Simulink Configuration Information

You will frequently use the MATLAB Simulink graphical programming environment for system modeling and control. The following settings should be configured when creating a new Simulink file, in order to ensure that your simulations run properly:

Settings under "Simulation" (top menu bar of a new Simulink file window)

- Go to "Simulation" → "Model Configuration Parameters"
- Select: "Solver" in the left-hand menu column.
  - Set "Solver Options" → "Type" to **Variable-step**
  - Set "Additional Options" → "Max Step Size" to a value that is approximately $T_{Simulation}$**/10,000** (with $T_{Simulation}$ = length in seconds of the simulation), to ensure sufficient resolution of simulation data. In Lab 1, select a value of **1e-6**. In Labs 3 / 4 / 6, a value of **2e-3** is sufficient.
  - "Apply" these changes.
- Select: "Data Input/Export" in the left-hand menu column.
  - Set "Save to workspace" → "Format" to **Array**
  - Uncheck "Save to workspace" → "Limit data points to last:" (to allow Simulink to record as many data points as necessary)
  - "Apply" these changes.

Settings under "File" (top menu bar of a new Simulink file window)

- Go to "File" → "Simulink Preferences"
- Select: "Configuration Defaults" → "Solver" (left-hand column). Apply the same settings as above.
- Select: "Configuration Defaults" → "Data Input/Export" (left-hand column). Apply the same settings as above.

Note: When using the Quanser Hardware Blocks ("HIL Initialize" / "HIL Read Encoder" / "HIL Write Analog") and connecting to Quanser hardware via Simulink, also do the following items:

- Create a new Simulink file on the Quanser-connected lab computer, and copy / paste any block diagrams you developed on a personal computer into this new file. **Simulink files created on non-lab computers will never compile to Quanser hardware correctly!**
- Set "Simulation" → "Mode" → "External"
- Set "Code" → "External Mode Control Panel" → "Signal & Triggering" (under "Configuration"). Then click to select all signals and set "Duration" (under "Trigger Options") to **1e6**. (This prevents data clipping at 2 seconds, since Quanser hardware provides values every 2 ms.)