Summary of Contributions

A list of all modifications made to ODrive v0.5.1. All edits are labeled with an "ERG" comment, so edits may easily be viewed in the code [13] by searching "ERG".

Firmware: Input commands and data collection

I. Test input
   a. axis.cpp and axis.hpp
      i. Added input configuration to Axis class
         1. Added struct definition InputConfig_t
         2. Added input_config argument (of type InputConfig_t) to Axis class
         3. Add input_config_ field (of type InputConfig_t)
      ii. Added new state machine behavior to run test input
         1. Edited run_state_machine_loop() to include behavior for AXIS_STATE_MOTOR_CHARACTERIZE_INPUT
         2. Added method run_motor_characterize_input() (120 lines)
   b. main.cpp
      i. Added array input_configs
      ii. Added input_configs to save_configuration() and load_configuration()
      iii. Added input_config argument to axes initialization
II. Data recording and user-accessibility
   a. odrive_main.h
      i. Added ring buffer motor_characterize_data, of size MOTORCHARACTERIZEDATA_SIZE, with index tracker motor_characterize_data_pos
      ii. Added six get_motor_characterize_data_XXX() functions for buffer size, "latest observation" index, and by-index timestep, voltage, position, and velocity
   b. communication.cpp
      i. Added initialization for ring buffer
   c. odrive-interface.yaml
      i. Added new AxisState MotorCharacterizeInput
      ii. Added enum InputType
      iii. Added input_config
      iv. Added the six get functions
   d. axis.cpp and axis.hpp
      i. Added method record_motor_characterize_data() (8 lines), which writes data to motor_characterize_data at index motor_character_data_pos when called as part of run_motor_characterize_input()

Python: User interface, data retrieval and export

I. enums.py - added AXIS_STATE_MOTOR_CHARACTERIZE_INPUT
II. utils.py - added method run_motor_characterize_input() (88 lines)
III. shell.py - added run_motor_characterize_input() to launch_shell()