POWER X
ROBOTICS

PARTNER COMPANIES ONBOARD RUN 2

1.

AUGMENTUS
ROBOTICS SIMPLIFIED

Augmentus is an AI-Robotics company that offers the first no-code and fully integrated robot programming platform, enabling non-technical users to program industrial robots in minutes instead of months. This is done through an intuitive graphical interface on an iPad that eliminates the need for coding and CAD files in robot teaching. Their clients include some of the world's leading robot manufacturers and automation providers where they empower manufacturers to recoup ROI faster by lowering the time, cost, and skill barriers in industrial automation.

Project: Fully-Integrated and Offline Robot Simulator for AI-Robot Programming
Advanced AI and Robotics feature sets are currently being developed and incorporated into Augmentus' platform to streamline the development and operational processes in robotic systems. As a Trainee, you will be involved in building core functionalities, algorithms, and features to deploy the company's no-code robot programming software to industrial companies together with a team of Robotics experts. You will also have the chance to work on no-code robot path pattern projections for instantaneous industrial robot teaching.

2.

BEEX

BeeX provides new ways of conducting underwater operations with their Autonomous Marine Vehicles, designed and manufactured here in Singapore. You will be working with a multi-disciplinary team of engineers, helping their customers #BreakFree of traditional limitations with autonomy.

Project: Electrical Design for Autonomous Marine System
The electrical team will be working on the Autonomous Marine System (AMS). It will integrate their flagship A.IKANBILIS Hovering Autonomous Underwater Vehicle (HAUV) onto a catamaran Unmanned Surface Vessel, set to be launched by 2022. As a Trainee, you will be working with various sensors (radar, lidar, cameras), communication systems, and actuators (propulsion and motors). As part of your exposure, you will also be supporting sea trials for A.IKANBILIS, where you will learn how to work with an intelligent, self-thinking robot!

3.

COGNICEPT

Cognicept provides hybrid Robotics AI with their Smart+ telerobotic intervention technology and remote robot pilots. They make economical and straightforward ways to deploy robots, bridging the gap between the technology's capabilities and their customers' needs.

Their supervised autonomy tools and services make unpredictable applications reliable and expand the potential of the robots. These tools help prototyping and testing during

Robotics development and save the time and effort of forming a new team to develop these tools internally.

Project: Internet Controlled Robotic Showcase
As a Trainee, you will work with Robotics OEM and system integrators from across the globe. You will also play an important role in projects like indoor delivery robots working in hospitality, retail, medical applications, and surveillance robots for indoor and outdoor environments.

4.

Globotix specialises in the niche industry of Robotics and high technologies for the environment sector in Singapore. From as early as 2016, they have been transforming the local Facilities Management scene with AI-enabled robots that channel the powers of computer vision, advanced monitoring, real-time optimisation, analytics software, data streaming, and so much more! From a trailblazing first mover to their current undisputed market leader status in the Facilities Management field, Globotix's innovative product offerings continue to deliver impactful real-world results in the ever-challenging marketplace that enterprises face today. They remain dedicated to doing great things in the Hi-Tech space – always driving the next wave of cutting-edge technology globally.

Project: Flexa
As a Trainee, you will work with the team to develop an entirely new form of Robotics that promises to digitise the current way the Facilities Management industry works. The project's success will enable the mass adoption and integration of robots enterprise-wide, even industry-wide, with far-reaching implications even for new business arenas.

5.

Hand Plus Robotics is a software Robotics company specialising in unstructured picking - this is characterised as:

The Products are difficult to be seen or handled due to their shape, packaging, or even variety
The location to be deployed is undesirable (e.g. messy or packed warehouses)
During the picking process - this may require dexterity depending on the product or packaging
Their core technology is a software toolbox called APP+ (AI-Powered Picking and More), which offers 3 types of robotic picking cells. Pick+ is an intelligent multi-item fast bin picking, Move+ is a mobile picker, and Pack+ is picking integrated with complementary automation. APP+ leverages AI to enable the vision, grasping, and Robotics to handle various item and picking conditions.

Hand Plus is a spin-off company from Nanyang Technological University Singapore and has won awards for its picking solutions, including the Amazon Robotics Challenge, DHL

Robotics Challenge, and IROS Mobile Manipulation Challenge. They envision a world where robots are working alongside humans wherever, whenever, and whatever material handling is required.

Project: Pick+ and Move+ MVP Development
As a Trainee, you will be building picking solutions for various customers, including those in the logistics, manufacturing, and healthcare sectors. For example, we build picking solutions that inspects and kits products. We also have mobile picking robots (an agv with robot arm on top) that collects and delivers orders. Aside from robotic solutions, you will be developing robotic modules on AI, robot vision, gripper design, grasping algorithms, motion planning algorithms, user interfaces, SLAM, and a whole lot more.

6.

MOVEL AI

Movel AI is a Deep Tech company building advanced Artificial Intelligence (AI) systems for robot navigation, providing a complete robot localisation and navigation solution based on advanced Computer Vision and sensor fusion technologies. This enables the robot to move in a complex environment. Movel AI's algorithm can remember vast amounts of visual features from the 3D environment and rely on these features to localise the Automated Guided Vehicle. The company's flagship product, Seirios, is the harmonisation of web and Robotics tech stacks; providing users with an easy-to-use interface to control their robotic mobility platforms.

Project: Autonomous Navigation for Robots
Movel AI is continuously improving its autonomous navigation software. As a Trainee, you will be part of the team developing new features such as autonomous navigation in tight spaces, object detection and tracking with an accuracy error of less than 1cm. You will also be working on integrating software and different hardware from other Robotics companies and will be trained to debug different types of Robotics issues.

7.

open robotics

Open Robotics has an amazing team of highly specialised software developers, hardware developers and technical artists. They are the global leader in the industry, providing software solutions and services worldwide – creating novel solutions to the world's most challenging robotic problems. They offer Robotics R&D, consulting, custom engineering, and application development services to industry, academia, and government to create and support open-source software and hardware for Robotics – from research and education to commercial product development.

Their local team is growing and has resident expertise and technology know-how in robot middleware, robot software development, infrastructure integrations, and robot fleet simulations. Working with their global company and community, they create and support

three open-source products: ROS, Gazebo and the locally developed Robotics Middleware Framework (RMF). These tools are relied upon by hundreds of thousands of users and developers around the world.

Project: Robotics Middleware Framework (RMF)
As a Trainee, you will be working with the team to scale up RMF - a collection of reusable, scalable software libraries and tools building on top of ROS 2 that enable the interoperability of heterogeneous fleets of any robotic systems. It utilises standardised communication protocols to infrastructure, environments and automation where robots are deployed to optimise critical resources (e.g. robots, lifts, doors, passageways, etc). It also adds intelligence to the system through resource allocation and prevents conflicts over shared resources through the RMF Core.

8.

OTSAW

OTSAW is a global pioneer in advanced Robotics technologies and next-generation Artificial Intelligence for healthcare, security delivery and mobility applications to improve safety, business processes and everyday lives.

Project: Project OR
As a Trainee, you will be working on some of OTSAW's Robotics solutions for security, concierge, disinfection and delivery purposes. One such project is ORX - the world's first UV-C LED autonomous disinfection robot to be time & cost-efficient, environmentally friendly, and easily customisable to any aircraft configuration. The patented UV-C LED has been successfully lab-tested against live human coronavirus samples, achieving a disinfection efficacy of 99.9% within 5 minutes at a range of 2.5 meters.

PARTNER COMPANIES ONBOARD RUN 1

1.

AeroLion is a Singapore-based high-tech start-up focusing on solving modern industrial problems using UAVs. It was founded by PhD students and research scientists from the National University of Singapore. Its inhouse developed BlackLion series UAV products have unique GPS-less navigation and AI-based image analytics capabilities, and they are successfully used in applications including mapping and survey, building inspection, confined space inspection and warehouse stock taking. AeroLion's products and solutions have served various Singapore government agencies, local corporations and MNCs.

Project:
One of the most interesting products we are continuously working on and improving is the BlackLion-068 autonomous warehouse stock taking UAV. It optimises a full-day two men's work of stock counting down to only 15 min for a typical aisle in the warehouse. The UAV is programmed to take off from the starting point of the aisle, scan racks on both sides of the aisle level by level and then return back to the take-off point with all cargo tags decoded and located. The whole flight and data processing procedures are automated and with cm level 3D position accuracy. The next version of the product will be designed with a charging station so that the system becomes completely autonomous and operator free. At the same time, more application features like multi-aisle navigation, carton-level scanning and cargo searching will be implemented.

~~Garuda Robotics Pte. Ltd. is a leading developer of enterprise-grade drone and drone data solutions for enterprises, governments, and professional drone operators. Our products and services are deployed in the agriculture, infrastructure, security, and logistics industries throughout Asia to capture, analyse and leverage aerial data at scale.~~

~~**Project: DevSecOps Engineer- Security Operations, Compliance and Engineering (Project STAR)**~~
~~As a Trainee, you will be working on Project Star - a cloud security project that aims to attain a recognised cloud certification as a SaaS provider. The Trainee will hone their skills in security technologies e.g. encryption, access control and strong cloud security knowledge.~~

2.

From creating a laparascopic robot (the size of a fingernail), to having autonomous robots run in global manufacturing plants, to developing a SpacePlane demonstrator that was released at a height of 3,000 metres, HOPE Technik has consistently delivered high performance engineering solutions in an age defined by disruption.

~~**Project: Cybersecurity Product Development**~~
~~As a Trainee, you will develop Cybersecurity products that detect and stop sophisticated threats such as the recent SolarWinds attackers.~~

3.

Movel AI is a Deep Tech company building advanced Artificial Intelligence (AI) systems for robot navigation, providing a complete robot localisation and navigation solution based on advanced Computer Vision and sensor fusion technologies. This enables the robot to move in a complex environment. Movel AI's algorithm can remember vast amounts of visual features from the 3D environment and rely on these features to localise the Automated Guided Vehicle. The company's flagship product, Seirios, is the harmonisation of web and Robotics tech stacks; providing users with an easy-to-use interface to control their robotic mobility platforms.

Project 1:
Trainees will be working directly on the development and improvements of Seirios.

Navigation, localisation, mapping are some of the core features of Seirios which they will be refining and improving. Successful applicants will be able to work directly on these evergreen improvements, powering robotic mobility platforms of all shapes and sizes.

Project 2:
To work directly on robotic mobility platforms in the real world in diverse industries with different problems and challenges.

Selected candidates will have hands-on experience to install, integrate, and deploy Movel AI's software onto different robotic mobility platforms in various industries. These industries include: Logistics, Healthcare, Construction, Service, Hospitality and more.

4.

NDR Medical Technology Pte. Ltd develops surgical robotics known as Automated Needle Targeting (ANT) to assist surgeons during minimally invasive surgery. Driven by Artificial Intelligence and Medical Image Processing to automate the needle targeting procedure resulting in an overall improvement to the clinical outcome, reduces radiation exposure and overall operation time. ANT will ensure surgeons of all experiences to be able to perform complex and high-risk surgery with ease.

Project:
We aim to increase biopsy safety and accuracy using AI to plan the needle insertion location and angles. The AI system will recommend paths to the surgeon, upon confirmation, it will control a robotic positioning system for the biopsy. There is a real hospital application with clinician(s), and the apprentice will get the opportunity to work with experienced software engineers and AI experts.

5.

OCEANIA ROBOTICS

Oceania Robotics is a Singapore based Robotics company that manufactures pioneering autonomous Robotics solutions in the niche area of pest maintenance, ship maintenance and façade inspection. With a comprehensive product roadmap and an expert team of robot developers, the company delivers products and services that target pest control, inspection, cleaning, painting and paint stripping of the ship hull. With a full suite of Robotics platforms, Oceania Robotics brings several first of its kind autonomous and modular capabilities, significantly improving productivity, efficiency and safety.

Having established strong partnerships with pest control companies, local shipyards, maintenance contractors, universities, and support from governmental agencies, Oceania Robotics is very well positioned to be a global front runner in these newly emerging industries.

Project:
Falcon is a robot that patrols false ceiling environment to identify hotspot of rodent activities autonomously. The robot recognises and identifies rodent droppings via machine learning. Through recognition, it will identify the rodent activities and hotspot at the false ceiling. The robot will also able to collect the droppings to for cleaning and lab testing purpose while dispensing rodenticide at selected areas.

6.

Polybee

Pollination plays a massive role in global food security. Polybee is building autonomous solutions for pollination in those sectors of agriculture where natural pollinators cannot be used, and the only other way is to do so by hand. Our technology digitises the process of pollination and boosts yields with greater control. We achieve this using cutting edge

algorithms in Computer Vision, Deep Learning, and automation of drones.

Project:
Automation of Pollination in Greenhouses – In this project, the apprentice will be involved in the automation of drones in greenhouses and liaising with our Computer Vision and Software teams. The main objective is to build a drone platform using open-source hardware. He/she will work in a team to build and test an autonomous drone for flight in proximity of crops. This will involve working on the following subsystems such as state estimation of drones, perception of the greenhouse environment and motion planning for efficient pollination.

7. Weston Robot

Weston Robot is a Singapore-based deep-tech robotics company helping the industry accelerate robot adoption. Weston Robot provides a wide range of robot products and services, such as indoor and outdoor wheeled robots, tracked robots, quadruped robots, on-water boats, exoskeletons and robotics software. Weston Robot specialises in the embedded software framework and toolchain for robot deployment. Weston Robot's COVID-19 robots, such as disinfection robot, mask and social distance detection robot, have been used widely to cope with the pandemic. Weston Robot's core business now is developing robotics solutions to deal with challenges in post-pandemic. Weston Robot believes engineer is a superstar, and creates a transparent engineer-growing path for each engineer.

Project:
Weston Robot has a number of robotics projects focusing on the relief of post-pandemic challenges. Engineers have the opportunities to work with many deployed robots and make new deployable functionalities. Engineers can also work with the best engineers in the community to know the state-of-art workflow and toolchains.