Purpose

The purpose of this project is to update the current curriculum for ECE 4760 at Cornell. The current teaching tool is a well-made microcontroller, but it lacks the advanced features that students need to be competitive as soon as they graduate. This project aims to implement a brand new, state-of-the-art microcontroller family ripe with features for the 21st century.

Strategy

Gather a list of features:
- SPI (25 Mbps)
- I2C (1 Mbaud)
- 10-bit ADC (1.1Msps)
- Capacitive Touch Sensing
- UART (12.5 Mbps)
- Hardware DMA (Direct Memory Access)
- Full Speed USB 2.0 OTG (12 Mbps)
- Real-Time Clock and Calendar
- Peripheral Pin Select
- Parallel Master Port
- 10/100 Base-T Ethernet

Explore, research, and implement examples using some (or all) of these features

Create circuit boards to make these features easy to use in a condensed time frame

Results

Developed three circuit boards that make advanced features easy
- Main circuit board with port expander and USB OTG
- Basic I/O Board
- Ethernet Interface Board

Developed easy-to-use APIs, making Ethernet and USB simple to use

Provided clear, condensed documentation to accommodate the rapid learning curve required for an academic setting