Title: Electronics and Controls on a Formula SAE vehicle
Students: ECE, ECE, ME, ME
Topics: PCB Design, PC Application Programming, Communication Protocols, Microcontroller Coding

Description
The 2009 OSU Formula SAE car will be built by an international collaboration with the German university BA Ravensburg and will be significantly different from previous designs. The new SAE Formula car will be primarily constructed from a carbon fiber composite material and a lightweight, single cylinder engine will be used.

The electronics team would be responsible for researching, designing and implementing a CAN based steering wheel display and/or controller. The system would require CAN based communication with a Motec ECU (engine control unit) and data acquisition system for data input. The system must be completely modular and the car must operate flawlessly without any of the designed components for redundancy. Depending in the size and ambition of the electronics team the scope of the project may be adjusted to incorporate more elaborate displays options and control options. For example, as simple display could be a series of LED lights. A more elaborate display would be a touch sensitive color LCD display with multiple data display screens, user intuitive graphics, and ability to control ECU options and functions. Another option would be to explore data collection with the same controller and CAN signal transmission to the Motec data logger. The electronics team would work closely with the electronics team at the BA who has already successfully made a CAN based steering wheel display. The primary goals of the project would be to successfully collaborate with the BA, acquire and document their knowledge and expertise, and provide successful, programmable CAN communication with the Motec system.

Absolute Minimum Requirements
- Properly communicate to Motec ECU
- Have all other electronics on SAE car still work properly with the removal of power to the display and the physical removal of display from the car
- Display 4 critical measurements from SAE car
- Must weigh under 500g, use less than 10W of power
- Have control of 3 ECU functions

Desired Features
- Touch-sensitive LCD display
- Multi-page, intuitive information pages
- Able to control ECU functions