

iMULTI2: Heeluxe Fit Tester

Heeluxe is a world leader in footwear testing and is located within a mile of campus. Dr. Geoff Grey, the CEO and founder is an outstanding person to work with and has been a great mentor for previous ME projects. His prior work with students yielded a traction tester (Heeluxe Trax) that is currently in operation, testing shoes for all the big brands.

The Fit Tester

Shoe manufacturers need to understand the fit of their shoes for a variety of foot shapes and it will be ideal to understand the fit quickly as shoes come off the manufacturing floor. This project seeks to develop a fit tester device that will be easily inserted into shoes to test up to 16 points for fit within the shoe. The fit tester will look approximately like and model a foot, and will include an array of sensors to check fit. The fit tester device should conform to the following functional specifications:

- Measure the pressure between the device and the shoe at 16 locations
- Measure the separation between the “toe” of the fit tester and the front of the shoe
- Report pass/fail immediately based on the feeling of each sensor
- Output sensor data to a custom app for easy visualization
- Log pressure data
- Sensors must last 3 years or be able to be replaced easily

We expect the students to choose sensors that will be appropriate for the application. Heeluxe has tried both force sensitive resistors (inexpensive but short lasting) and capacitive force sensors (more expensive but large). It is left up to the team to choose the sensors that make the most sense inside of the shoe. The project will involve integration and characterization of the sensors onto a customized shoe insert, data collection/processing/analysis, and design of an intuitive UI that displays the sensor output and determines whether the shoe meets the specs for proper fit.

This project is open to 4-5 ECE students.