UP²

bridge the gap

intel IoT Solutions Alliance

intel ATOM x7 inside

intel MOVIDIUS inside

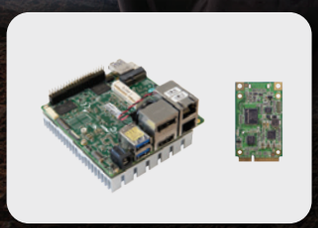
intel REALSENSE TECHNOLOGY

COGNITEAM

aws

ROS

ROS2



AI at the edge, powered by Intel®

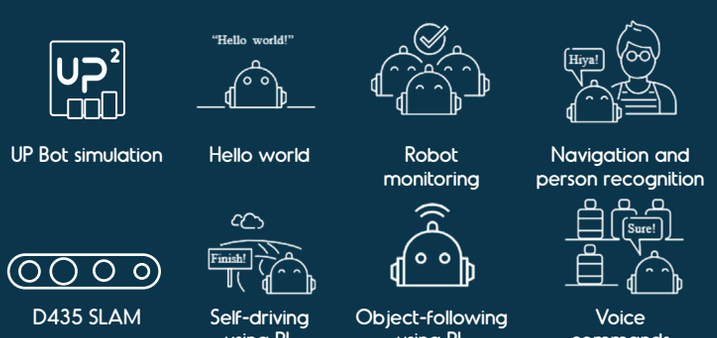
UP Squared RoboMaker Pro Kit

The new UP Squared Robomaker Pro kit provides an easy path building robotic project. The kit combines the expertise of a number of partners - Intel®, Cogniteam and Amazon Web Services to bring efficient computer vision technology to new places with revolutionary Intel® Vision products and allow users to develop AI and machine vision into their robots in as little as one day. With the right performance, cost and power efficiency at every node, you can scale vision technology across your infrastructure and unlock new possibilities for visual data.

Leveraging the power of AWS Robomaker which bridges the gap between the virtual testing environment and the field. The deep integration of hardware together with Amazon RoboMaker delivers an unprecedented experience for a developer, speeding up the time to production.

With all the essential components at your disposal, you can leverage this kit to build proof of concept that can quickly scale to production.

Sample Applications



Hardware overview

- UP Squared board with Intel Atom® X7-E3950 processor, on board 8GB DDR4, 64GB eMMC
- Passive cooler pre-installed*
- RealSense D435I camera
- AI Core X Mini PCIe card with the Intel® Movidius™ Myriad™ X
- Intel AC9260 WiFi kit
- Servo and DC motor with encoder
- Cogniteam Motor Control Board
- Wheels

Preinstalled Software

- Ubuntu* 18.04 desktop
- ROS1 - melodic/ROS2 - dashing
- Intel® Distribution of OpenVINOTM toolkit 2019 R3 release
- Intel® RealSense™ SDK 2.0
- MRAA and UPM I/O and sensor libraries for C++, Python*, Java, and JavaScript

Robomaker Pro kit Set-up Tutorial(Cogniteam Wiki):
https://wiki.cogni.io/Category:HamsterProKit

AWS Robomaker Simulation Tutorial(Github):
https://github.com/cogniteam/hamster_simulation

aws RoboMaker Service

easily develop, test, and deploy robotics applications

Cloud Extensions for ROS

Development Environment

Simulation

Fleet Management

Key differences ROS vs ROS2

Features	ROS	ROS2
Platforms	Tested on Ubuntu, Maintained on other Linux flavors as well as OS X	Currently CI tested, Ubuntu Xenial, OS X El Capitan & Windows 10 Supported
C++	C++03 // don't useC++11 features in its API	Mainly uses C++11, Start and plan to use C++14 & C++17
Python	Target Python 2	>= Python 3.5
Middleware	Custom serialization format (transport protocol + central discovery mechanism)	Implementations are currently based on the DDS standard.
Unify duraction and time types	Duration/time types defined in client libraries; C++ and Python	types are defined as messages and are language independent
Components with life cycle	Every node has its own main function.	Tools like roslaunch can use life cycle to start a system composed of many components
Threading model	Choose between single or multi-threaded execution.	More granular execution models and easier custom executors
Multiple nodes	Not possible to create multiple nodes in a process.	Possible to create multiple nodes in a process.
roslaunch	Roslaunch files are defined in limited XML	Launch files are written in Python enabling more complex logic like conditionals etc.
AWS Robomaker		Cross-Compiling Applications with Colcon, Capturing log data with rosout

Easy upgrade to PoC and scale to production

UP is a brand founded by AAEON Technology Europe in 2015. The UP team is aiming to bring innovation in technology, business model, and integrated solution. With its agility, the UP team collaborates with market leaders in different vertical markets to bring integrated solutions and build a large online community to work closely with developers.

Cogniteam is a technology start-up, in the area of autonomy control for robotics and interactive simulations. Their goal is to become a world leader in robotics and and simulation markets requiring high levels of autonomy and intelligence.

www.up-board.org/ www.up-shop.org /www.up-community.org