Engineering Project Summary

The automatic object classification PLC system *9. 2014 – 1. 2015*

Objective: Created an automatic classifying system controlled by a programmable logic controller (PLC) to detect and sort different sizes of objects

- Designed the initial objects transportation route with SolidWorks.
- Programmed the executing ladder logic code for PLC to create a stander operation procedure.
- Fabricated the object classifying mechanism (Geneva wheel) for different size objects (BB shots/ping pong balls/marbles) to achieve the goal of sorting different sizes of objects.
- Combined the device and PLC with the computer for the preliminary test to check and fix the system issue from the coding and mechanism part.
- Technologies: PLC, Ladder Logic, Mechanical Design, Machine Shop, SolidWorks, Certified Pro-Engineer (Creo Parametric), Autodesk (AutoCAD, Navisworks), Trouble Shooting, CNC, Word, Excel.

Engineering innovation challenge *1. 2014 –9. 2014*

Objective: Designed and fabricated transportation for different objects and transferred the items with robotic arms

- Brainstormed and drew the preliminary concepts with Pro/Engineer (Creo Parametric).
- Calculated the volume and weight for different objects (tennis ball /golf ball /can/ aluminum cube/ ice cream stick) to gain the maximum load for the vehicle.
- Designed and fabricated the robot arms and loading structure for the target object, combined the transportation and robot arm.
- Built the wire connection between the vehicle and customized controller which has the function of controlling the speed and direction of the vehicle, also, with the ability to manipulate the arm to acquire target objects.
- Performed the system under multiple landforms for stability checking and simulated different circumstances to improve the efficiency of the car.
- Technologies: Certified Pro-Engineer (Creo Parametric), SolidWorks, Machine Shop, Dynamics, Robotics, Mechanical Design, CNC.

Self-guided path tracking vehicle competition *9. 2013 – 1. 2014*

Objective: Designed, manufactured, and assembled a fast and stable automobile with the feature that self-detected the racetrack without a controller

- Designed and built the structure of the vehicle based on the consideration of minimum weight.
- Plotted the proper electrical diagram on the breadboard to achieve maximum program fluency.

Utilized multiple optimization methods to determine and improve the performance of the vehicle.

- Technologies: Optical Sensors, Mechanical Design, Solderless Breadboard, LED, Arduino, CNC.