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ECE 3710 Final Project Proposal

For the final project we would like to build a prototype for an electric unicycle. An electric unicycle works on the same principles as a Segway but with only one wheel. When it senses that it is falling forward it moves the wheel in that direction to prevent the fall and vice versa for the other direction, unlike a Segway, lateral balancing is the responsibility of the rider, so the prototype will have two wheels to compensate for this.

The frame of the prototype will be constructed from an erector set. An Invensense MPU-6050 will be used for the accelerometer/gyroscope sensor. This will be interfaced with the microcontroller via the IIC bus. A brushless motor controller that has been flashed with new firmware to control brushed motors will be used to control the motor. This will be interfaced with the microcontroller via PWM.

We will be using what is known as fuzzy logic for the control algorithm. Basically when it senses that it is off balance it will tell the motor to go at a certain speed to compensate, the farther off of straight up the faster the motor will go.