Dr. Robert Multari: The New Sheriff – Concussion Arrestor (Fall 2016)

Overview
In the last few years, research into the negative effects of concussions has revealed concerning details. Doctors are finding that serious concussions can have long-term health effects including permanent brain damage and premature death. Sports physicians are finding that these concussion symptoms are occurring in an alarming number of athletes, especially football players. Dr. Multari postulates that the cause of the most serious concussions is from major head displacement that damages the vertebral arteries in the neck. The Concussion Arrestor team will develop a sports safety equipment prototype that will prevent major head displacement and whiplash.

Objectives
The objective of this project is to create a prototype helmet that reduces concussions in football. The developed system will limit the “to-and-fro” motion of the head and neck.

Approach
- The team began by researching different sectors to develop a deeper understanding of the project.
- A list of customer needs and metrics were developed to test possible prototypes.
- A new concept was created through the concept selection process, integrating each team member’s ideas.
- This concept consists of two major parts: a retractor system and an interlocking system.
- Multiple SolidWorks CAD models were generated for the retractor until a final design was decided upon, which can be seen on the bottom right portion of this page.
- The interlocking device was created using different materials based off the team’s research.
- Preliminary testing was performed on the final prototype to whether it could withstand basic forces.

Outcomes
- This project provided the sponsor with a functioning prototype of a system that can limit the “to-and-fro” motion of the head and neck.
- Looking forward, having another group continue developing this prototype could ensure that a final product can be delivered.