Course: ME 549 – Microcontroller Interfacing (Bradley University)

Project: Play Day I

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Desc: Class was canceled today, so we were asked to practice working with microcontrollers during the usual class period.

Objective: Start laying out potential course project and begin research.

Introduction:

While I have worked with the Arduino microcontroller extensively in the past, I have not had the opportunity to write custom sensor drivers/libraries in C++ or to program the Arduino microcontroller in ATMEL Studio. While these techniques make the Arduino a more powerful platform, work projects typically present the time constraints that prevent experimentation. Learning ATMEL Studio is not a good plan when the device *has to* work *today*.

I consider these two topics professional skills that I would like to develop during the course.

Potential Course Project:

Milestones:

In order to develop these skills, I plan on working towards the following milestones.

(1) Read a flow cell using an Arduino microcontroller.
(2) Write a function encapsulating the code to manage the flow cell in the background.
(3) Write a real, Arduino library for the flow cell in a separate file.
(4) Write an Arduino library for a serial device (e.g. electronic balance, linear photodiode array).
(5) Write a driver for a serial peripheral interface (SPI) device.
(6) Write a driver for an I2C device.
(7) Port the code from STEP (1) into ATMEL Studio.
(8) Write a driver for the flow cell as a separate library in ATMEL Studio.

Grading Criteria:

In order to evaluate my progress on the milestones above, I propose the following grading criteria/categories.

(1) Milestone completion
(2) Project documentation (e.g. reports, tutorials, and code commenting)

(3) Adherence to published code style guidelines
(4) Use of Git tracking/Maintenance of public GitHub page for drivers

Course Guest Lecture:

During the course, we are required to give an hour-long lecture on a topic of our choosing. Based on the timing of this lecture in the semester, I am planning on talking about “SPI Interfacing.” I am planning on the lecture lining up with my completion of MILESTONE 5, writing a driver for an SPI device.