CS 5973 – Intro to Intell Robots
Project 1 – Sensing and Movement

Group 4

• Justin Fuller
• Matthew Lawrence
• Rahul Kotmaraju
Team Organization – Task Division

- Justin: Robot Design
- Matthew: Software Design
- Rahul: Complete Documentation
- All Members: Analysis, Prelim Design, Calculations, Testing
Team Organization – Key Features

- Democratic team
- Equal share of responsibilities
Team Organization - Success

- Productive team meetings and brainstorm sessions.
- One person had the holistic view of the robot code.
- Good understanding and melding of individual ideas.
Robot Design

Initially: Caster Wheel
Later: A rigid leg bounded below by two large pulley wheels.

IR reflectance
Gear ratio - 1:1.67
Robot Code

Software consists of four phases:

• Align
  – Drive robot slowly
  – Align over tape.
  – If timeout occurs then reverse, reattempt alignment.
  – Success - Robot aligned squarely with tape facing target square.

• Cruise
  – Drive straight ahead until tape detected or timeout.
  – During low speed, light sensors ignored to ensure robot fully exits square before sensing begins. If robot detects tape, continue ahead briefly so that robot fully inside square.
  – If phase times out, then the robot has veered to one side and has overshot the square.
    • In this case, robot will back up a fixed length.
    • The target square should now be directly to either the left or the right.
• **Turn**
  - Spin the robot 90 degrees clockwise.
  - If the robot not in target square, the square will be either behind or ahead of the robot.

• **Reverse**
  - Drive the robot backward for a fixed time ensuring robot will be behind square when alignment begins.
  - After the reverse phase, the square will be in front of the robot regardless of whether the robot veered off-course during the cruise phase.