Robotics Project Proposal

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**Project Title:** Screwabot

**List of Team Members:** Jason Sebek, Juan Vallejo, Ishrat Arora

**Role of Each Team Member:**

* Jason: Matlab image processing, Prototyping
* Juan: Controls software, Image processing, Prototyping
* Ishrat: CAD, Prototyping, Controls

**Brief Summary of Project and Goals:**

Plan A: Using 4 dynamixels, make a 4 DOF serial manipulator that is capable of:

1. Identifying small metallic objects in its workspace using a webcam and a computer vision algorithm
2. Picking up identified objects with the help of an electromagnet
3. Placing objects outside the working field

Plan B: Using 4 dynamixels, make a 4 DOF serial manipulator that is capable of:

1. Identifying a fiduciary marker using a webcam and a computer vision algorithm
2. Placing the end-effector on top of the marker

Inspiration: <https://www.youtube.com/watch?v=bL8fScdBOos>

Goals:

1. CAD the entire robot and manufacture it
2. Matlab code for computer vision
3. Matlab/python code for dynamixel interfacing
4. Testing

**Required Hardware from Laboratory:**

* Dynamixels
* Webcam

**Required Hardware to be Fabricated or Purchased:**

* Plain color surface
* Links to build manipulator
* Miscellaneous hardware for fastening
* Electromagnet to pick up metal parts
* Frame for the camera

**Timeline of major milestones:**

* CAD of the robot (Week of 21st Oct.)
* Build the robot, finalize CAD (Week of 28th Oct.)
* Image processing code, finalize mechanical design (Week of 4th Nov.)
* Robot control code, finalize image processing (Week of 11th Nov.)
* Testing and refining (Until Presentation)