

# PROJECT PROPOSAL

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## **“But I have no hands!” A Study on the Effect of Anthropomorphization on Bystanders’ Willingness to Help a Robot**

### **Introduction**

We want to evaluate how bystanders act in proximity to a task-driven robot in need of help. Further, we want to evaluate if anthropomorphizing the robot, by adding eyes to the design of the robot, affects bystanders’ behavior.

There is a growing body of research on the effects of anthropomorphizing robots, including adding eyes, on people's willingness to help them.

Some sources useful for hypothesis and methods:

- J. Sung, H. I. Christensen and R. E. Grinter, "Robots in the wild: Understanding long-term use," *2009 4th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, La Jolla, CA, USA, 2009, pp. 45-52.
- Li L, Li Y, Song B, Shi Z, Wang C. How Human-like Behavior of Service Robot Affects Social Distance: A Mediation Model and Cross-Cultural Comparison. *Behav Sci (Basel)*. 2022 Jun 22;12(7):205. doi: 10.3390/bs12070205. PMID: 35877275; PMCID: PMC9311498.
- Straub, I. 'It looks like a human!' The interrelation of social presence, interaction and agency ascription: a case study about the effects of an android robot on social agency ascription. *AI & Soc* **31**, 553–571 (2016). <https://doi.org/10.1007/s00146-015-0632-5>
- Luria, Michal & Hodgins, Jessica & Forlizzi, Jodi. (2018). The Effects of Eye Design on the Perception of Social Robots. 10.1109/ROMAN.2018.8525767.

### **Research Questions**

**RQ1:** How do bystanders act when they see a robot in need of help?

**RQ2:** Following RQ1, does this behavior change if the robot has eyes (robot is more easily anthropomorphized)?

## Study Design

In order to answer RQ1, RQ2, we need a study setting with a mobile robot that appears to be doing a task that is suitable for the place where the study is carried out. The robot should have an accidental thing happen that will affect the ability of the robot to complete the task.

*DeliveryBot: A package delivery robot*

- In this scenario, DeliveryBot is a package delivery robot that is wizarded by the researchers. It should look somewhat like a utility cart. One of the packages suddenly drops, and the robot cannot pick it up. The robot wiggles around the object.
- We observe the reactions that this behavior will elicit in people around the robot

This should be a between-subject design (each participant only experiences one condition).



## Data Collection Considerations

We will require locations with good internet/wi-fi, good lighting, and a camera+mic on the robot, as well as fixed cameras placed around the area to capture interactions from different angles. We realize this limits some of the places we can consider for our experiment, but we aim to collect data at various times and public locations on the Cornell Tech campus as well as other Roosevelt Island or New York City locations.

## Design Considerations

The primary design considerations we have when building are robot is

- 1) It needs to be able to reliably drop the package
- 2) The body of the robot should be designed to safely accommodate that motion without harming the robotic platform or anyone nearby
- 3) It should look sufficiently robotic and purposeful that bystanders are intuitively given the impression it is a robot and it is moving about with some purpose.
- 4) Eyes can be modularly added to the robot to see the effects of varying degrees of anthropomorphization

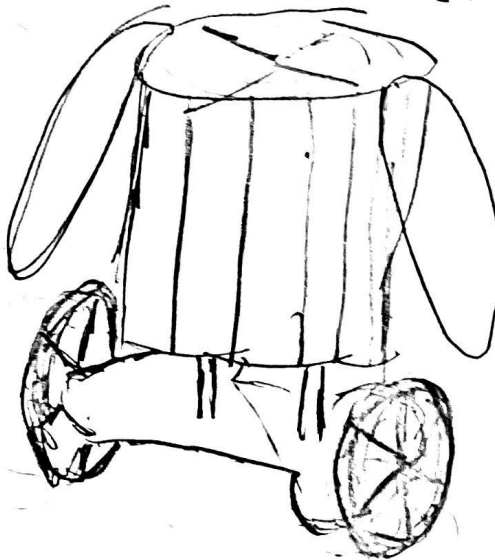
In order to do this we will create a lightweight frame that is tall enough or wide enough that it will hit the ground first before any components of the robot. The camera will be placed in between

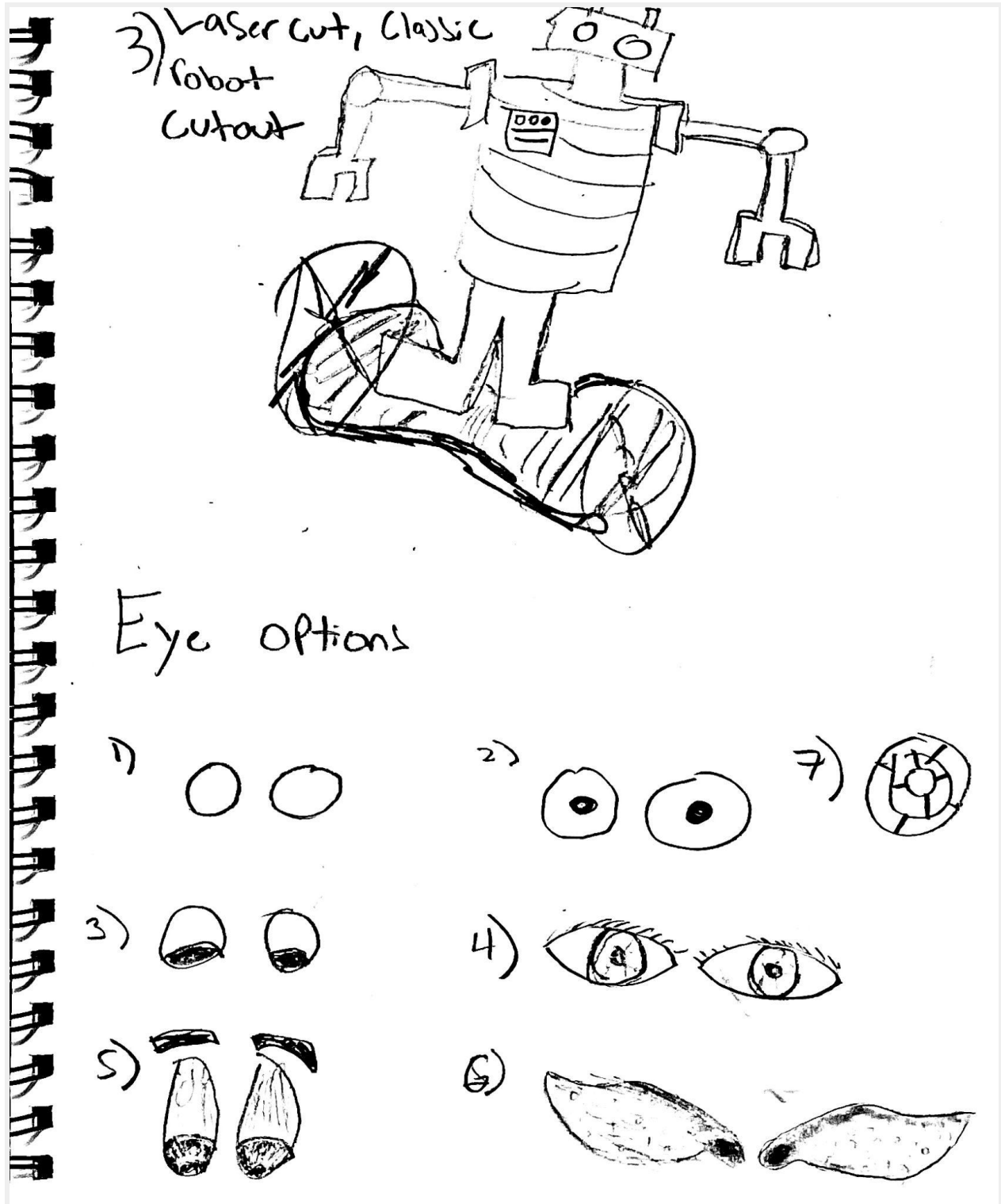
the legs of the supports of the robot's frame and angled upward. This will allow us to see what is in front of the robot for data collection or further augmentation / automation. It will also be close to the ground and well supported by the hoverboard platform with the addition of fasteners.

1) Kirby like w/ an exercise ball



2) Eve from Wall-E inspired w/ trash can





1. Hoverboard is programmed mainly in Python. Clonebot, which features a ESP32 microcontroller, is programmed in C. Describe what you expect to use for your software stack.