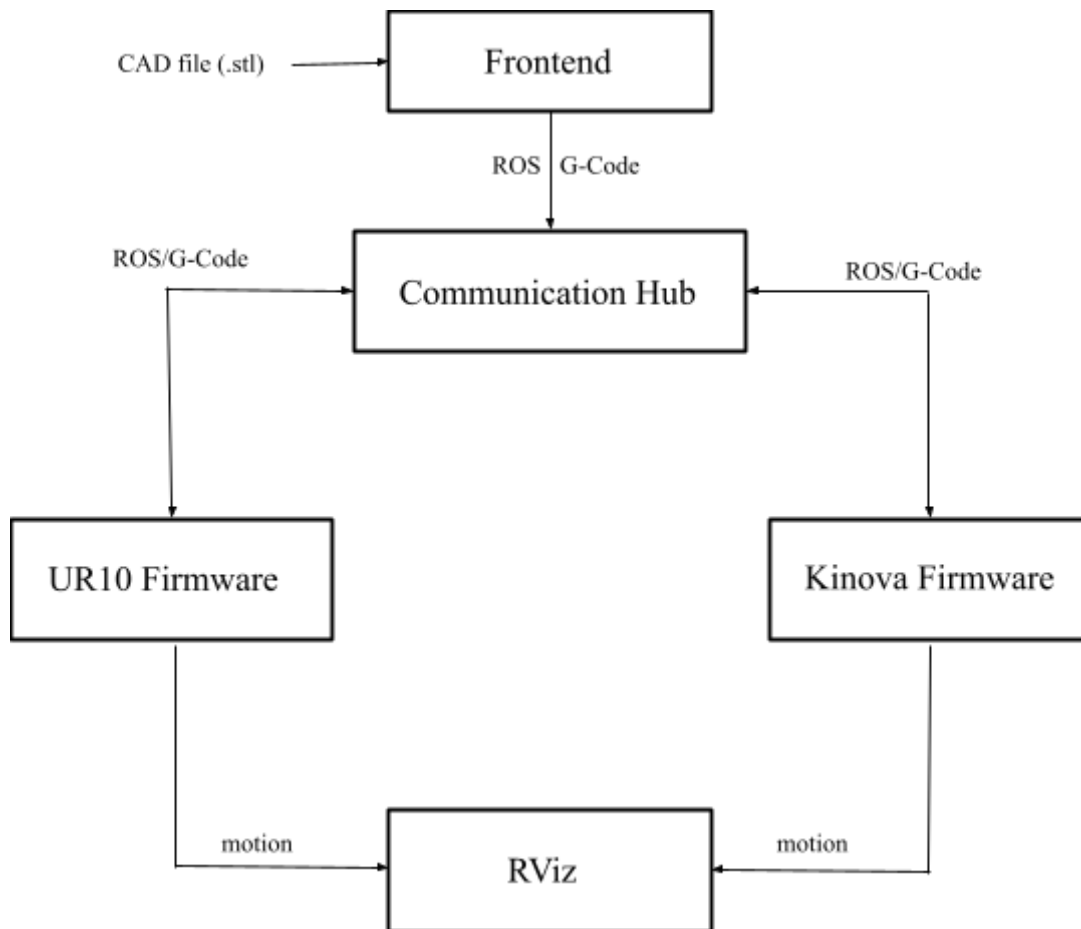## Objective

The objective of this project is to simulate 3D printing with at least two different brands of robotic arms working together. The entire process should begin with a CAD file (specifically STL) and end with the printing of the object having been simulated.

Module 1: Frontend

The frontend should allow for the upload of a CAD file (.stl) from the user. The frontend can be as simple as a command line interface. It should use an open source slicer to convert the CAD file into an initial G-Code file. The G-Code file should go through a post-processor to be split into a file for each robotic arm. Pause and Resume commands should also be inserted into the G-Code here. These files will then be outputted to the communication hub.

Module 2: Communication Hub

The Communication Hub is where all of the communication should happen. This is where the communication using ROS will be sent to the arms telling them to pause and resume. The robotic

arms will send ROS communication back to the communication hub as well as telling the status of the print.

Module 3: Firmware

The Firmware should convert the G-Code received from the communication hub into the robotic arms native language. It should use MoveIt to calculate the robotic arms' trajectories. This is where the customization to each brand of robotic arm takes place.

Module 4: RViz

RViz should be used to simulate the movement of the robotic arms along with the extrusion of the filament.