Deliverable F. Prototype I and Customer Feedback

Group 1

GNG 1103 – Engineering Design

Faculty of Engineering – University of Ottawa

March 6, 2022.

Client Feedback from client meet 2:

End effector and UI initial plans were meeting needs and wants. The safety protocols need more finetuning to be acceptable for use by the client.

Utilizing the client feedback, the safety mechanism was looked over and revamped into an impact sensor that will tell the arm it has bumped into something and needs to shut down so that the motors are not strained, and no objects involved will sustain more damage.

Simple Analysis

CAD model of camera end-effector

- Through this prototype we explored two flaws in our initial design for the camera-light end effector. The first one being the connection mechanism, we realized that the ball joint connector was not very compatible with the type of locking system present on the arm. Secondly, we realized we needed more space in our disk to store the electrical hardware components, so we had to increase the thickness of the disk that houses our lights and camera for the end effector.

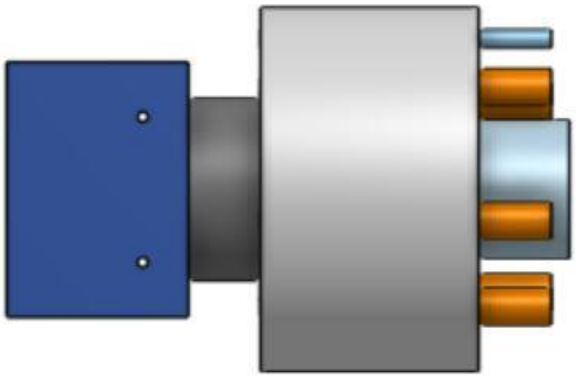

Figure 1. Camera End-Effector Model View 1

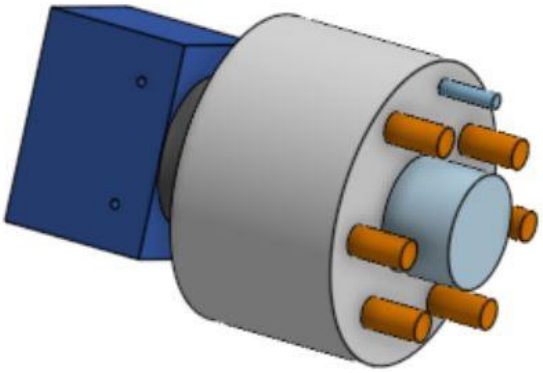

Figure 2. Camera End-Effector Model View 2

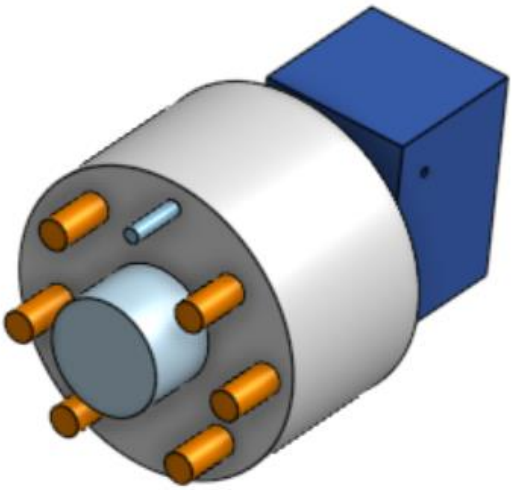

Figure 3. Camera End-Effector Model View 3

Prototype 1 test plan: Select optimal User Interface

- Why: Ensure operator can easily interact with robot arm and easily select clear boundaries of operation.
- How: Develop UI software and have random untrained people interact with the UI and use their feedback in determining which highlighting method and menu option to use
- When: UI complete and ready by Sunday, March 13

Current bugs to be fixed:

Dropdown menu retracts whenever left click is released. Need to make sure that when button is clicked dropdown menu remains for user to interact with.

Prototype 2 test plan: Ensure connection between arm and effector design is viable

- Why: Ensure robot arm can support end effector before funds are allocated towards construction of end effector.
- How: Calculate weight of end-effector based on CAD-MODEL centre of mass and ensure it is within the carrying capacity of the arm
- Assuming the weight and carrying capacity are correct- we may stop the prototyping process when the arm can support our end effector
- If it cannot be supported- different connections will be tested until weight of end effector is supportable
- When: Before Wednesday March 9th