**Using Python to Automate Electron Transport Experiments and Provide Real-Time Data Visualization**[1] RYAN RENO, CLAUDIA OJEDA-ARISTIZABAL, Cal State Univ- Long Beach — Low temperature electron transport experiments on low dimensional nanomaterials are ruled by exciting quantum effects. In order to extract meaningful information from these experiments, data needs to be collected in a reliable way. Real time visualization of the data allows us to determine efficiently the direction of the experiment. Here we present a method using the Python programming language and open source libraries to control measurement instruments such as Keithley source-meters and lock-in amplifiers while simultaneously controlling a closed-cycle cryostat with a superconducting magnet. We present additionally the implementation of a library which provides a web-based interface to interactively visualize incoming data from multiple sensors in real time. Using these tools, we have been able to fully automate data acquisition during initial tests conducted on our newly installed cryostat. These tests include the reading of temperature in separate regions inside the cryostat during cooldown and the reading and control of current supplied to the superconducting magnet through different runs to full field, 12 Tesla.

Ryan Reno
Cal State Univ- Long Beach

Date submitted: 27 Sep 2017

Electronic form version 1.4