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.

**Hardware overview**
- UP Squared board with Intel Atom® X7-E3950 processor, on board 4GB 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 OpenVINO™ toolkit 2019 R3 release
- Intel® RealSense™ SDK 2.0
- MRAA and UPM I/O and sensor libraries for C++, Python*, Java, and JavaScript

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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

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

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 simulation markets requiring high levels of autonomy and intelligence.

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