CS 5780 Final Project
YRok Balance Bot

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Project overview

- Reverse pendulum robot
- Custom microcontroller PCB and encoder PCBs for the DAGU yellow gear motors
- IMU provides accelerometer and gyroscope data over I2C
- Using a PID control loop we stabilize the robot’s balance

Objectives

- PCB Design (done)
- Solder board/make stencil for surface mount ICs (done)
- Simple board tests (done)
- Design chassis (done)
- Communicate with IMU (done)
- Serial communication (done)
- Correctly control motors (done)
- Construct chassis (done)
- Design algorithm to keep balance (done)
- Tune algorithm (done)
- Improve system reliability (in progress)

Technicalities

- Custom board
- Raspberry Pi programming
- Chassis
- IMU interfacing
- Motor/encoder interfacing
- Complementary filter
- PID tuning

Technicalities