Siemens Healthcare: DCA Line 2 Lid Pick and Place Robot Tooling

Overview
Siemens healthcare has a highly automated design for the manufacture of blood cartridges used for monitoring patients with diabetes. Due to the precision and reliability requirements, robotic assembly must be used. Currently, when the machines stop, the realignment can take as much as an hour.

Objectives
The team was tasked with creating a design that would reduce the downtime by 66% or more without actually interfering with the current production. Siemens only asked for a strong design that they would then build after the team had already completed their final semester.

Approach
- The concept specifications were provided in the original URS by Siemens
- The team regularly video-chatted as well as performed conference calls with Clint Stebbins
- The team created both CAD models of the design as well as rendered images of the design in action which incorporated the lasers into the design (seen in figure below)
- Most of the project consisted of the team creating a design and then either being told to scrap it or iterate it to meet the preferences of Siemens
- The actual concept generation phase included approximately 10 designs that were built in SolidWorks or else simply sketched before the team received confirmation that this would be the final design, at which point, the team attempted to incorporate it into the phase 3 robot as well
- After receiving confirmation for both robots, the team primarily focused on both improving the SolidWorks models and making slight alterations that Siemens suggested
- The team created a modelling prototype however the actual construction for use would be performed by Siemens
- The team was not required to perform any testing because that would need to take place in Indiana
- The current design is only presumed to be successful because of the easy-to-use fixture that would help aid in realignment process
- The team will graduate before the design is implemented which resulted in an in-depth testing procedure being drafted to reduce problems

Outcomes
- The downtime will be reduced by 66%, from 1 hour to less than 20 minutes
- Will result in 7500 more cartridges being produced