



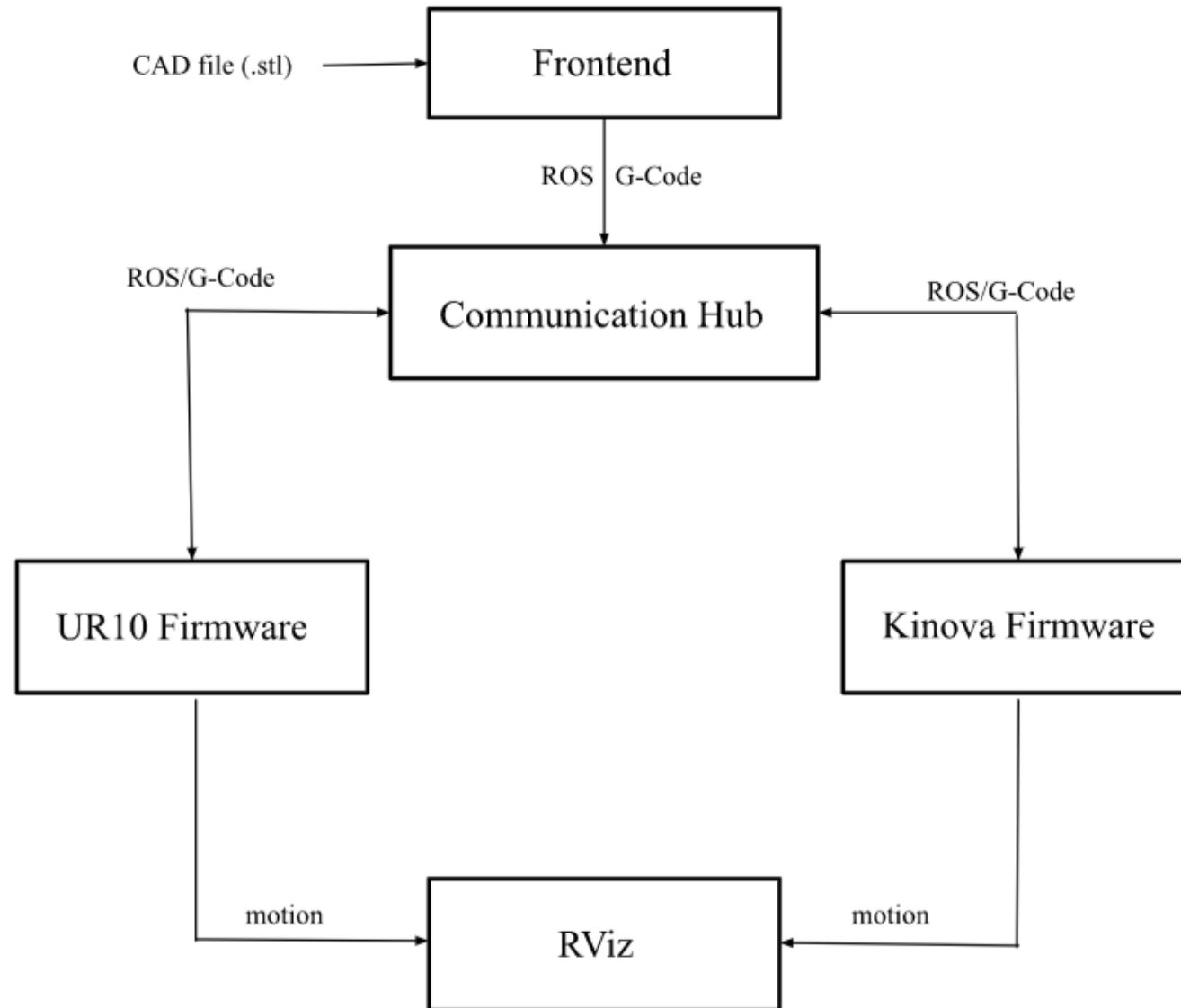
Cooperative Robotic Arm 3D Printing

Team 16

Project overview

- AMBOTS is working on swarm 3D printing. We want to create the ability to print a single 3D object using multiple robotic arms.
- To do this, we will create a software that can take in an STL file from CAD software and handle the management of the multiple robotic arms.
- We will have a front end that you can upload an STL file to. Then this frontend will slice of the STL file and extract the individual commands. Those commands will be sent to a communication hub that will send the commands to the robots as well as handling communication between the robots. The firmware for each arm will convert the commands and execute the arm movements.

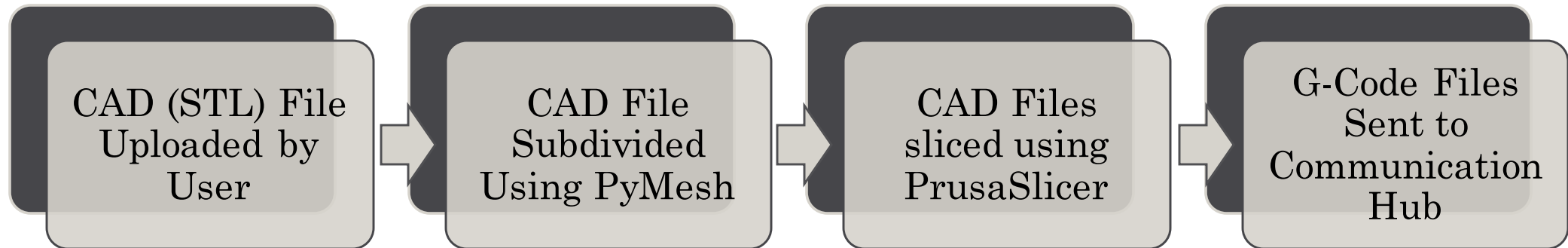
Design



Frontend

Currently just using a CLI

A GUI is not required, but will be added if time permits



Communication Hub

- The communication hub will take in the G-code from the front end, insert any necessary pause or resume commands, then send the commands to the firmware of the robots.
- Communication between robots is necessary. However, direct communication is not possible between robots of different brands. To solve this, robots will communicate through the communication hub.

Firmware

- The firmware is the interface to the physical robots and their movement. It takes in the commands from the communication hub and sends them directly to the robot itself.
- Each robot has their own way of receiving command so each robot will have its own firmware node. Cross communication between these nodes is handled by the communication hub from the previous slide.

Demo

- <https://youtu.be/tJq-ug1s9f4>