INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

Project Title:	*Handheld electrochemical impedance spectroscopy sensing unit*
Project Short description	The project consists on the development of a portable platform that allows the acquisition of an electrochemical signal from an electrochemical cell-on-a-chip, with the condition of compactness and multi-detection. This handheld device will do the reading of a biosensor designed and fabricated at INL. The student will evaluate/simulate hardware architectures targeting multisensor/multichannel options as opposed to the single sensor/channel commercial platforms. The design of the hardware will be based on standard components though requiring optimization for a reasonable handheld size of sensing unit. The system will include an acquisition channel (A/D converter), amplifiers, filtering, some data/signal processing and USB host communication (this may require microcontroller firmware development). In addition to the hardware design, an host application software is also required for further data visualization (GUI) and data transfer from handheld device to host. C/C++, Matlab or Labview may be required for such development. Finally, a fully assembled system will be tested and validated with application specific biosensor designed and fabricated at INL.
Expected Start/end date	Sep 1st, 2014 – July 30th 2015
Required degree and Background knowledge of students, minimum gradepoint average, etc…	Students applying to this project should preferably have a background on Electrical/Electronics Engineering and be knowledgeable in: - Board level design (PCB design) - Mixed-mode and Spice simulation (LT Spice, HSpice, Spectre or other Spice simulation) - Microcontroller development (Microchip PIC or any ARM core) - Software skills in C/C++, Labview or Matlab Nice to have skills - Some experience in FPGA design (either in VHDL or Verilog) including synthesis tools like Synopsys Symplify or Xilinx ISE.

Supervisor at INL

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