**MEng Design Project Announcement – 2018**

**Project title:** Convert Spike Hound from Matlab to Python

**Brief Description of Design Project Goals:**

**Overview:** Spike Hound is a data acquisition, Stimulus Generation, Instrument Control, and real time analysis package designed for use in physiology research and education where continuous multi-channel data is acquired and discrete events are analyzed. The software allows for connection to a broad range of popular data acquisition hardware from high end, calibrated data acquisition boards to the sound card in your computer. Spike Hound allows for signal visualization, real-time filter applications, audio output to a monitor, and data logging with associated meta-data.

**Specific MEng Contribution:**

**Desired Features**
- Software Oscilloscope with Multi-Channel Support, Trigger Modes, and Data Logging
- Supports analog inputs including Windows Sound Card Inputs, and National Instruments ADC/DAC
- Output any channel (including filtered channels) to your computer speakers for audio monitoring
- Generate pulse trains or arbitrary waveforms (e.g. sine, triangle)
- Digital I/O Support
- Live band-pass and 60Hz notch filtering
- Threshold w/ window based event detection
- Real time analysis result visualizations
- Analytics: Time, Max/Min, Interval/Rate, Peak Frequency Content, Energy Density
- Cross channel correlation (event triggered averaging)
- Text based metadata logging

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- **Client** Bruce Johnson, Email - brj1 @cornell.edu, Neurobiology

**Number of MEng Students Needed:** 2

**Required Skills:** Familiarity with Matlab and Python graphics programming. Ability to work with staff to make a useful product.

**Estimated Project Time Frame:** Two semesters.