

Distance-Sensing Doug

Final Project for Circuiteering Club

December 2009, Olin Year 1

In the Circuiteering club, I learned about microcontrollers, sensors, and basic engineering tools used to build an intelligent creature. I spent 1 month before the bi-annual Expo working on our very first **robot**.

Aim: a smart creature that can **avoid obstacles** and move away from them.

Solution: Using an infrared distance sensor mounted to the front of our robot, Doug, and a **PIC microcontroller** programmed in **C-language** to sense distances of a few centimeters away. When this distance came between Doug and any obstacle, Doug was commanded to stop, ‘turn right by 90°’ and accelerate away from the obstacle.

Design: An assembled mechanical ‘machine’. The distance sensor was mounted to the head of Doug and connected to an input of the PIC. The microcontroller made use of **Pulse Width Modulation** to control the DC motors in the wheels of Doug via the use of **H-bridges** in between. The PWM supplied a signal to the H-Bridge-and-motor circuit (via a D/A convertor) so that speed and motor direction could be controlled.

