

INSTRUCTIONAL ASSEMBLY & DISASSEMBLY OF AN A/C COMPRESSOR USING AUGMENTED REALITY

Augmented Reality (AR) can aid a user in the acquisition and retention of information. In the automotive industry, AR could minimize errors in long and memory-intensive operations. This project aims to assist the process of assembling and dismantling various parts of an automobile by incorporating the use of augmented reality (AR) with PTC software. The augmented models offer step-by-step instruction to help ease the workload of the user and enhance the user safety throughout the assembly and disassembly process of an Air-Conditioner Compressor.



Main page of the instructional augmented reality app showing the overall compressor assembly.

SUPERVISOR
Sufyan Zainalabidin

TEAM MEMBERS
Diana, Ngiam Zhen Ying,
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Muhamad Irfan Bin Zaid

ROBOTIC PROCESS AUTOMATION (RPA) FOR CYBERSECURITY (WEB-BASED ATTACKS)

This project aims to use an open source Robotic Process Automation (RPA) tool to check a list of websites periodically for signs of attack and maintain a database of common web attacks by using information available from OWASP and other similar sites. Limitations and vulnerabilities found in TagUI will also be documented as part of the analysis.

A detailed poster for a project titled "DeVictas". The top section features the project logo (a stylized 'D' with a slash) and the title. Below it, sections include "Introduction", "Objectives", "Tech Used", and "Supported OS". The "Introduction" section discusses the need for an automated detection tool for web defacement. The "Objectives" section lists "Detect Defacement", "Single vulnerability database", and "Alert administrator". The "Tech Used" section includes Python3, TagUI, Docker, and MySQL. The "Supported OS" section lists Debian 9. The middle section, "FEATURES AND FUNCTIONALITIES", lists "Containerised Extraction", "Automated Detection", "A.I. Assisted", "Realtime Monitoring", and "Role-based Access Control". The "DETECTION PROCESS" section shows a flowchart with steps: "Generate Baseline", "Analyze Current State", "Retrieves Current State", and "Alert Admin". The "ACKNOWLEDGEMENTS" section thanks Mr Ken Soh and Dr Peter Leong. The "CONCLUSION" section states that administrators are alerted quickly once a defacement is detected. Logos for AI Singapore, Infocomm Security Management, and SP School of Digital Media & Infocomm Technology are at the bottom.

Poster.

BYTESG

The aim of this project is to uberize the purchasing of food on campuses through the use of technology. This system not only allows a user to purchase food conveniently but also allows another user to earn additional income by delivering the food. This creates an ecosystem within campuses such as SP's and creates opportunities for some users to earn extra cash even as others avoid peak hour queues.



SUPERVISOR
Tan Boon Yuen

TEAM MEMBERS
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Lau Ze Zhun Aaron,
Ee Xinhui Anita,
Yeo Boon Hao,
Tan Ya Pei Charmaine

Poster.

BLOCKCHAIN-BASED IP TRACEBACK (BITE)

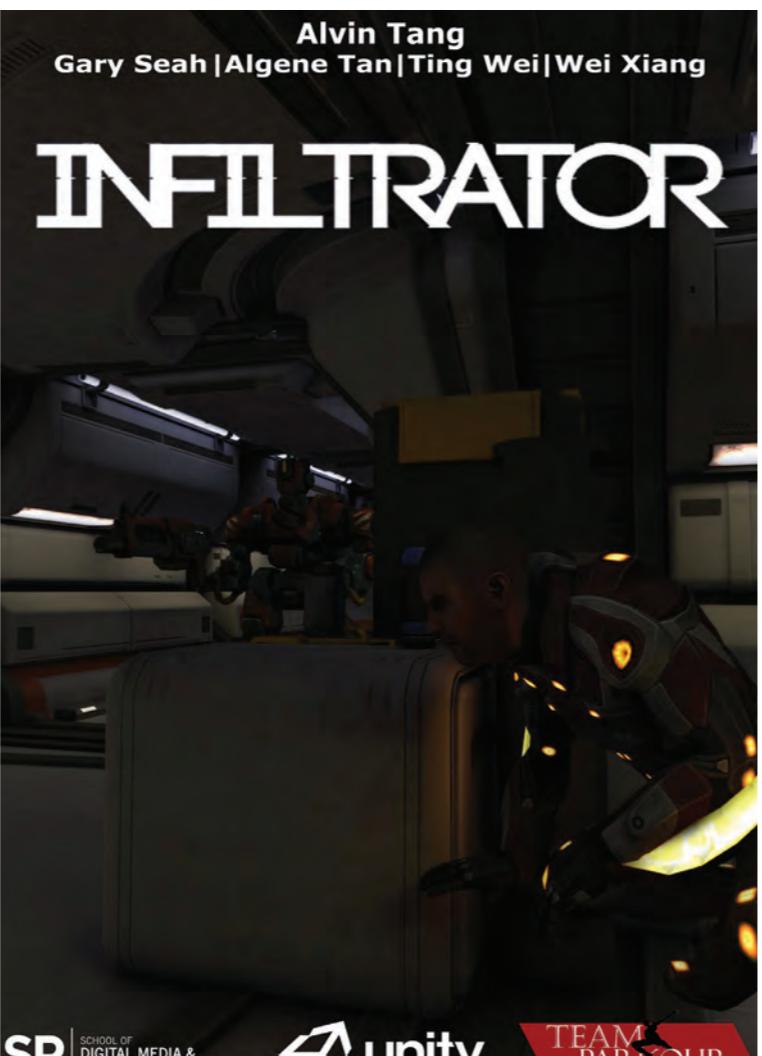
The Final Year Project Blockchain based IP Traceback (BITE) utilizes blockchain technology, together with traditional packet marking solutions to determine the origins of Internet Protocol (IP) packets accurately, while at the same time, ensuring the integrity and authenticity of the recorded information. This Internet packet-tracing solution can then be used to trace the origin of a cyber-attack so as to identify adversaries with greater confidence.

A detailed poster for the BITE project. The top section features the project name and "DIPLOMA IN INFOCOMM SECURITY MANAGEMENT FINAL YEAR PROJECT". The "INTRODUCTION" section discusses the increasing ease of performing cyber attacks like DDoS and DoS. The "TECHNOLOGY" section details the use of Tendermint, Django, and Graphical Network Simulator 3. The "LANGUAGES" section lists Python, C++, Java, JavaScript, and GoLang. The "PROPERTIES" section covers trace packet flooding attacks, path validation, and secured authentication. The "SHOWCASE" section shows screenshots of the Django Web Interface and Block Explorer. The "TEAM" section lists members Loh Kai Mun, Pang Song Chen, Huang Jia Yi, Neo Jia Errn, Neo Jia Tian, Dr Su Le, Mr Fok Kar Wei, Internal, and Miss Junie Tan. Logos for Infocomm Security Management and SP School of Digital Media & Infocomm Technology are at the bottom.

Poster.

INFILTRATOR

Infiltrator is a multiplayer stealth action game where users use their surroundings and their parkour abilities to traverse the world and complete objectives in order to stop robots that have taken over the world. The game is developed by Diploma in Information Technology (Game Development Specialization) students from Singapore Polytechnic.



Poster.

KIDZANIA'S QUEUE MANAGEMENT SYSTEM: Q-ZEE

KidZania faces problems with long queues at popular stations. Hence, we developed Q-zee, the queue application to make queuing easy.

Features

- Simple & Efficient
- Effective Time Planning
- Improve Staff Management
- Real-time Analytics

Quickly get into queue using KidZania's RFID technology

Have fun trying out other activities while waiting for your turn

Improve staff productivity through efficient deployment

Make informed business decisions through our real-time dashboard

Our System

powered by

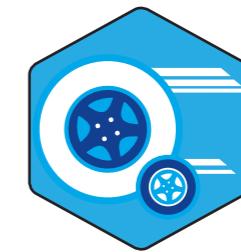
Developed by Syong Yue (Leader), Beining, Jing Jie, Chermaine, Jiayu & Supervised by Dora Chua

KidZania Singapore **SP** SCHOOL OF DIGITAL MEDIA & INFOCOMM TECHNOLOGY

Poster.

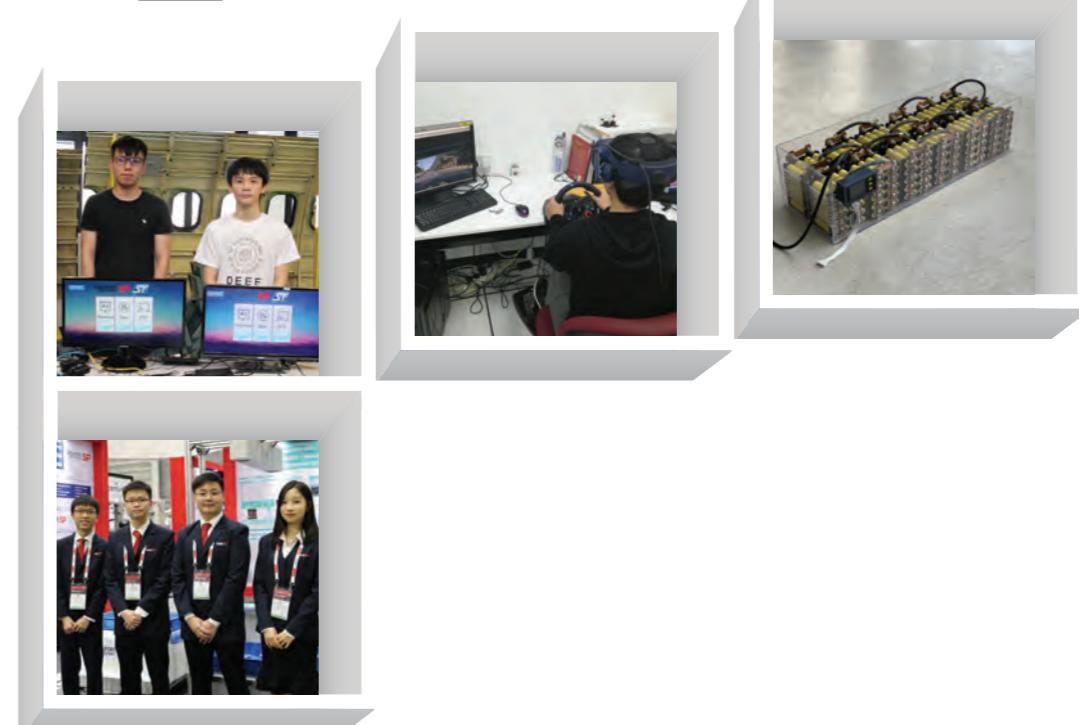
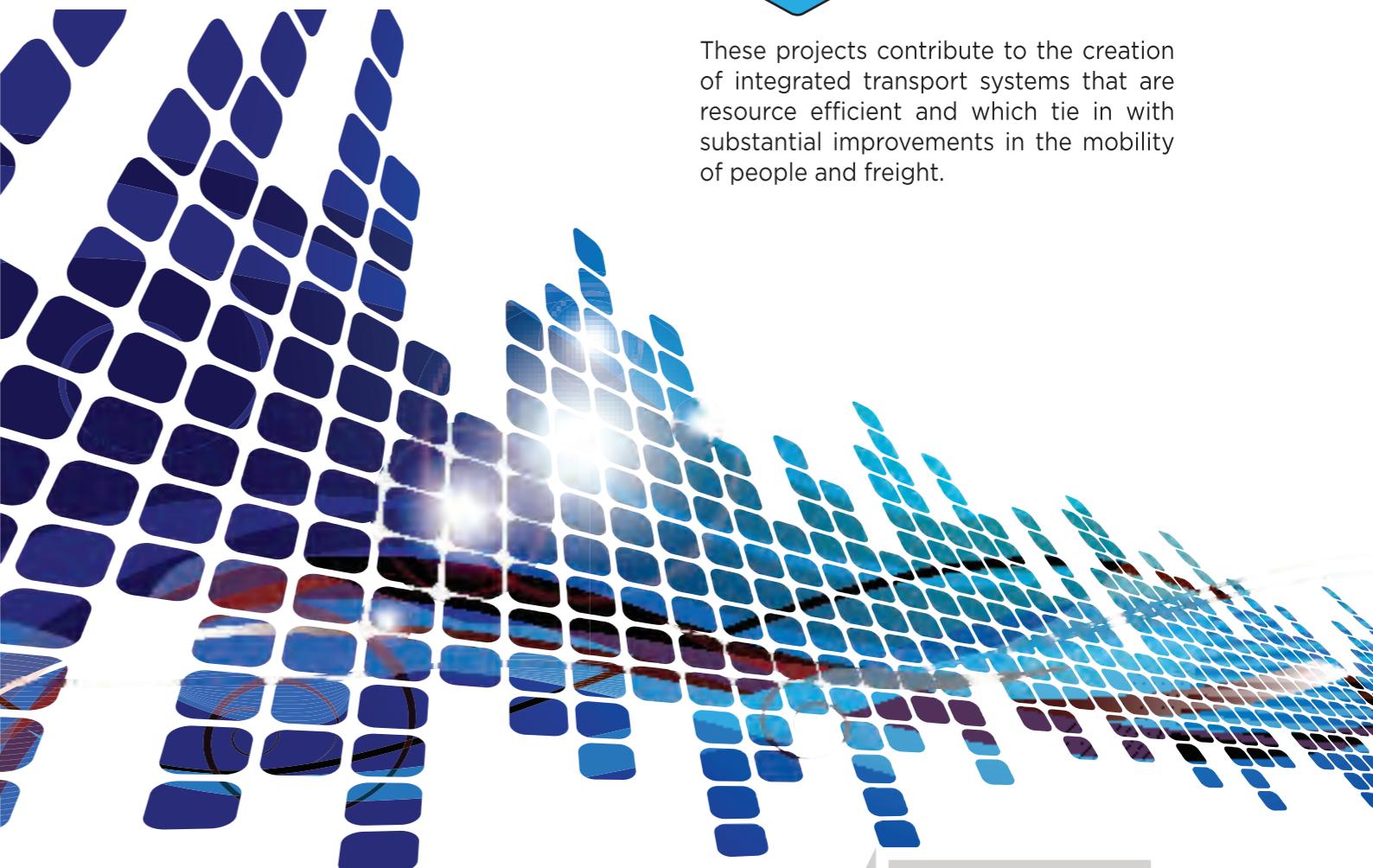
SUPERVISOR
Dora Chua Heok Hoon

TEAM MEMBERS
Fan Syong Yue, Li Beining, Jasmine Lim Hui Shan, Meng Jiayu, Tan Ying Xuan Chermaine



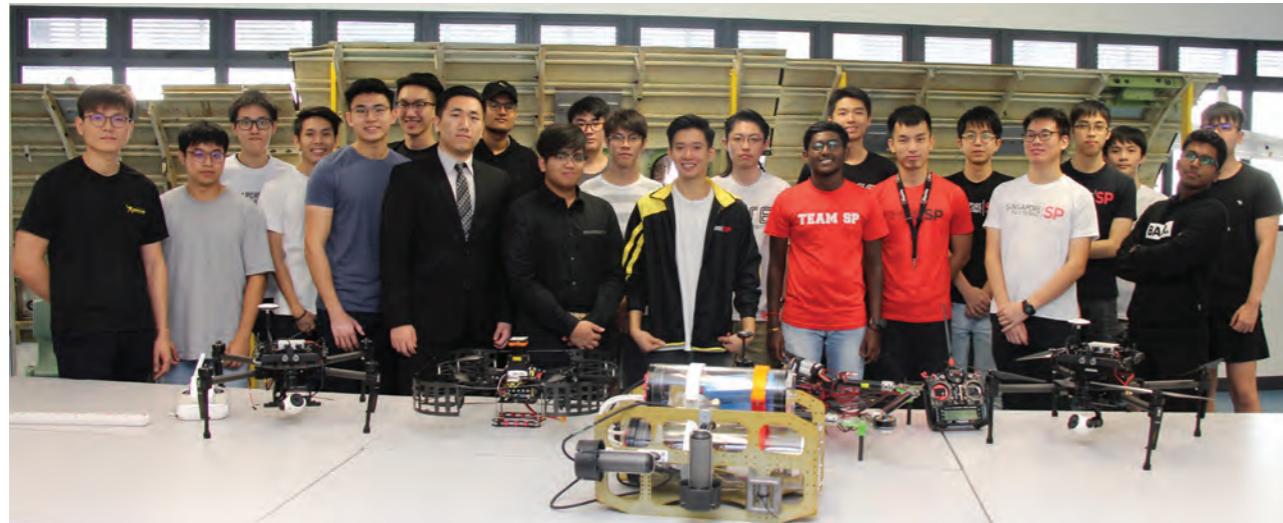
TRANSPORT & MOBILITY

These projects contribute to the creation of integrated transport systems that are resource efficient and which tie in with substantial improvements in the mobility of people and freight.



SP SECURE

The SP Secure drone system takes campus security and surveillance to new heights. The objective of this project is to develop a fully autonomous drone surveillance system where drones patrol the campus day and night, rain or shine, and autonomously respond to alarms/threats. They can also transmit live videos, communicate and collaborate with other security drones on their own. The system is a SMART Campus initiative that makes the grounds safer for students and staff. In future, with 5G connectivity, high bandwidth data like high definition video can be streamed for real-time surveillance and decision making.



The Smart and Secure Team with their equipment.

SUPERVISORS

Tan Hwee Siang, Danny Lee, M Fikret Ercan, Arun Kumar, Tan Chee Seng

TEAM MEMBERS

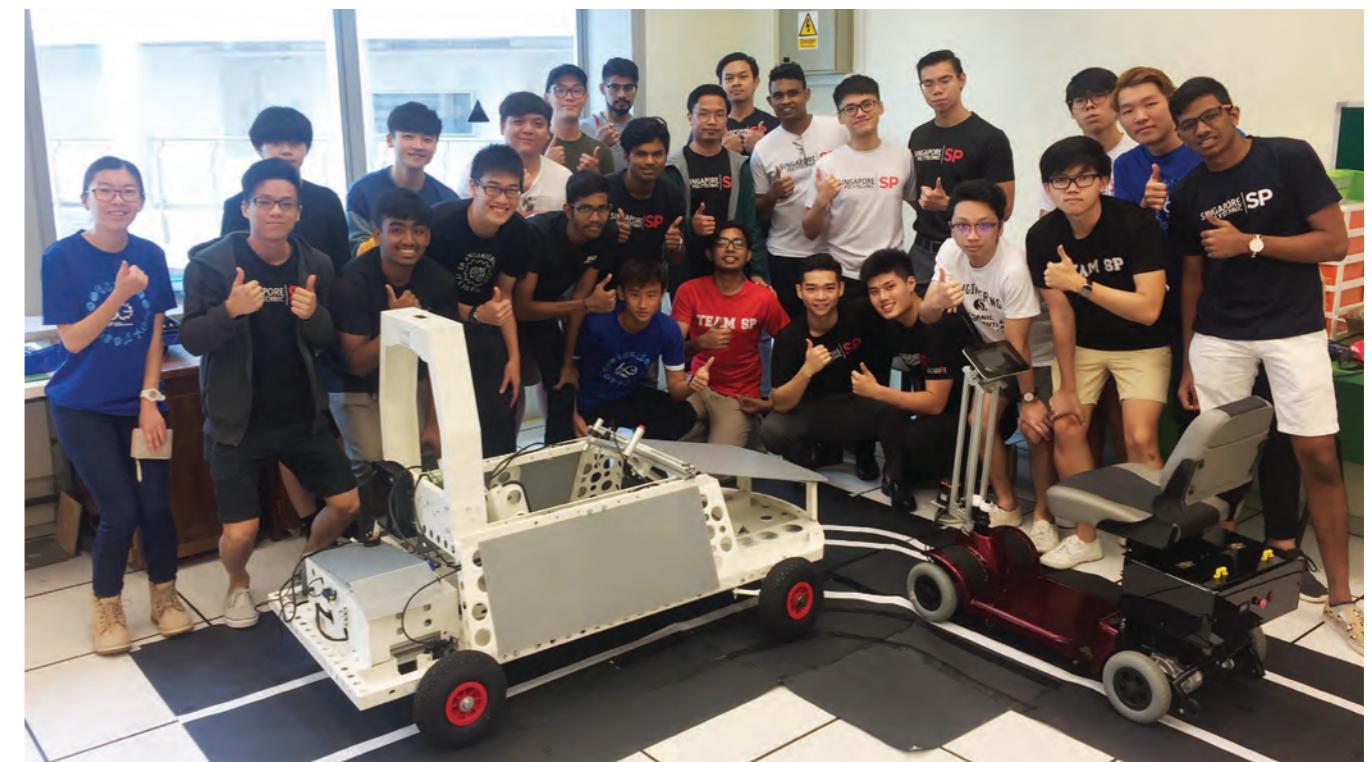
Faruq Khan Bin Hayat Khan, Jordan Heng Wei Xuan, Lim Eun Gyu, Lim Zhi Feng, Wong Wei Jien Sean, Chung Zhuo Han, Quah You Heng, Lee Jun Hao, Jerome Tay, Brandon Tan Min Ren, Ryan Ho Jun Jie, Mark Ng Jinn Rong, Jason Wang Runze, Le Hong Phuc, Syed Sumairul Hasan, Gunasekaran Gautham Kumar, Tan Jianding David, Wai Yu Xuan Jerriel, Tan Xuan Ming, Ahmad Syazani Bin Sudyanto, Bransome Tan Yi Hao, Arjun Vijay, Sadesh S/o Mogan, Leong Daniel, Naing Htun Lin Aung, Lim Yuan Sheng, Chua Wen Han, Chiam Yao Ji, Kwek Jun Wen, Eric Lim Jun Hao, Choo Tzehao Joseph

INDUSTRY PARTNERS

4KOpen, STMicroelectronics

SP DRIVERLESS AND ELECTRIFYING CAR (SPDEC)

There is little doubt that driverless cars will be the norm in future. However, it is already a reality now in SP! A group of EEE students has developed a smart electric car, SPDEC, which can move about within SP campus without any human intervention. SPDEC is hailed via a smartphone and all rides are paid using cryptocurrency. Moving forward, the technological boundary will be pushed further when 5G connectivity is deployed. The low latency provided by 5G will allow real-time video to be streamed to the cloud for data analytics and decision making.



SPDEC team and our cars.

SUPERVISORS

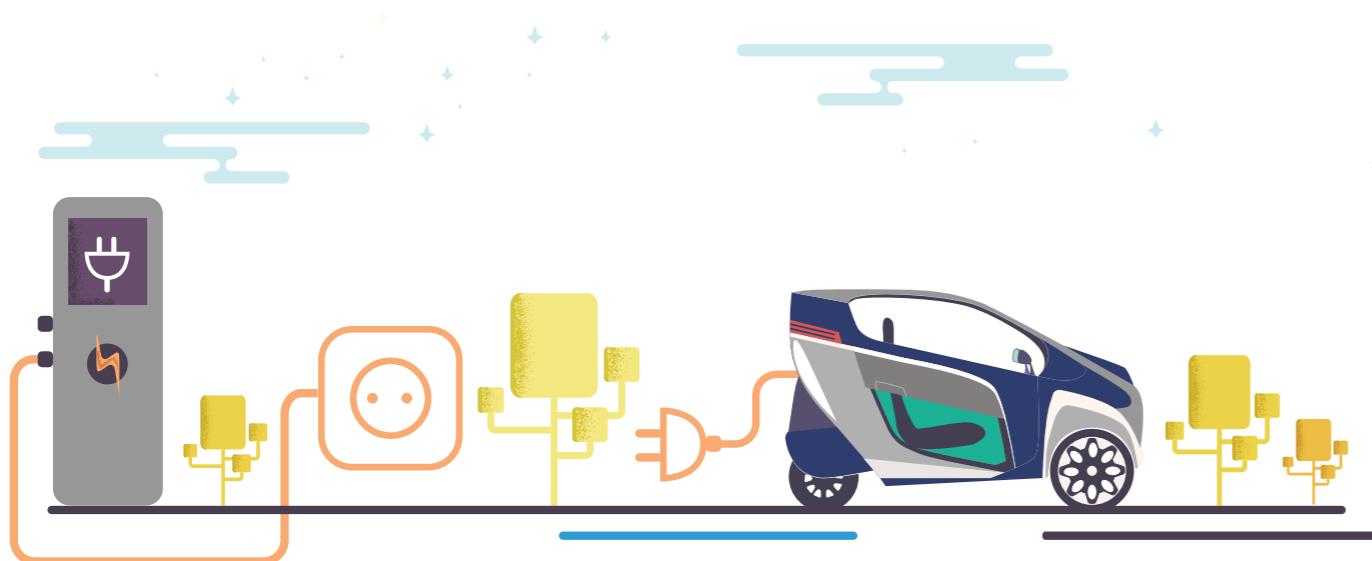
Carlos Acosta, Low Lee Ngo, Wong Kwee Yin, Phyoe Kyaw Kyaw, Sing Mong Nguang, Tan Hai Su, Lim Joo Ghee

TEAM MEMBERS

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INDUSTRY PARTNER

ST Engineering Land Systems Ltd



INTEGRATING DRONE AND VR TECHNOLOGY IN LAND SURVEYING

The objective of this project is to integrate drones into the surveying task to improve the efficiency of collecting accurate survey data in a much shorter timeframe. An autonomous drone will be dispatched to perform topographic surveys of a rail corridor. A 3D model is built using the real survey data, which will then be integrated with VR technology to provide users with a tour experience of the rail corridor, allowing them to witness the beauty of the place without physically being on site.



The team with a 3D model of the old Bukit Timah Railway Station.

SUPERVISORS
Tan Hwee Siang, Allen Liu

TEAM MEMBERS
Vincent Fernandez,
Lee Ming Yang, Tan Yi Yang Eugene

INDUSTRY PARTNERS
Bentley Systems,
Urban Redevelopment Authority



Automated Transporter.

AUTOMATED TRANSPORTER 1819S1

This project see the design and development of an autonomous transporter that can transport a person with a payload in an indoor space. It meets a growing need for personal transportation in public places such as via electric powered scooters or hoverboards. It also meets the demand for personal transportation in indoor facilities where a vehicle can navigate and move to a specified destination. Path planning and collision avoidance ensures that the vehicle travels safely to a destination in a specified time frame.

INNOVATIVE AGV WITH INDUSTRY 4.0 TECHNOLOGIES

Automated Guided Vehicles (AGVs) offer a means of transport that facilitates the movement of goods, parts and products in factories. A group of EEE students worked closely with various industry partners to develop an AGV, with Industry 4.0 in mind, which is capable of integrating seamlessly into IoT systems. It allows for wireless power charging which enables the AGV to operate continuously without the risk of down time due to dead batteries.



AGV, Cobot and sensors.

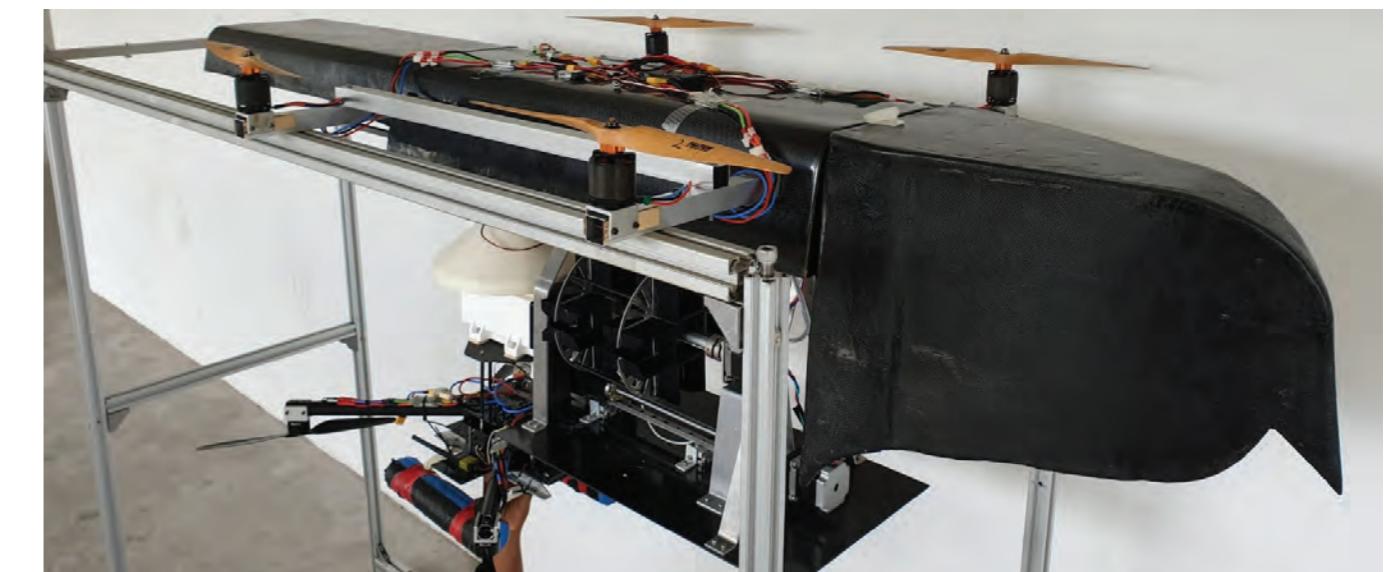
SUPERVISOR
Carlos Acosta

TEAM MEMBERS
Mok Jia Luo, Shi Yushan Eudora,
Jackie Soh Jieqi, Tin Shuen Wern Sean

INDUSTRY PARTNER
SEW-EURODRIVE PTE. LTD.

SURVEILLANCE AIRSHIP WITH CHASER DRONE PHASE 3

This is an industrial collaboration project with TwinRock that aims to create a surveillance airship capable of launching and recovering drones. It also explores the possibility of carrying out a fully-autonomous mid-air drone-to-drone battery swapping system. This self-sustaining ecosystem consists of an Airship, a Drone, and a Battery-Swapping System (BSS), all working together to achieve seamless automation. The Airship contains the BSS and acts as a Mothership to which the drone would return to for battery swapping. This entire process would take place mid-air, making this autonomous system a first of its kind.



Depiction of a drone undergoing aerial battery swapping. Pictured are the Surveillance Airship, Battery-Swapping System and drone.

SUPERVISORS
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Muhammad Nazhan Bin Sulaimi, R Devadarrshan,
Muhammad Nabil Hakeem Bin Kamsani, Lilibeth Soh Ying Xian

INDUSTRY PARTNER
TwinRock Pte Ltd

DATUM WITH HYBRID ENGINE AND GROUND CONTROL STATION (GCS)

The Detachable Aviation Transporter Unmanned/Manned Multirotor Vehicle (DATUM) is a versatile modular aerial vehicle capable of customization with a payload capability of up to 90kg. It runs on a Hybrid Engine Fuel Management (HEFM) system that enables it to have a flight time of at least 30 mins. One of the main objectives of this project is to enable the vehicle to take part in the Boeing GoFly Competition. Hence it must conform to all of the competition requirements. To support and enhance fly-ability a Ground Control Station (GCS) was also built.

SUPERVISORS

Chua Ming Sing,
Reagan Chionh,
Phang Lung Wei

TEAM MEMBERS

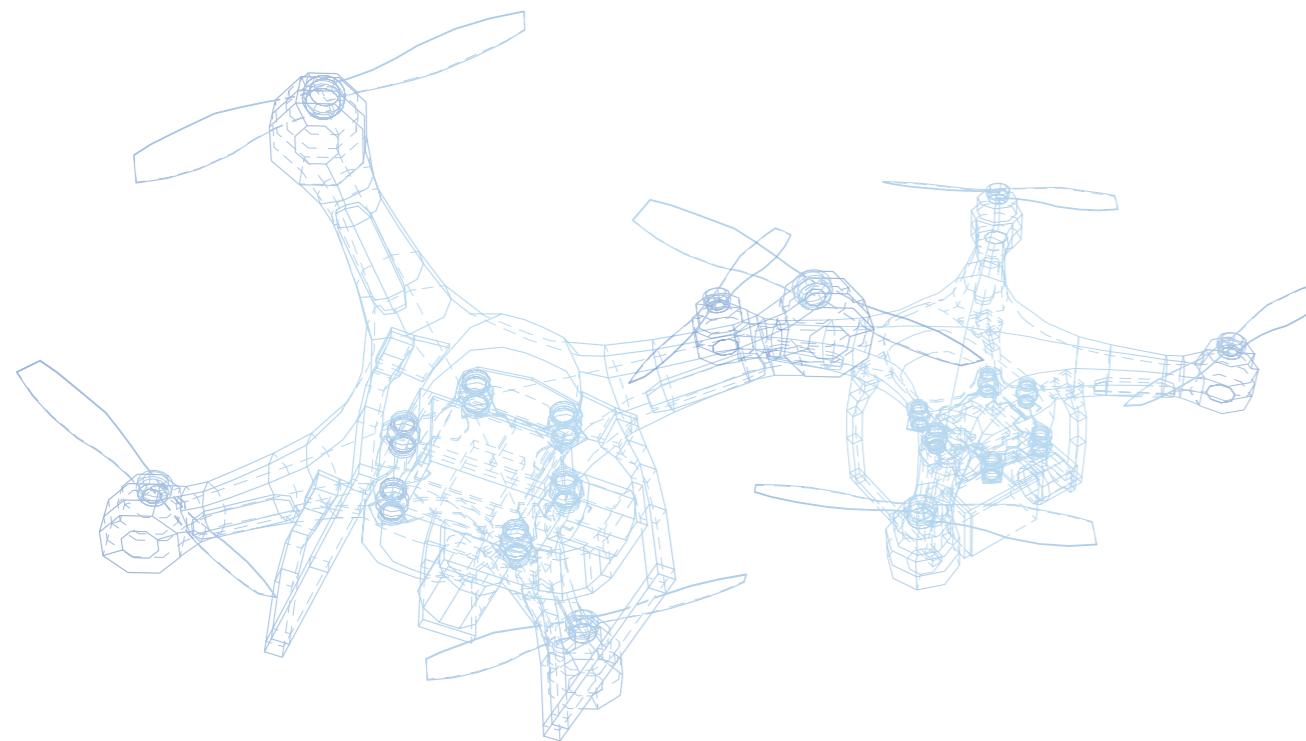
Kenneth Law Qi Long,
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Mohamed Irfan,
Schooling Ryan Hilary,
Aw Lai Seng,
Koh Siang Yung Jordan,
Goh Qian Zheng Ignatius,
Phoon Jing Zhi Nicholas,
Tan Wei Zhe,
Mohamed Illyashah Bin Kamarudin,
Lee Yi Heng

INDUSTRY PARTNER

Flare Dynamics



DATUM With hybrid engine.



SP TECH TO MARKET

The Research and Technology Development at SP is application-driven, aligning itself closely with industry needs and the broader national agenda. These projects showcase our efforts in developing technology that is industry-relevant, with strong potential for market impact.

