Spherical Preemptive Autonomous Rover (S.P.A.R.)

By: Onorio Franco Jr.
Trinidad State Junior College
Project Goals

- Personal

- Robotics Challenge
  Mass Divisions:
    - < 1.5 Kg
    - < 4.0 Kg
  Cost: < $500
  No flying entries
  Reasonably small in size
Advanced Sensor

- Laser Range Finder (LRF)
  - Pros-
    - Distance [6in-8ft]
  - Cons-
    - Slow response
    - Large amounts of interference
Initial Design

- Spherical Design
- Improvements
  - Two-wheeled Drive system
  - Reduced weight
  - Faster responses
Designs 1-3

#1
- Balancing wheels
- Increase surface area
- Allowed forward motion

#2
- Balancing Sled
- Use the Motors
- Used to Slide over top

#3
- 360 degrees of motion
- Important directions
Designs 4-6

# 4
- 360 degrees
- Wheel with less resistance
- Delrin Plastic

# 5
- Trailer hitch swivel
- Large wheel base
- Changed CG

# 6
- Combined Sled and wheel
- Changed rotation axis
- Increased surface area
- Changed CG
Final Product
Robotics Challenge
Challenge Results

- EEPROM failure
- Magnetic Interference
- Size influence
- Mechanical achievements
- Sensor response
Personal Results

- Main lessons
  - Test….Test…Test..then Re-Test
  - Brainstorming Importance
  - Interference importance
  - Reliable hardware
  - Just Enjoy

- Wrap-Up
  - Thoughts
  - Future
Questions?