Registration Form

TEAM INFORMATION

Team Name/Project Title: The Vortex

Department: Mechanical Engineering

Faculty Advisor: Peter Jenkins

Team Members: : Moana Sato, Augustus Hoel, Adam Niesen, William Padilla, Mary Lazanas, Ngoc Vo

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PROJECT INFORMATION

Description:

Using visual machine learning to control a manifold of pneumatic valves, the Vortex autonomously removes thin film from conveyors in recycling facilities.

Abstract:

In order to make a profit, recycling facilities struggle to increase the amount of material they accept while presenting a product that meets the expectations of their buyers. With increasing restrictions on quality, they are eager to find autonomous solutions in an industry unfit for human labor. Using sensors and sophisticated software, several companies are attempting to accept the challenge. Amongst those is the team sponsor: AMP Robotics. This company provides the “eyes and brain” to sort recyclables using visual machine learning technology. The Vortex uses the information AMP AI provides to recognize plastic film mixed into a pile of recyclables moving on a conveyor belt. Its control system engages pneumatic solenoids that activate an array of straight-through Venturi vacuums. Activation swiftly removes the targets and launches them into the air. A body for presentation and demo purposes was machined and put together with consideration to the reaction forces caused by the intermittent airflow. Analysis of fluid flow and experimental data helped design the inlet and outlet funnels to improve efficiency of the vacuums and decrease the number of clogs upon entry of materials. Experimentally collected pressures were compared and analyzed with the theoretical values derived from fluid analysis. The project will be handed over to AMP Robotics to complete and prepare for production in the next year.


fiber_paper_cardboard
s: 0.96
a: 410cm~2
fiber_paper
s: 1.00
a: 151cm~2
fiber_old_newspaper
s: 1.00
a: 533cm~2
thin_film
s: 0.74
a: 118cm~2
fiber_paper
s: 1.00
a: 447cm~2
fiber_paper
s: 0.98
a: 48cm~2
SPOT THE FAKE!