Motorized Faders

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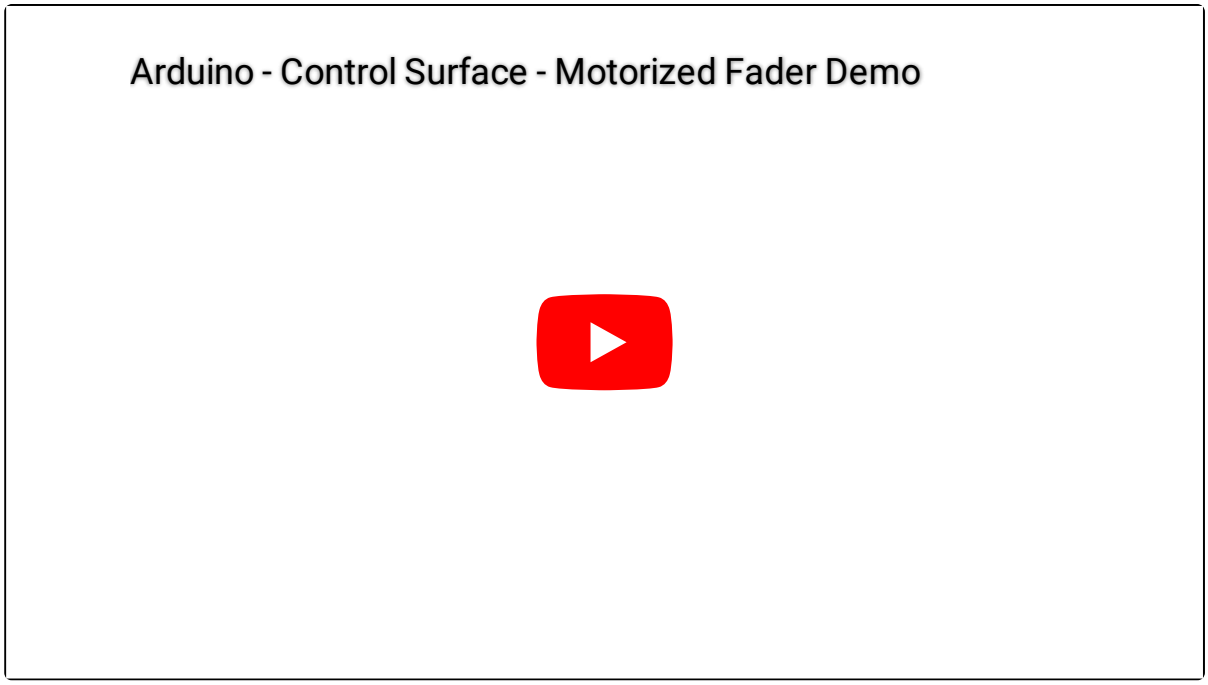
Implementation of PID controllers to drive motorized faders in a DIY MIDI Control Surface.

Code on GitHub: tttapa/Control-Surface-Motor-Fader



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1. PID Controllers

Theory and discretization of a PID controller.

2. C++ Implementation

PID controller implementation in C++.

3. PID Tuning

Tuning of the PID controllers.

4. Architecture and Design Decisions

Overview of how the code is structured.

5. Hardware

Components and hardware.

6. Configuration options and common use cases

Settings to use for some common use cases, such as outputting MIDI directly, tuning the controllers, changing the setpoint of the controllers over I²C, etc.

7. ATmega328P Code

Complete C++ implementation for driving up to four motorized faders on an ATmega328P microcontroller, with all kinds of extra features such as capacitive touch sensing for the fader knobs, tuning over the serial port, setpoint changes over I²C, and

so on.