

Assisted-Balance Bicycle

A universal addition to bicycles to help assist
a rider with balancing

Cycle 2



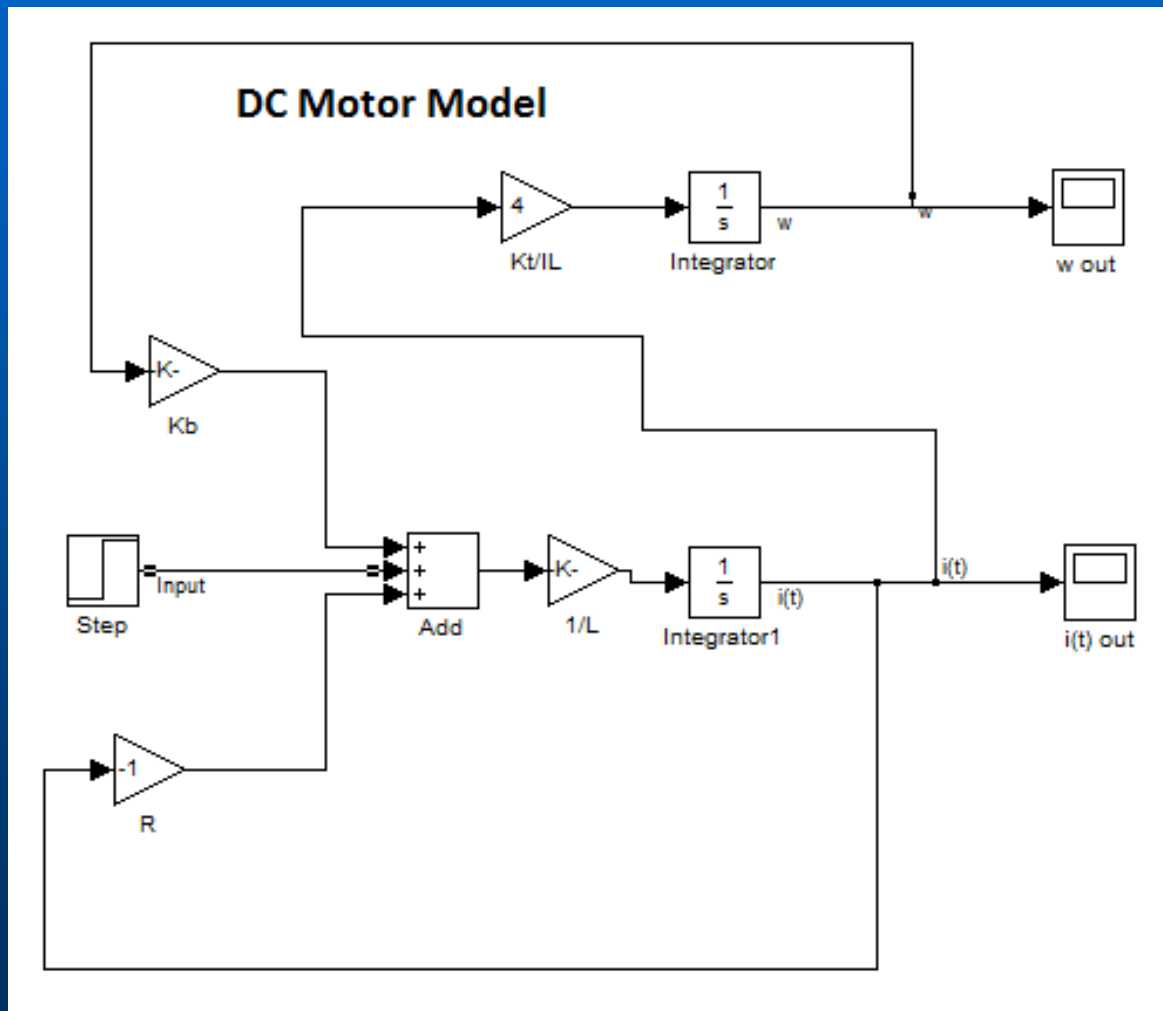
Dynamic equations

- Torque equation $T = M \cdot R^2 \cdot \alpha$
- Due to coupled forces the torque of the bicycle and the torque of the flywheel can be set equal to each other:

$$M_b \times R_b^2 \times \alpha_b = M_f \times R_f^2 \times \alpha_f$$

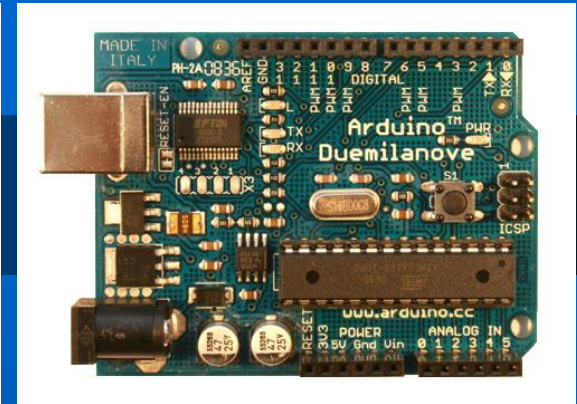
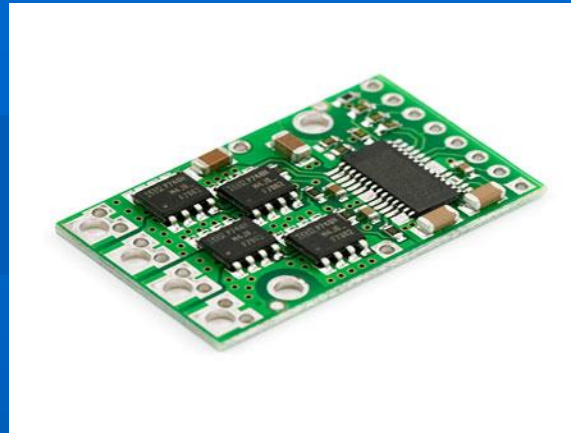


Control System



Hardware

- Hardware List

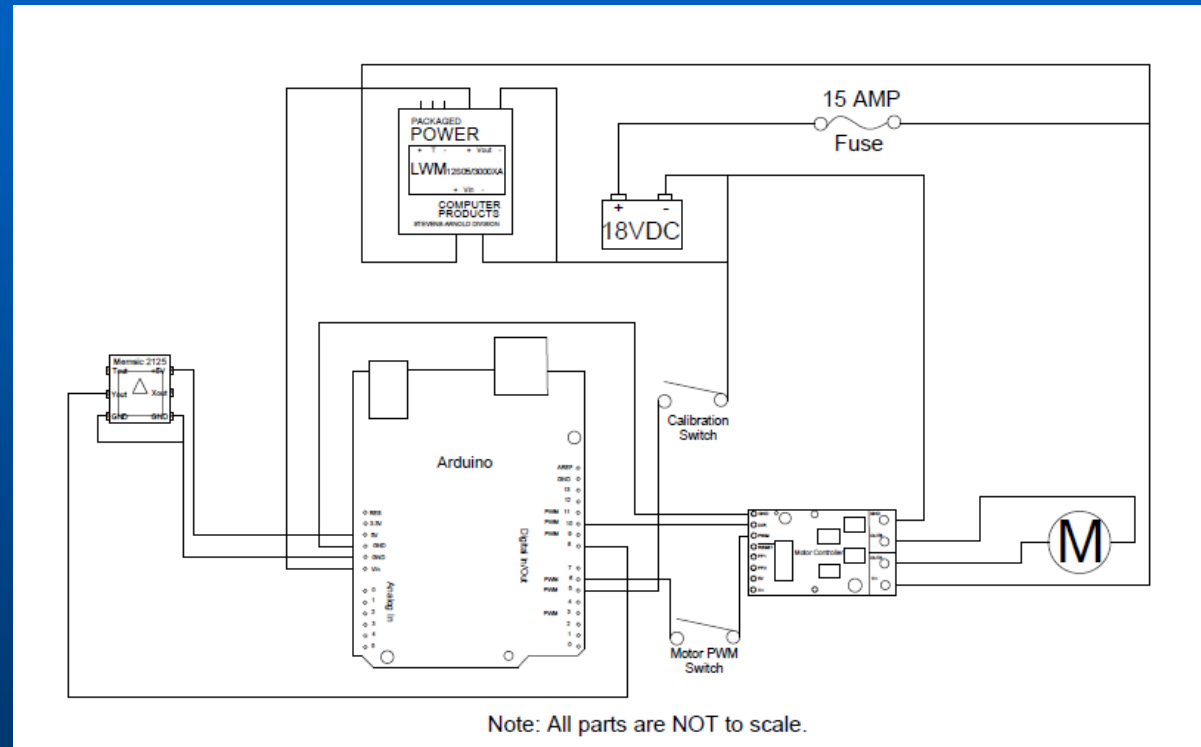


- Arduino Duemilanove Microcontroller
- Memsic 2125 Dual Axis Accelerometer
- Bosch Batteries/Charger
- EC Corp Motor
- Bike
- Mounting Hardware
- Flywheel
- Motor Controller

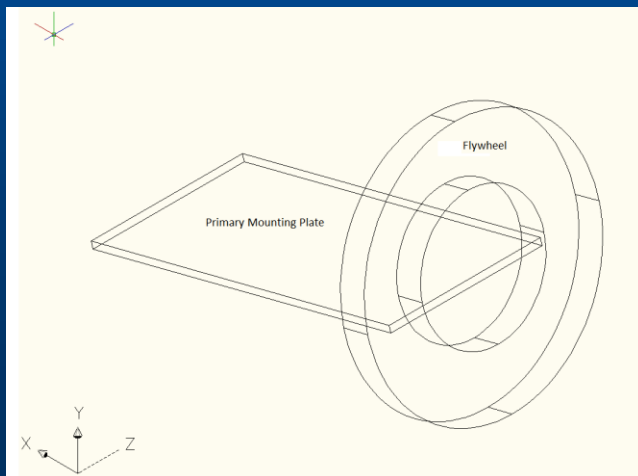


Hardware CAD

Electrical Schematic



3D Plate Design

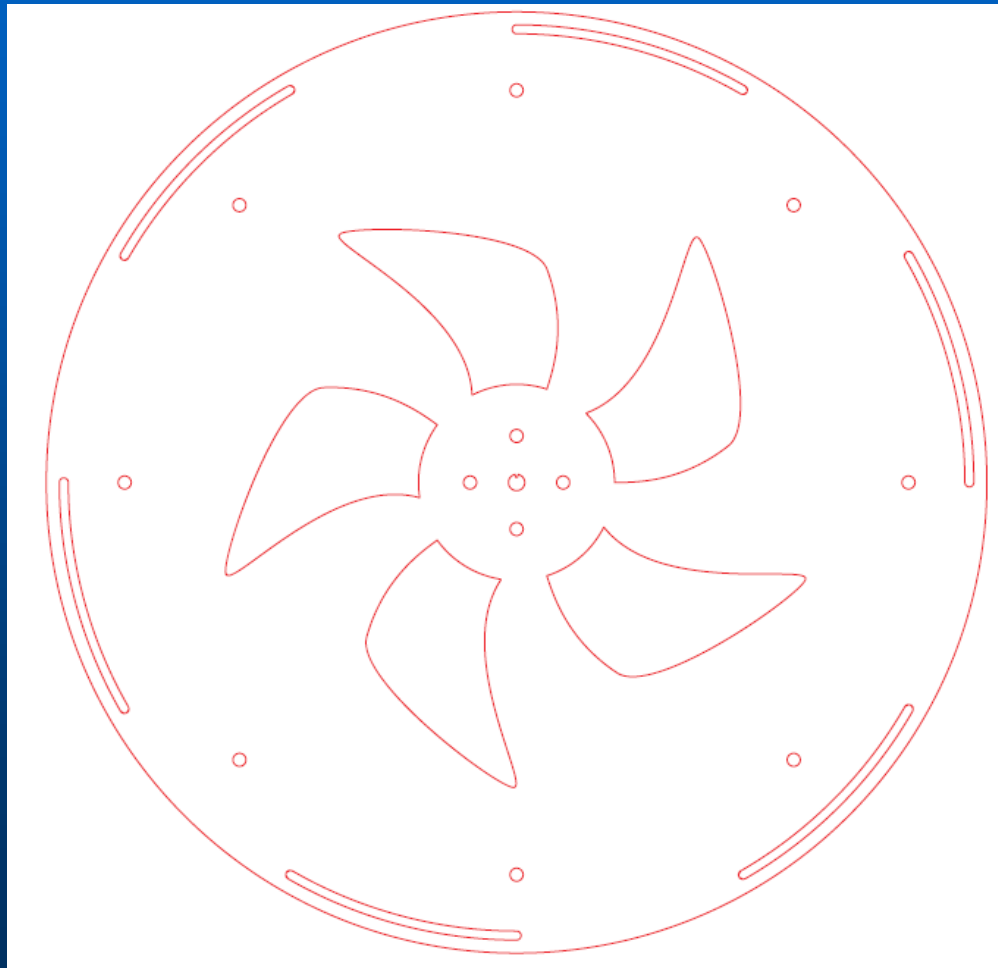


New Motor

- Problems with Drill Motor
 - Gears Slip
 - Brake on clutch
 - Motor Detached from gears
- New Motor
 - All one piece
 - No Brake



New Flywheel



New Flywheel Improvements

- Made by laser cutter
- Keeps more of the weight on the outer edges of the flywheel
- Old flywheel would not attach to new motor

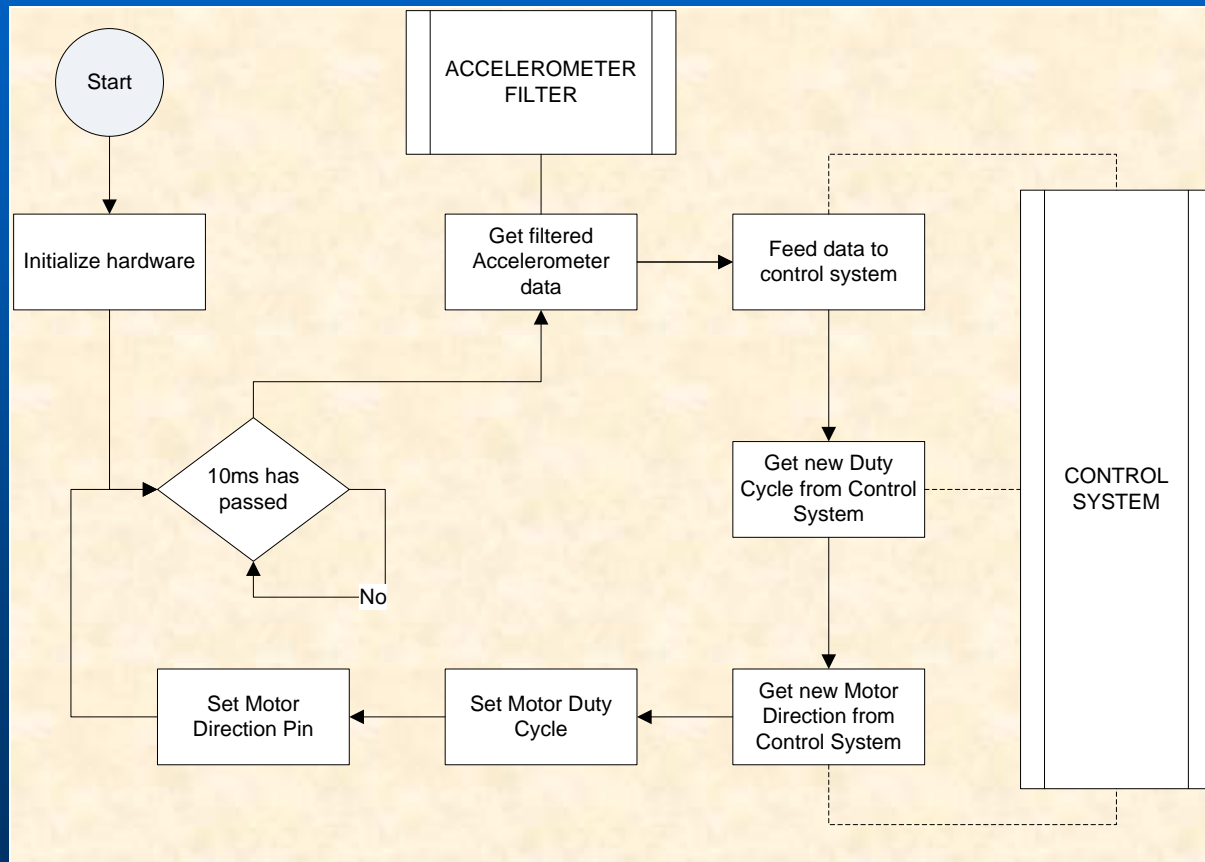


New Modifications

- ON/Off Switch
 - Safety device to enable user to manually turn off flywheel
- Offset Switch
 - Used to set the accelerometer value that is related with a balanced bicycle



Flowchart



Costs

- Spent So Far: \$288.46
 - Motor/Batteries/Charger: \$153.49
 - Accelerometer: \$34.99
 - Microcontroller: \$29.99
 - Motor Controller: \$39.99
 - Developmental Costs: \$30

- Original Projected Budget: \$461.47



Questions?



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