**LabVIEW 101 – Weeks 8, 9**

Before class:

1. Download updates from <https://github.com/rizett/LabVIEW-101>

Required equipment:

Computer with LV and NI-MAX installed

3x Fans

3x DC power supplies

3x DC relays

3x Thermocouples

1x Paddlewheel

1x Solenoid valve

1x Optics valve

Topics:

Sending and acquiring analog signals via the NI-DAQ

* Week 8: Using the NI-DAQ to control power output to a device (e.g. fan, pump, valve)
* Week 9: Using the NI-DAQ to read voltage from a device (e.g. thermocouple, paddlewheel)

Think about your projects!

**Week 8: Sending signals via the NI-DAQ**

1. Using NI-Max:
   1. Wire output from NI-DAQ to Relay
   2. Draw a diagram!
   3. Use NI-MAX to control the Relay: select device > test panels > analog output
   4. Wire in a fan
2. Repeat using LabVIEW
   1. Setting up NI-DAQ VI: Block diagram > Measurement I/O > NI-DAQmx > DAQ Assistant
   2. Input information
      1. Data (0 or 5 V): merge signals if controlling 2 channels
      2. Device name (IO control on front panel > I/O > DAQmx Name Controls > DAQmx Device Name)
   3. Create a simple VI: test with fan
   4. Create a new VI to control the optics valve position

Exercise:

With a partner: create a **subVI** to control when to turn a device on / off. Use either a fan or valve.

Allow the device to be controlled manually (i.e. using a user-defined Boolean switch) AND automatically (i.e. when a signal exceeds or falls below a certain threshold). Use a case structure to separate these two sets of actions and a front panel control to select which “mode” to use. In the automatic mode, enable a manual over-ride so that the device can be turned off by a user, or when the threshold is exceeded (requires an OR statement somewhere…).

Include a Boolean LED indicator to show when the device is on.

Think about appropriate terminals to wire in / out of the subVI so that it can be integrated into a larger VI program, and used generically to control different devices.

Save to the LabVIEW 101 library.

**Week 9: Acquiring signals with NI-DAQ**