**Block Stacking Robot**

In our proposal, we aimed to model a robot arm in Gazebo which uses a computer vision algorithm to detect cubes. To further develop this concept, we will use the kinematics package MoveIt in Gazebo to move the arm into a desirable position. We have successfully downloaded and integrated in Gazebo the Franka Emika Panda robot arm (model available on GitHub: <https://github.com/justagist/panda_simulator>), and have also generated appropriately sized boxes for it to stack.

A screenshot of a video game

Description automatically generated

Following up on feedback received after the project proposal, we have narrowed down our scope for ‘Computer Vision Algorithm’. The algorithm must be able to detect the location of boxes, decide which box should serve as the base of the stack, and plot paths between the box locations. We will primarily focus on the ‘Haar Cascades’ algorithm to detect box location, which primarily focuses on edge and corner detection (good for boxes) and compare its performance to other computer vision algorithms such as ‘Hough Transforms’ (also good for detecting boxes).

Potential showstoppers: Frank’s gazebo is unable to render the panda arm. Abigail’s computer can run gazebo with the arm without issue. We are both using virtual machines. Some other gazebo models were tried and ran into problems accessing gpu resources; these problems were resolved by downgrading to a more primitive render engine.

Figure 1: abigail didn't zoom in enough