

Project I Description

Project Name: Snow-Gear for Paralyzed Athletes

Sponsor: Phoenix Industries – LAU – Michael Haddad

Team Size: 4 MEE Students

Project Overview

Michael Haddad is a T4-T5 paralyzed athlete who is planning to hike for couple days reaching the 0° North Pole point. This accomplishment will be the first of its kind for a paralyzed person and will give hope for similar cases to perform athletic endeavors. The goal of the project is to design a snow gear that supports this activity. The gear will be composed of a pair of lightweight and durable snow-crutches that can carry Michael's weight over different types of snow (powdery, icy, etc...). The second piece is something to wear in his feet and drag himself. This could be a snowshoe, a ski, or a snow rover (similar to one designed at LAU last year). All the gear need to be optimized for weight, extreme cold resistance, and durability. A series of sensors shall be designed an installed on Michael to detect his performance while testing this gear.

Project Areas and Majors needed

Kinematics/CAE (2 MEE Student)	Stress analysis/ Manufacturing (1 student)	Instrumentation (1 student)
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Project Deliverables

Design and Build the following component of the Snow Gear:

- Design and manufacture lightweight pair of crutches for powdery snow and icy snow. (Investigate using Aluminum or Carbon Fiber.)
- Design and manufacture lightweight snowshoes that reduces Michael's drag
- Design and manufacture a snow rover that allows Michael only to drag himself forward with minimal friction. The rover should not be able to move backward and has a break to slowdown forward movement when desired
- Design an instrumentation system that characterize the performance of Michael
- Test the systems on Michael and estimate the energy spent per meter of motion

