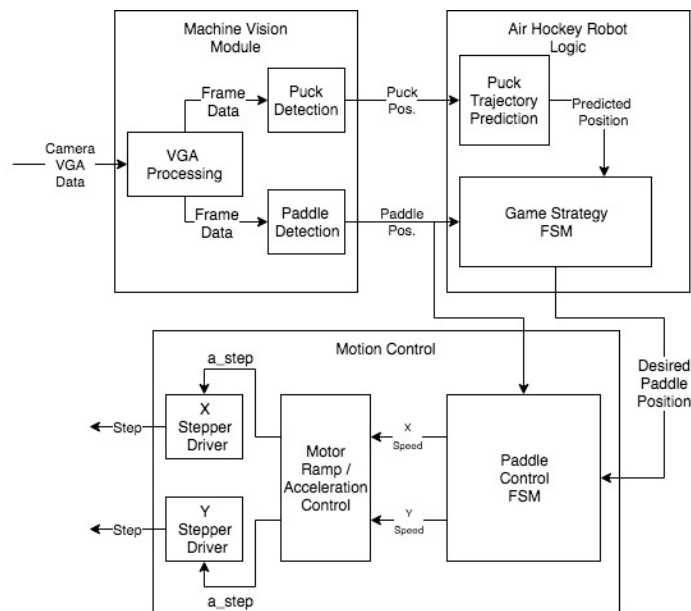


Final Project Abstract
6.111 Fall 2018

Inspired by the pong lab, our team has decided to build a robot to play air hockey, which is essentially the same game with 1 more degree of motion. The air hockey robot system design will tentatively be as follows:



The air hockey robot consists of 3 main parts: a machine vision module, air hockey robot logic module, and a motion control module.

- Machine vision module: responsible for processing camera VGA data, buffering it into a frame and then processing the frame to isolate the position of the puck and paddle. It then passes this information onto the air hockey robot logic module. We anticipate the machine vision module to be the most challenging aspect of the design.
- Air hockey robot logic module: implementation of an “AI” that predicts the trajectory of the puck (accounting for bounce off the walls) and outputs a desired paddle position based on a game strategy which we will implement.
- Motion control module: controls how to actuate stepper motors to move paddle. An important consideration with stepper motors driving a load is that they will need to be ramped (accelerated) to avoid stalling. This module will ensure that we move the paddle in the most efficient way possible.

Note: There is a substantial mechanical element to this project, but we have that mostly taken care of. Some parts will need to be machined/manufactured but it should be fairly straightforward as they can be 3D printed.