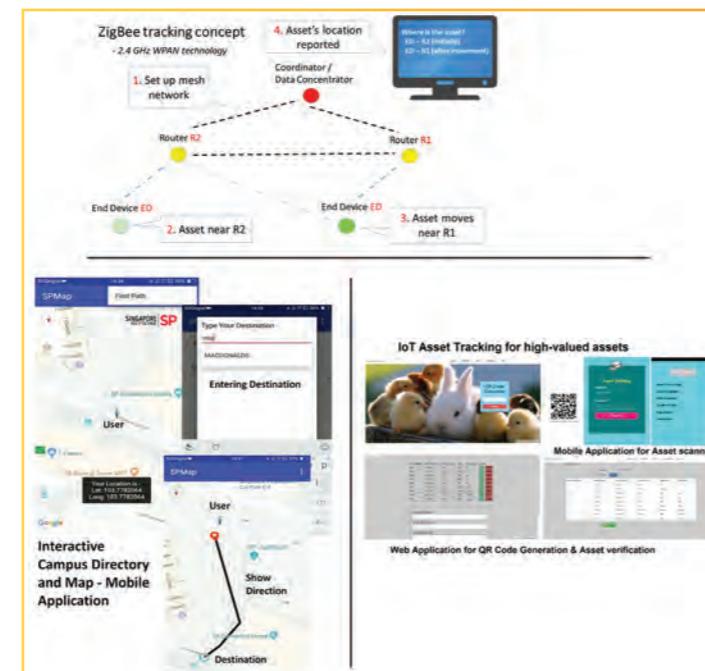
To stay relevant in customer service, business technology in SP has to remain agile and make constant changes and updates. The objective of these projects is to use smart technologies to enhance the experience of various stakeholders. These projects include: 1. An interactive campus directory and map transform navigation experience for SP visitors; 2. IoT system for tracking SP assets to help improve productivity and accuracy in tracking of important assets.

### SUPERVISORS

Chong Siew Ping, Melvyn U Myint Oo, Wong Chee Yong

### TEAM MEMBERS

Muhammad Irfan Bin Abdul Rahman, Yeo Wei Tao, Pang Chai Yaw, Ho Zheng Wei, Mok Cheuk Lun, Yong Shu Ting, Low Wai Chong, Ang Gwendolyn, Ang Yan Sheng



Smart technologies for Smart Campus.

## AUGMENTED REALITY INSTRUCTIONAL APP : TORQUE LOADING AND VIDEO PROCEDURES

The Augmented Reality (AR) app contains three main features, namely Step-by-step Guidance, Guided Animations & Video Tutorials, all displayed at an adjustable distance and angle. The AR app provides an innovative, new approach to learning by enabling self-directed learning and improving process visualisation through an all-in-one guidance system for quicker understanding and independence in learning.



### SUPERVISORS

Kelvin Ong Chin Peng, Sufyan Zainalabidin

### TEAM MEMBERS

Cheong Lei Siong, Tan Qingyong Anselm, Lim You Jie Jaden, Tay Shi Yu Francis, Ng Pin Sheng, Lee Pei Ming, Michael Fiehl Jose Palero

On-site working with augmented reality.

## VIRTUAL REALITY TRAINING: SUPPORTING AIRCRAFT SYSTEM AND STRUCTURES COURSEWORK

Students are currently using hard-copies of 2D images to learn about the different aircraft systems and structures. The aim of this project is to develop Virtual Reality Training contents that simulate the environment and components with their functional features described within the environment. The environment and components will be created using modelling software learnt. There will be an assessment content developed to ensure that trainees have grasped the content.



Virtual reality learning.

**SUPERVISOR**  
Kelvin Ong Chin Peng

### TEAM MEMBERS

Quek Wei Xiang, Michael Adelyus, Chai Ming Keat, Sim Jun Jie Willie, Lee Yuan Ian, Ng Ji Ying June, Joel Chow Shao Lun, Nur Hana Binte Abdul Karim



## DIGITAL VISUALIZATION (AR) FOR CNC MACHINING OPERATION

Augmented Reality (AR) can provide more enriching experiences and information to the user. In CNC machining, AR could minimize errors in long and memory-intensive operations. The enriched information in AR could also assist new learners in acquiring skills and knowledge faster than through traditional paper illustrations or written instructions. This project involves the creation of AR to enhance the practical lesson of a second year module, Computer-aided Machining, which requires more than 300 detailed steps to operate the machine panel and set up each cutter before actual machining takes place.



Digital Visualization (AR) for CNC machining operations: Guided instruction to locate the required tool.

**SUPERVISOR**  
David Tan Soon Ling

### TEAM MEMBERS

Muhs Khairudin Bin Selamat, Sng Sok Hng, Low Tingzhen, Shaza Dhanea Binte Rahmat