Progress Report

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Goal of the Project:

The project aims to optimise prosthetic grip shape and force using Machine Learning methods. A classifier for holding objects' types will be built using proprioceptive (force/proximity) sensing and evaluate its performance. Data collection from multiple sensors at selected positions while grasping objects will be recorded and used to train the Machine Learning model for this classifier. As a result, the knowledge acquirement about possibility and accuracy for classifying different object types, as well as where the proprioceptive sensors should be placed is expected.
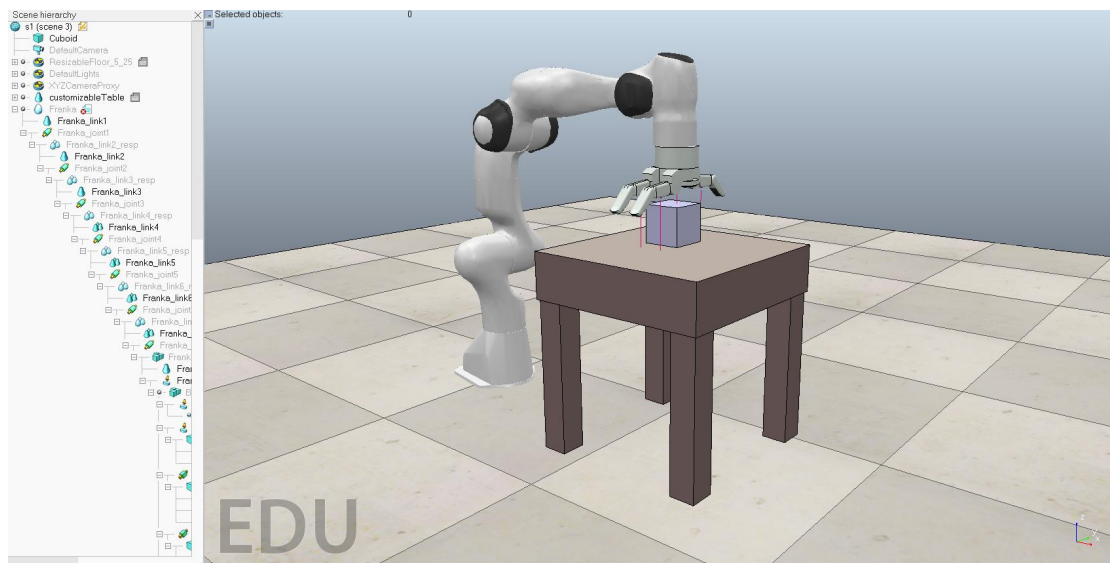
Methods:

Software simulation: Due to the COVID-19 situation, the experiment and data collection parts are now delivering on the robotics simulation platform CoppeliaSim.
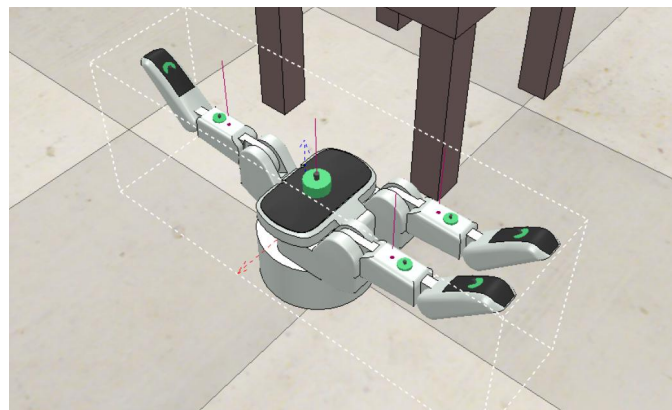
Machine learning methods to train the collected data: logistic regression, decision tree, random forest, LSTM, other types of neural networks, etc.
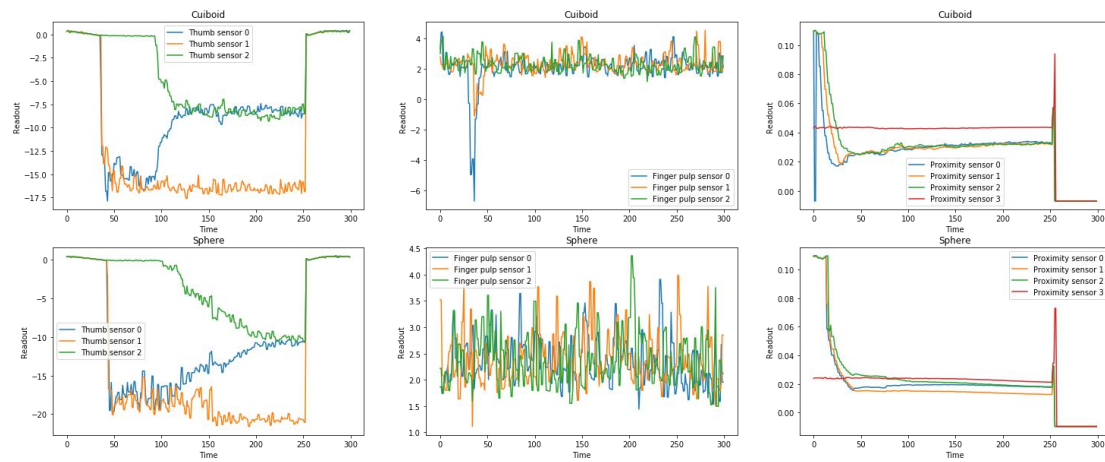
Have accomplished so far:

1. Construction of test system on CoppeliaSim.

2. Placement of sensors.

3. Python API script to run the system and collect the readout of sensors.
4. Initially collect and check the data upon different objects.

Things remaining to be done:

1. Try different machine learning methods to train the model for these data collections.
2. Evaluate the performance.
3. Final dissertation.