End of Line “Pass Through” Conveyor

Overview
At General Motors’ Pontiac Stamping Plant in Pontiac, Michigan, a shift to lightweight aluminum parts is causing trouble with robotic arm transferring between conveyor belts. Misalignments of the parts on a centering station prevent the robot from either picking up the part or dropping the part in motion. Parts that leave the press on the exit conveyor must be delivered to the end of line conveyor; processes can include preexisting GM systems or entirely new systems.

Objectives
Throughout the duration of the semester, the team will develop a solution to adjust for the part weight reduction and successfully transfer all parts from the exit conveyor to the end of line conveyor for manual inspection and stacking.

Approach
- The scope of the project, GM’s needs, and project constraints were delivered to the team through the sponsor.
- An initial concept generation period allowed the team to think about the problem and possible solutions.
- A visit to the Pontiac Stamping Plant gave firsthand experience of the stamping process and cleared any confusion about the problem.
- Concept screening lead to choosing a tray attachment for the robotic arms as the best idea generated.
- SolidWorks models and finite element analysis were used to test loading patterns, both static and dynamic.
- A 3D printed 1/10 scale model was made as a prototype.

Outcomes
- The press line will return to a target production rate of 300 parts per hour.
- A one-year return on investment deadline will be achieved.
- GM’s die change process is not altered or slowed in any way.
- A new type of robotic arm-tooling was created in the process.