

## TECH OFFER

### Agile Framework for Autonomous System Development and Deployment



#### KEY INFORMATION

TECHNOLOGY CATEGORY:

Infocomm - Robotics & Automation

Logistics - Inventory Management

Manufacturing - Assembly, Automation & Robotics

TECHNOLOGY READINESS LEVEL (TRL): **TRL8**

COUNTRY: **SINGAPORE**

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#### OVERVIEW

The technology presented here is a software stack (Agile Framework) for autonomous system development and deployment. This agile framework serves as a software container/launchpad for various autonomous technology related software modules. This includes localization and mapping, navigation and control, planning, perception, sensor fusion, HMI and others.

The agile framework also provides a suite of digital-twin simulation and modelling tools for developers to test and validate algorithms prior to deployment on real hardware. It is dockerized for quick and seamless deployment. Developers can quickly build up an autonomous system using this stack, like assembling a set of LEGOS. Simulation models can be used to carry out different experiments while the actual deployment can be done using docker.

## TECHNOLOGY FEATURES & SPECIFICATIONS

- Agile Framework: A software “container” that serves as a launchpad for various autonomous system/ technology software modules, including but not limited to robot/ sensor driver interface, robot platform control module, localization and mapping, navigation and path planning, perception, mission planning, etc.
- Extensible and reconfigurable: The stack uses \*.yaml file for configuration changes.
- Process management (spawn and kill) and monitoring in one view
- Resource management: memory usage, CPU loading, etc.
- Dockerized

## POTENTIAL APPLICATIONS

The software stack can be used for different use cases including -

- Autonomous system/robot development.
- Autonomous system software deployment.
- Engineering education: Robotics, autonomous system, drone, etc.

## UNIQUE VALUE PROPOSITION

Though there is a high demand for autonomous systems from different sectors, developers often face challenges in transitioning the innovative use cases to an autonomous system product. These challenges include but are not limited to - long product development cycle, high R&D cost, resource-intensive testing and deployment process, and decoupled user-developer development process.

The agile framework presented here offers following advantages –

- Reduced entry point requirement by applying a LEGO like approach to autonomous system development.
- Easier testing and deployment with a GUI interface and yaml based configuration.
- Reduced R&D cost and development time.