TEAM 5: TEC-PRO

https://amanwithaphd.wordpress.com/2014/12/28/cool-looking-prosthetics-3d-printed/
http://www.bostonmagazine.com/health/article/2013/11/26/prosthetics-research-boston-
ankle-prosthetic/
http://www.treehugger.com/clean-technology/bike-design-for-amputees-wins-james-dyson-
award.html
THE PROBLEM

• Skin Breakdown

• Loss of Function

• Current Solutions
  • Antiperspirants
  • Botox


Figure 1. Michael Jordan sweating[1]
CONTEXT

• **Nearly 2 million amputees in the U.S.** [1].
  • **Below-knee amputees being the most common** [2].
• **One potential competitor releasing a similar product in 2016 - Aquilonix** [3]
• **In line with the cost of a car** [4]
  • **Customization**
  • **Short life**


Figure 2. Leto solutions’ Aquilonix cooled prosthetic [3]
CUSTOMER

FIRST GOAL:

• PRIMARY CUSTOMER IS STEPHEN LANDER AND THEN ANY ADULT TRANSTIBIAL (BELLOW THE KNEE) AMPUTEE

SECONDARY GOAL:

• MAKE THE DESIGN ADAPTABLE TO ABOVE-THE-KNEE AMPUTEES

CHRISTIAN FAITH - DESIGN NORMS

- **Caring**
  - Provide comfort to user
  - Lightweight to minimize energy expenditure
- **Trust**
  - Trustworthy, dependable, reliable
- **Integrity**
  - Pleasing and intuitive
  - Function as before

http://photodiarist.com/2011/03/
PROJECT STATUS

- Design Alternatives
  - Thermoelectrics
  - Evaporative Cooling
  - Stored Liquid Nitrogen
  - Refrigeration Cycle

- Thermal Model for Evaluation

- Current Top Option - Thermoelectrics
  - Simple, convenient, lightweight, reliable

- Obstacles - Weight/Power Balance
QUESTIONS?