



<b><i>Project Title:</i></b>	<i>High-Speed, Multiple Channel Lab-on-Chip Acquisition Hardware for Magneto-resistive biochip applications</i>
<b><i>Project Short description</i></b>	<p>The project consists on the development of a hardware platform capable of acquiring multiple biochip sensor channels with high resolution and high transfer rate between Host and hardware.</p> <p>The project specification is divided in two sections. The main goal is related to the design of a Host PC/acquisition hardware bridge capable of simultaneous data transfer of at least 32x 16-bit@500 kHz channels. It requires the design of an embedded microcontroller based-system supporting FIFO memory and real-time data transfer to Host PC. This module will collect data from existing acquisition card already.</p> <p>The second part of this project requires the development of communication firmware and the development of a Host PC generic application (API) that can interface to Labview or Matlab applications.</p> <p>Finally, a fully assembled system will be tested and validated with application specific biochips designed and fabricated at INL.</p>
<b><i>Expected Start/end date</i></b>	Sep 1 <sup>st</sup> , 2014 – July 30 <sup>th</sup> 2015
<b><i>Required degree and Background knowledge of students, minimum gradepoint average, etc...</i></b>	<p>Students applying to this project should preferably have a background on Electrical/Electronics Engineering and be knowledgeable in:</p> <ul style="list-style-type: none"> <li>- Board level design (PCB design)</li> <li>- Mixed-mode and Spice simulation (LT Spice, HSpice, Spectre or other Spice simulator)</li> <li>- Microcontroller development (Microchip PIC or any ARM core)</li> <li>- Software skills in C/C++, Labview or Matlab</li> </ul> <p>Nice to have skills</p> <ul style="list-style-type: none"> <li>- Some experience in FPGA design (either in using VHDL or Verilog) including synthesis tools like Synopsys Synplify or Xilinx ISE.</li> </ul>

### Supervisor at INL

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