Mounting An AGX ORIN Onto A Reachy Robot

## Overall goal

The aim of this internship was to integrate a Jetson AGX Orin Developer Kit with the Reachy robot by first developing an understanding of both platforms and how they operate. This included learning to program the Reachy in Python, designing a 3D-printed holder to physically attach the AGX Orin, and creating a step-by-step guide for the process. In addition, an efficient communication method between the two computers was established to ensure seamless interaction.

## Background

Before beginning the integration of the two computers, I studied Reachy’s documentation[[1]](#footnote-1) to gain a thorough understanding of its components and the various methods for connecting and controlling the robot. This included exploring connection options such as Wi-Fi and Ethernet. During this learning phase, I used a workstation PC and a Wi-Fi connection to develop code for teleoperating the robot with an Xbox controller, as well as performing waypoint tests and basic arm movements (further detailed in the *Extra Learning* section).

In addition, I developed CAD modelling skills using the Onshape creation tool to design a custom holder for attaching the AGX Orin to the base of the Reachy. I also researched suitable equipment, such as wires and batteries, to provide power for the AGX Orin.

## Equipment

The following equipment was used in the process of mounting the AGX Orin onto Reachy:

* Nvidia Jetson Orin AGX
* K&F Concept 99Wh Battery
* SZRMCC USB-C to DC Power Cable  
  Ethernet cable
* PLA filament
* HDMI cable
* Monitor
* 4 × 3 mm × 40 mm screws, 4 × 3 mm nuts, 4 × 3 mm washers
* 2 × 3.5 mm × 15 mm screws, 2 × 3 mm nuts, 2 × 3 mm washers

## Process

## CAD model

To mount the AGX Orin, I designed a 3D-printed holder composed of four main parts:

1. Tray – Holds the AGX Orin with a dedicated slot for the power buttons to prevent accidental triggering, as well as an opening to access all ports.
2. Clamp Piece 1 – Attaches to Reachy’s support pole and, together with Clamp Piece 2, secures the tray in place.
3. Clamp Piece 2 – Reinforces the attachment around the pole.
4. Legs – Elevates the tray to ensure it does not obstruct the LIDAR sensor, which is essential for collision detection.

## Process – Setting up the Reachy

1. Connect the reachy to monitor (HDMI).
2. Assign a static IP (I used ping 192.168.100.1) to Reachy.
3. Disconnect the Reachy from the Monitor

## Process – Setting up the AGX

1. Connect the AGX Orin to the K&F battery (DC cable) and a monitor (HDMI).
2. Using the initial startup flash the AGX’s system
3. Then install **Python 3.8** along with the **Reachy SDK** and **ROS 2**.
4. Assign a static IP (I used ping 192.168.100.100) to the AGX.

## Process – Physical Mounting

1. Connect AGX Orin to Reachy via an Ethernet cable.
2. Verify connectivity by pinging Reachy from the AGX Orin.
3. Place the K&F battery inside Reachy’s base and secure it with Velcro, ensuring the power cable reaches the AGX Orin through the gap around the pole.
4. Assemble the 3D-printed holder:

* Attach Clamp Piece 1 (part 2) and Legs (part 4) to the Tray (part 1) using 3 mm screws, washers, and nuts.
* Attach the holder onto the support pole using Clamp Piece 2 (part 3) with 3.5 mm screws, washers, and nuts.

1. Insert the AGX Orin into the holder to complete the mounting process.

## Extra learning

* Talking in more detail about testing with python sdk (or move this bit to background)

1. <https://pollen-robotics.github.io/reachy-2021-docs/> [↑](#footnote-ref-1)