**Project Title:**

**Project Keyword: Robotics, Numerical Analysis, Optimization.**

**Project Appropriate for:**

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| --- | --- | --- | --- | --- | --- |
| **x** | **CAAM** | **x** | **ECE** | **x** | **MECH** |
| **x** | **CS** |  |  |  |  |

**Problem:**

To sort recyclables, conveyor belts transport the mix of recyclables collected, e.g, curbside, and workers and machines separate and sort the recyclables into different types that can be sold to metal and plastic recyclers and paper mills. This project aims to develop a robot that can be used near the end of the sorting process to pick up certain types of plastics from the conveyor belt and place them in designated bins. This project assumes that the plastic has been identified and its coordinates are provided to the robot. The team has to design a robot that picks up the plastic put into the bin, and repeats the process. Simulation or this robot, and optimization of its movement are used to evaluate how it fits into current sorting facilities. (How fast can the conveyor belt move? How many robots are needed for sorting given a conveyor belt speed and recycling volume?)

**Overall Goals:**

Identify a suitable robot. Develop a mathematical model for its motion. Develop mathematical software to simulate and visualize its motion. Develop a mathematical optimization problem to optimize the robot’s motion, and implement a solution algorithm.

**Project Mentors:**

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| **Rice University** | Matthias Heinkenschloss, Prof. CAAM | heinken@rice.edu |
| **Rice University** | James McLurkin, Prof. CS | jmclurkin@rice.edu |