Looks good. Believe it or not, I don't think anybody has yet implemented fiducial-based localization as a course project. If I were you I would check out the AprilTags library first, it seems newer and possibly better than artoolkit. Though I have never actually used either. It will be most cool if you can combine observations of multiple tags to estimate the robot pose. The lecture on EKF localization tomorrow will introduce one approach for that.

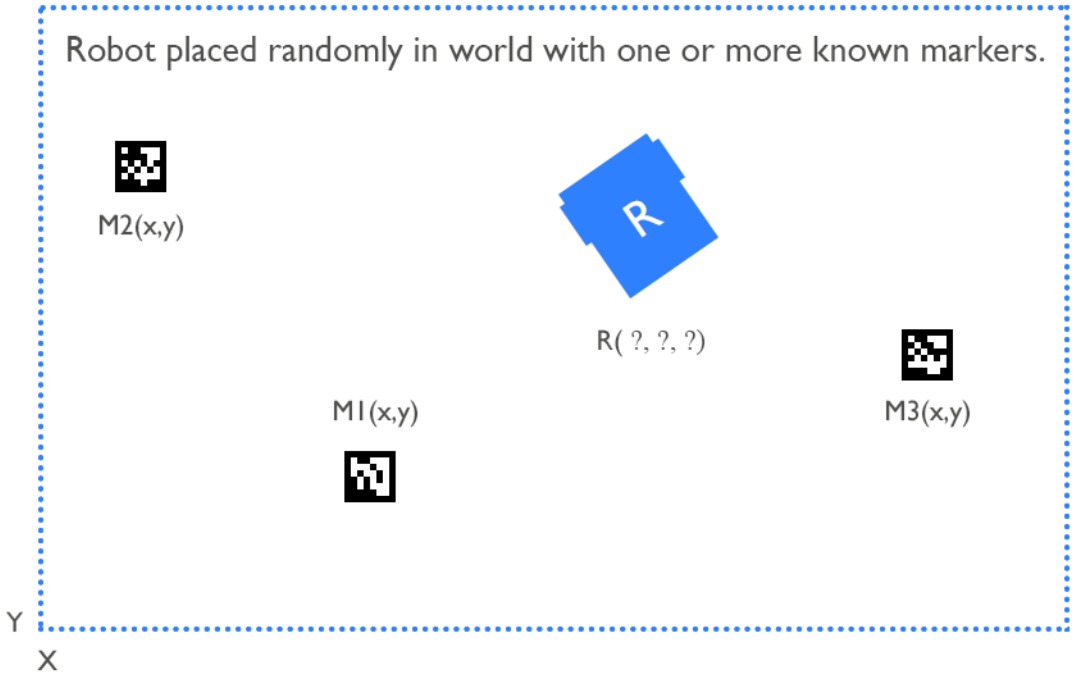
LAB 5 PROJECT PROPOSAL

Both Zach and Nick would have liked to do SLAM (Simultaneous Localization and Mapping) for the final project. Due to time and difficulty constraints, this is not possible, so we have decided to work on a smaller subsection of SLAM, localization.

The premise of the project is that the robot has been kidnapped, and it doesn't know where it is located in the world frame. Using a previously held map of its environment it must calculate where it is located and head to a location that we give it at run time.

The features that we will use to localize the robot will be either a series of colored strips located throughout the environment, or black and white markers from AprilTags or ARToolKit.

In order to calculate our location using these features, we will use a camera attached to the robot. This camera will either be the monocular camera used in previous labs or a Kinect camera given to us by Professor Vona for the purpose of this project. In order for the Kinect to work with the robot, we may need to swap out the PandaBoard used in previous labs with a more powerful netbook. This is because the PandaBoard may not support high enough usb bandwidth.


Robot placed randomly in world with one or more known markers.
M2(x,y)
R
R(?, ?, ?)
M1(x,y)
M3(x,y)
Y
X