ORTHOTIC DEVICE PRELIMINARY DESIGN PROJECT

Project Sponsor / Client: Dr. Lorri Riley

Client Contact Information:
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Project Term: Fall 2013 – Spring 2014

SDSM&T Project Program: Industrial Engineering & Engineering Management

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Project Overview:

J1 Insoles has a design concept for a line of orthotic devices to treat Ankle Foot Orthosis (AFO). AFO is common among people with Down’s Syndrome, and as children develop into adults with AFO, the structure of the ankle-foot connection tends to deviate inward and frequently collapses. Dr. Riley has applied for an SBIR Phase 1 grant, but needs some preliminary product design, verification experiment design and strategic planning help to support the grant if it is funded.

Dr. Piper and the IE Department will be purchasing new, computer-based sensors, and a 3-D scanner for gathering human engineering data and two 3-D printers that may help support the device development effort.

For the IE Senior Design portion of the project, the following are required:

- An analysis of potential materials to construct the device from;
- Researching the orthopedic/anthropometric data to find appropriate device dimensions;
- Preliminary CAD modeling of some potential device designs, fabrication, and test fixtures;
- Prototyping of device and test fixturing using 3-D printing technologies.
- Preliminary design and testing of procedures and equipment for assessing effectiveness of the device.
- Design and analysis of business modeling, materials, equipment, labor and other costs to develop the device further.