

Homework 1: Team Building and Project Idea

Due: Friday, January 11, at NOON

Team # 12 Proposed Project Name: The Two Wheel Deal

Team Members (#1 is Team Leader):

#1: Greg Eakins Areas of Expertise: Electrical Engineering

#2: Eric Geier Areas of Expertise: Electrical Engineering

#3: Pete Dudash Areas of Expertise: Electrical Engineering

#4: Jeremy Gries Areas of Expertise: Electrical Engineering

Project Idea #1:

The Two Wheel Deal will be personal transportation vehicle. It is based on the classic control problem, the inverted pendulum. As the rider leans forward the motors turn in proportion to the angle of lean to try and keep the wheels under the center of gravity. This in turn will move the rider forward. The same process will work when the rider leans backward enabling the vehicle to go in reverse. Turning will be accomplished using a knob on the handlebars. Turns will be made by moving one motor faster than the other or in the opposite direction. It will also be able to balance itself when a rider is not on it as well as shut down if the rider falls off. Finally it will have an LCD screen for a human interface to display various important information.

The idea for this project is a result of our team's mutual interest in electronic controls, and this project should prove to be a rigorous exercise in the area. The Two Wheel Deal is designed to make life easier for the time-stressed individual by automating the strenuous and time consuming act of walking. With its compact footprint, high power motors, and emission-free electric drive, it will be able to go anywhere that a pedestrian can go, only faster.

Table 1: Areas of Expertise

Team Member Name	Area of Expertise
Greg Eakins	Motors/Electromechanical Control
Eric Geier	Software/Interfacing
Pete Dudash	Modeling/Control/Packaging
Jeremy Gries	Modeling/Control/PCB Layout

Table 1: Cost Estimate

Component/Part	Quantity	Price	Component Cost
NPC-T74 DC Motors	2	\$324.00	\$648.00
SLA Batteries	2	\$50.00	\$50.00
Motor Controllers	2	\$120.00	\$240.00
Angular Rate Sensor	1	\$100.00	\$100.00
Dual Axis Accelerometer	1	\$70.00	\$70.00
Aluminum and Fasteners	1	\$150.00	\$150.00
Wheels	2	\$50.00	\$100.00
LCD Screen	1	\$50.00	\$50.00
Proximity Sensor	2	\$30.00	\$60.00
			Grand Total
			\$1468.00