

**Microcontroller/Environmental Sustainability Project**  
**Safety Harness Alert System**

**Mission Statement**

To design and build a functional microcontroller prototype of a Safety Harness Alert System (SHAS) to alert workers in the event of a fellow worker falling.

**Synopsis**

The SHAS project began in 2012 when students at the University of New Haven built a proof of concept circuit board design.

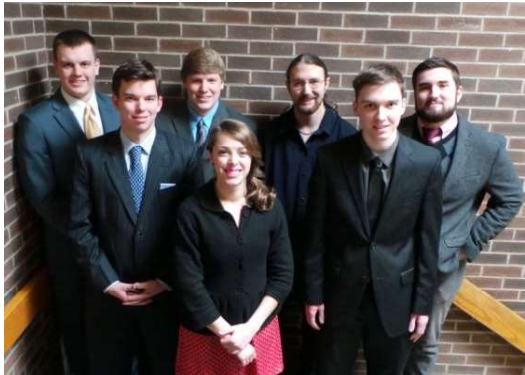
The 2014 SHAS team started the project by deciding to use an open source microcontroller Integrated Development System (IDS) called Arduino from Ivera, Italy. The Arduino uses the low cost Atmel ATmega328 chip.

Writing programs to control the Arduino proved to be the most time consuming and difficult part of the project. The next critical step was to get multiple SHAS units to communicate with each other. The team selected an XBee radio frequency chip for this task. Coding this chip to communicate with the Arduino board and with each other also proved to be challenging

The final, and more manageable, challenge was designing a housing for the electrical components. The team completed two designs using a Computer Aided Design software package called SolidWorks. The designs were then manufactured using 3D Printing technology.

In addition to completing the prototype, the team was also able to realize some of their secondary goals. The team was able to determine a target market. The team also found that there are no other products on the market that competed with the SHAS. The team also learned about the different state and federal laws governing worksite safety and equipment. There was some incredibly useful information regarding the correct response time to accidents. However, the team found that there were no specific laws applicable to the SHAS. There are no specific laws because there is simply nothing like the SHAS currently on the market.

A Phase II of this project is anticipated in 2015.



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