**Project title:** Enhanced Animal Simulator - Video debriefing software

Researchers at the Cornell Veterinary School, under the direction of Dr. Daniel Fletcher, have developed a physical simulator to model canine patients. The open-source simulator architecture includes manager software written in C++ running on a Linux PC, a user interface and simulator patient monitor written using Javascript and HTML 5, and a hardware interface based on a Beaglebone Black microcontroller and several custom PCBs. This animal simulator is used in clinical classes for training veterinary students as well as veterinary technicians and veterinarians. Although the current system has a wide range of functions, including palpable pulses, chest movements, and heart and lung sounds, additional functions would enhance the student experience. The system currently uses a rudimentary video recording system based on Open Broadcaster software to collect video from webcams and a simulated patient monitor during simulations. This video is then synchronized with a log that allows the facilitator to play specific parts of video during the post-scenario debriefing session to identify specific actions taken by the team that warrant discussion. A more robust video collection system would improve the teaching quality of the system.

**Specific MEng Contributions:**
The current system is in use at the Vet School and the project team must first study the system to learn how to integrate any new functions. Steps in the project process would include:

- Understanding the technology of the current simulation system
- Work with vet school researchers to understand the functionality needed from the video recording and playback system
- Explore and select necessary hardware and software to implement the video debrief system
- Record at least 2 video streams and the simulated patient monitor and synchronize that data with the log file from the simulation.
- Design a prototype for testing with the current simulation system
- Integrate the software into the current system

The goal of the project will be to provide the enhanced function within the simulator by the end of the MEng project. This includes documentation for all design elements and an operation/maintenance guide for researchers at the Vet school.

- The team will work closely with researchers at the Vet school.
- The team must take direction from the Vet school researchers as requirements evolve.
  - Periodic meeting with Vet school colleagues will include updates and demos. Working prototype will be delivered according to the established schedule

**ECE Field Advisor Name:** Joseph Skovira

- Email – jfs9@cornell.edu
- Phone – 607 255 6633
- Office – 211 Phillips Hall

**Outside Field Advisor Name (if applicable):** Dan Fletcher

- Email – djf42@cornell.edu
- Phone – 607-253-4090
Office – 318 Clinical Programs Center

Number of MEng students needed: 2

Related web sites: https://vetsim.org,
These videos contain information about our first generation simulator based on a human patient simulator:
  • https://www.youtube.com/watch?v=1vM71GW_8MA

Required Skills:
Microcontroller programming and system design, sensor development and interfacing, network communication, system integration skills, GUI and web site design

Estimated Project Time Frame: Fall 2017 + Spring 2018 semesters