

Group 5

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Balance beam toy

Goal:

The goal of our project is to demonstrate feedback control of a motor in a balancing application.

Description:

The toy will be a balance beam with a fixed pivot that touches the ground. The beam will be movable in one dimension relative to the pivot. To actuate the movement, either a servomotor or a stepper motor will drive a leadscrew that threads through a nut attached to the pivot. An inclinometer attached to the beam senses the angle of the beam. Objects or weights can be placed on both ends of the beam, and the microcontroller will adjust the leadscrew such that the beam stays level. Such a toy might make an interesting curio to have on one's desk!

Hardware Components Needed:

- MSP430 launchpad
- ADIS16203 inclinometer
- leadscrew and nut
- motor (servo or stepper)
- Motor driver
- Battery
- chassis/body
- beam

Useful MSP430 features:

- Timers for PWM output to motor
- SPI interface to read inclinometer