Prosthetic Leg Fairing

Overview
The project sponsor’s brother, Peter Morrissette, recently lost his leg due to cancer, and has since been using a prosthetic leg. Peter does not like the look of his prosthetic, so the sponsor Perry tasked the students with creating a fairing or casing to cover his mechanical looking leg. The main challenge for the team was the fact that Peter lives far away, so the team could not use his prosthetic as reference.

Objectives
The project objective was to create a prosthetic fairing that was aesthetically pleasing to Peter and functions well without hindering his mobility. Kevin Nocom took the roles of project leader and contact person for the project, while Jing Zheng was the secretary and organizer. Daniel Slaughter was the project editor.

Approach
- Met with sponsors via teleconference to discuss objectives, requirements, and deliverables
- Met with Peter face to face to acquire measurements of the prosthetic as well as an understanding of how it works
- Created Solidworks model of prosthetic to use for future testing and reference
- 3D printed ½ scale model of prosthetic to ensure there would be no problems when printing a full scale model
- 3D printed the full scale model of the prosthetic
- A patent search was conducted to avoid copying any existing designs
- Generated 6 design concepts for possible ways to attach the fairing to the prosthetic
- Talked with Peter to decide on the design for attachment systems
- Generated 5 design concepts for the visible shell of the fairing
- Talked with Peter to decide on the design for the fairing shell
- Created Solidworks model of the fairing
- 3D printed the full scale fairing and made adjustments to fit the fairing with the prosthetic model

Outcomes
- Peter Morrissette will have a fairing to use with his current prosthetic
- The fairing will function properly as an aesthetic alternative and will not hinder Peter’s continued recovery
- The designed attachment system is a new idea that the sponsor may move forward with from a business perspective