EE/CprE/SE 491 - sdmay19-31:
Multi-Purpose Automated Robotic Mixer (mpARM)
Week 14 Report
March 25– April 5
Client: Alexander Stoytchev/Brett Altena
Faculty Advisor: Alexander Stoytchev

Team Members

Drew Caneff — *3D Printer Specialist/CAD Designer/Accountant*
Amos Hunter — *Electromechanical Specialist/Meeting Scribe*
Brett Altena — *Meeting Facilitator/ Computer Vision Developer*
Kristian Wadolowski — *Report manager/Front-end programmer/Computer vision Developer*
Jase Grant — *Embedded Systems/ Assignment Manager*

Summary of Progress this Report

- **FPGA-** Searching the internet for tutorials on how to do this in python.
  looking in to see if I can still make a pipeline and use the python code for the FPGA instead of having to use the PYNQ framework.
  PYNQ framework is all in python and I know some python, but not enough to do this.
  Was able to find a way that might be possible to use the pipeline and the python code.
  Since I was able to find some library's for the python the chances of actually doing this is a lot better, but is still very slow going.
- **Frame-** Measured the large piece of plywood base to fit the dimensions of the frame
  Marked these measurements with a straightedge and pencil
  Went to the college of design workshop with Drew and used a table saw to cut the new base piece out
  Marked the locations of where to draw pilot holes and screws for fitting the frame to the baseboard
  Used the electric drill to first drill pilot holes, then countersink the holes on the bottom of the board so that the heads of the screws would not scratch what the machine was set on.
  Screwed the frame to the base with a screwdriver
  Measured the aluminum strut on the frame to find where to put the camera
  Marked these locations with a pencil
- **Arm-** The initial testing for the robot was completed. Using the Asgard GUI to move the motors of the robot we discovered that the Arm was unresponsive. The wiring for the arm will need to be checked, and troubleshooting will need to begin.
  Fixed articulation 5-6 without the need to 3D Print. Ended up grinding into the collar piece of articulation 5 as well as upper portion of articulation 4 and inserted multiple bolts to secure both articulations together. Because the collar channel runs far deeper now, the bolts do not slip out from collar. With multiple bolts the weight of articulations five and six is more spread out so the loss of material will not effect the structure structurally. Early testing shows the articulation is able to turn and function as intended, so for now this portion of the project can be labeled a success.
  Limited amount of current which could be drawn by each motor to about 0.5 to prevent the motors from burning out. Being cautious as burning out a motor could spell disaster for our group. Adjusted current by using potentiometer on each motor controller and following the equation found on the motor controller's data sheet.
- **Pancake image gathering-** The next thing was the making and recording of pancakes using the griddle. The first attempt failed when I attempted to use batter that was 2 days old. The raw eggs inside the

batter became rotten and unusable. The next attempt used batter that was 2 hours old and there appeared to be a slight variation in the cooking of the pancake. We are unsure if this is due to the batter sitting for a couple hours or it was a coincidence. The next attempt will use batter that is freshly made to determine any difference in the cooking process. The videos will be used to train and test the current computer vision program. A success definition is that the pancake is cooked well with a high quality taste at least 80% of the time. The program will be tested by checking to see if sends a signal when the pancake should be flipped against when the pancake was actually flipped in the video.

Pending Issues

- Complete Computer vision code
- Fix the arm
- Integrate all components

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Drew Caneff	➢ Fixed articulation 5/6 ➢ Aided in base construction ➢ Printed arm attachment ➢ Checked arm wiring	15	266
Amos Hunter	➢ Cut new base from plywood ➢ Fastened frame to base ➢ Prepared to mount camera	17	209
Brett Altena	➢ Arm movement testing ➢ Pancake image gathering	14	213
Kristian Wadolowski	➢ Arm movement testing ➢ Pancake image gathering	12	152
Jase Grant	➢ Worked on accelerating python pipeline ➢ Worked on python pipeline	6	127

Plans for Upcoming Reporting Period

Team Member	Plans
Drew Caneff	➢ Work on poster
Amos Hunter	➢ Mount camera ➢ Fasten arm to new base
Brett Altena	➢
Kristian Wadolowski	➢
Jase Grant	➢ Python research

	➢ Integrate camera

Gitlab Activity Summary

Action: joined, Tue Sep 04 2018
Author: dvcaneff
