

trinity

# OBJECT CLASSIFICATION MODULE

## PRODUCTION MANAGER TUTORIAL

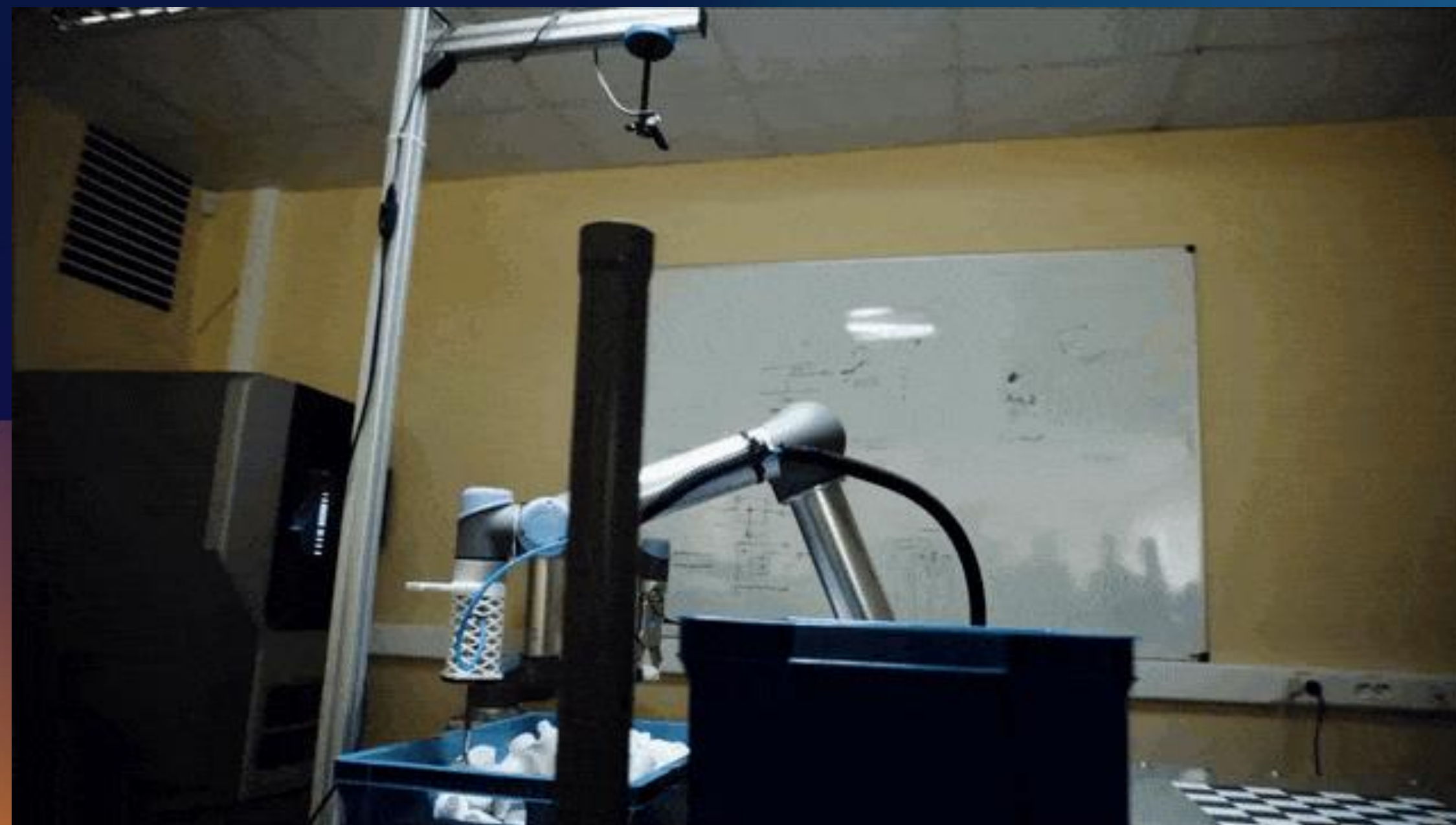
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The TRINITY project has received funding from the European Union's Horizon 2020 research and innovation programme under the GA 825196

# Purpose of the module

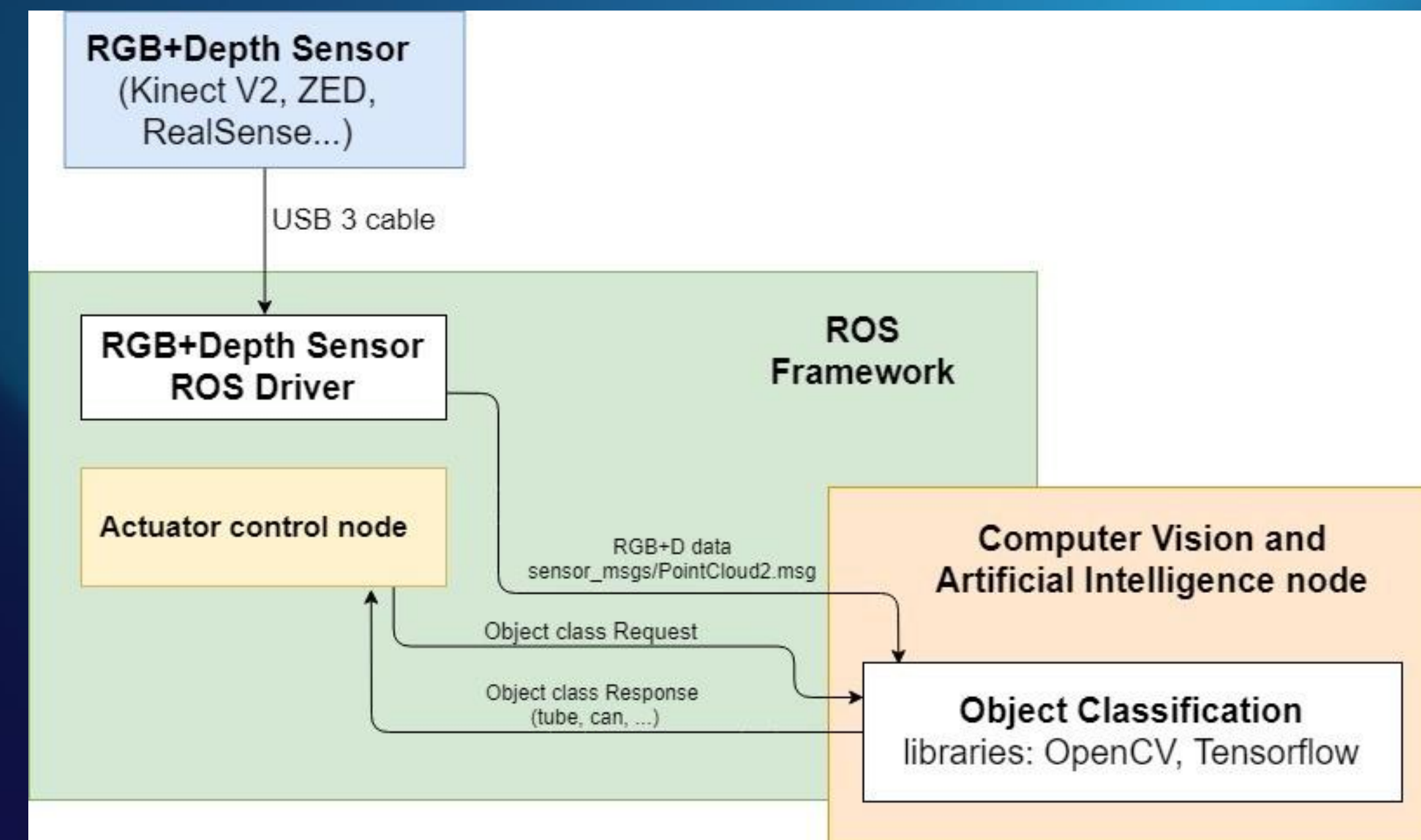
- Perceive the changing environment (receive color frames and depth information of a region of interest from a camera sensor and extract the features about the objects of interest)
- Modify systems actions accordingly (extracted information can be used in control of different kind of mechanisms or assuring that the right type of object has been put in the machine)



# Module components

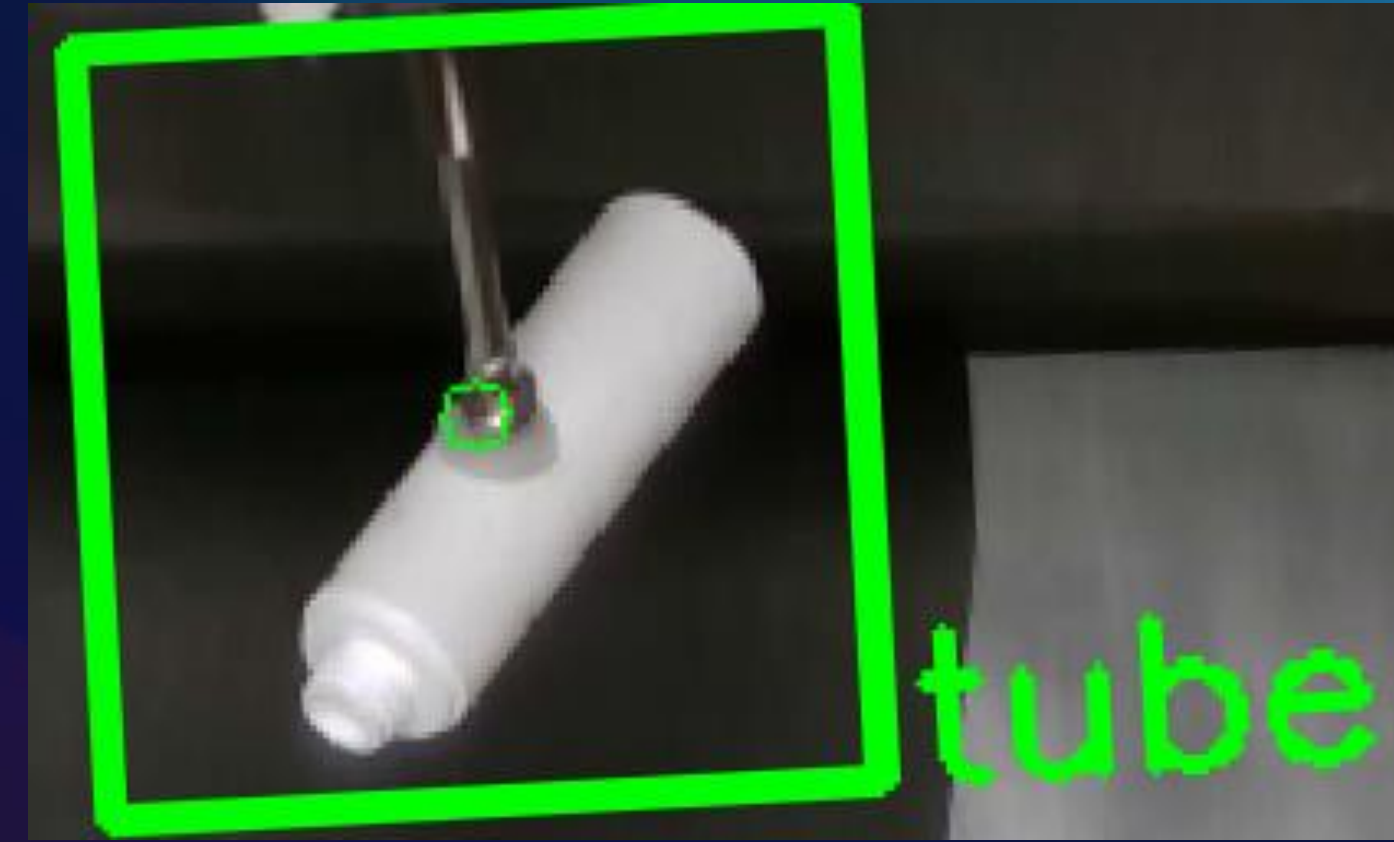
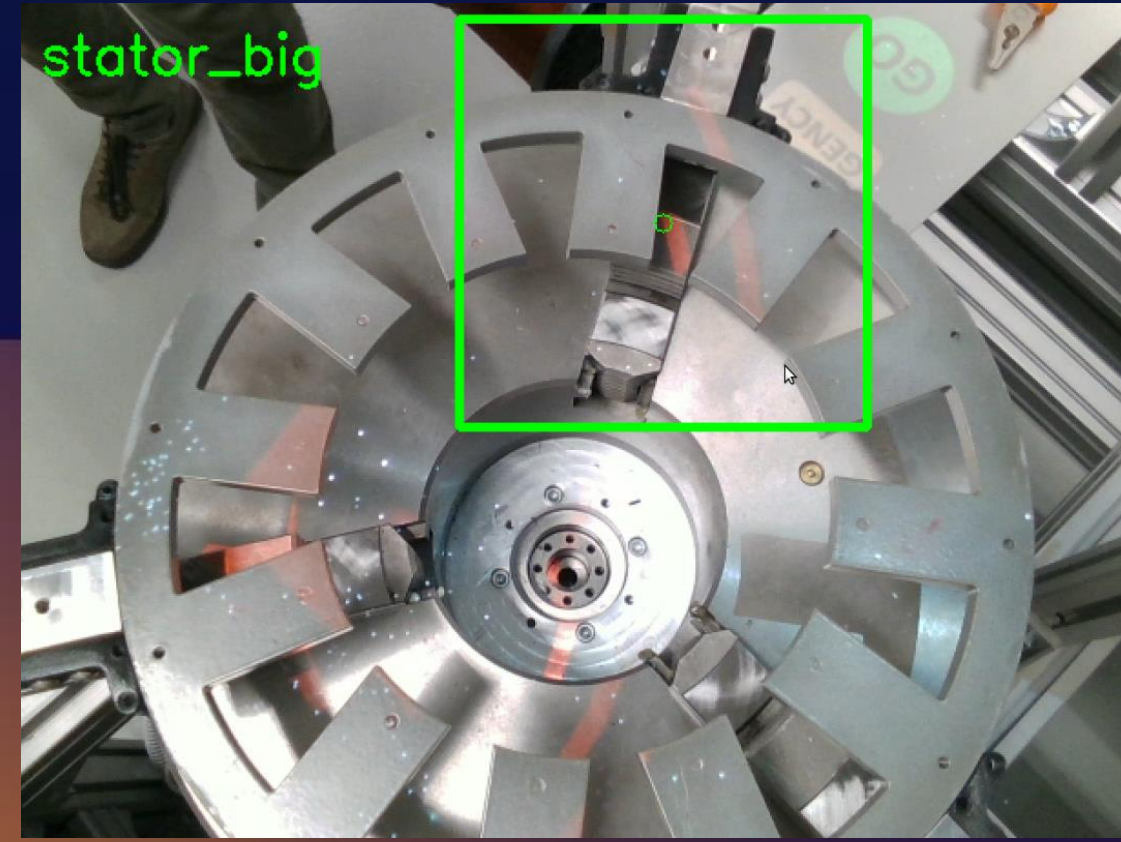
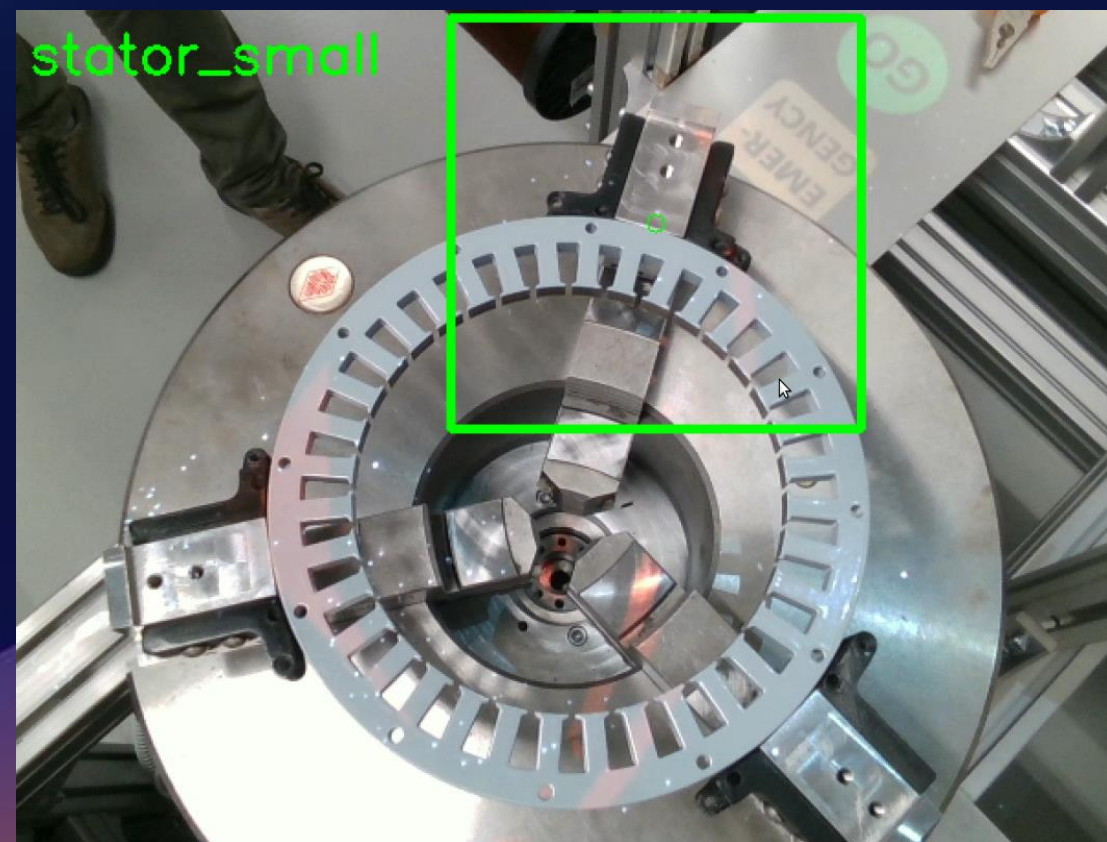
- The following hardware is used in the setup:
  - Workstation (Standard desktop PC with modern graphics card)
  - RGBD camera (Any ROS compatible device if the data can be published as PointCloud2)
  - Actuator (Industrial robot or any other actuator that can benefit from object classification)

All the data is transferred via a standard ROS transport system with publish/subscribe and request/response semantics. This module subscribes to RGB+Depth sensor data and produces requested object class



# Environmental requirements & adaptability of the module

- No specific environmental requirements, the module can work with wide variety of objects and integrated into variously sized systems. All the requirements mostly are hardware specific, especially for the RGBD cameras used. For example - for big objects a camera with respective field of view should be used, that covers the region of interest.
- The module can also be used



# Integration

- The module integration consists of the following steps:
  - Mount and setup the camera, to acquire the data in ROS framework as PointCloud2 .
  - Acquire the training data (at least 1000 images of each class to ensure the average classification precision  $< 99\%$ ). The maximum amount of the different object classes is not specified, the system has been tested with 7 different types of classes.
  - Training (can be done on standard desktop PC with a modern graphics card to accelerate the training process)
  - Deploy the model using the ROS framework.



# Object classification module

This module is available after an agreement with EDI, if you are interested in this module contact us:

<https://www.edi.lv/en/contacts/>

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## Thank you!

Institute of Electronics and computer science



[info@trinityrobotics.eu](mailto:info@trinityrobotics.eu)



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