A New Obstacle-Avoiding, Light-Seeking Mobile Robot using a PLC

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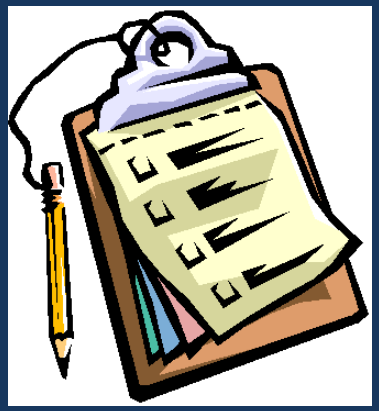
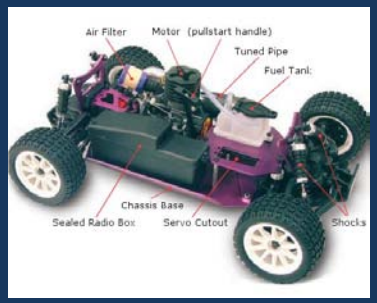
CS/EGR333

Agenda

- Initial and Simulated Designs
- Design Schematic
- Robot Analysis
- Simulation
- Alternative Control Scheme
- Questions



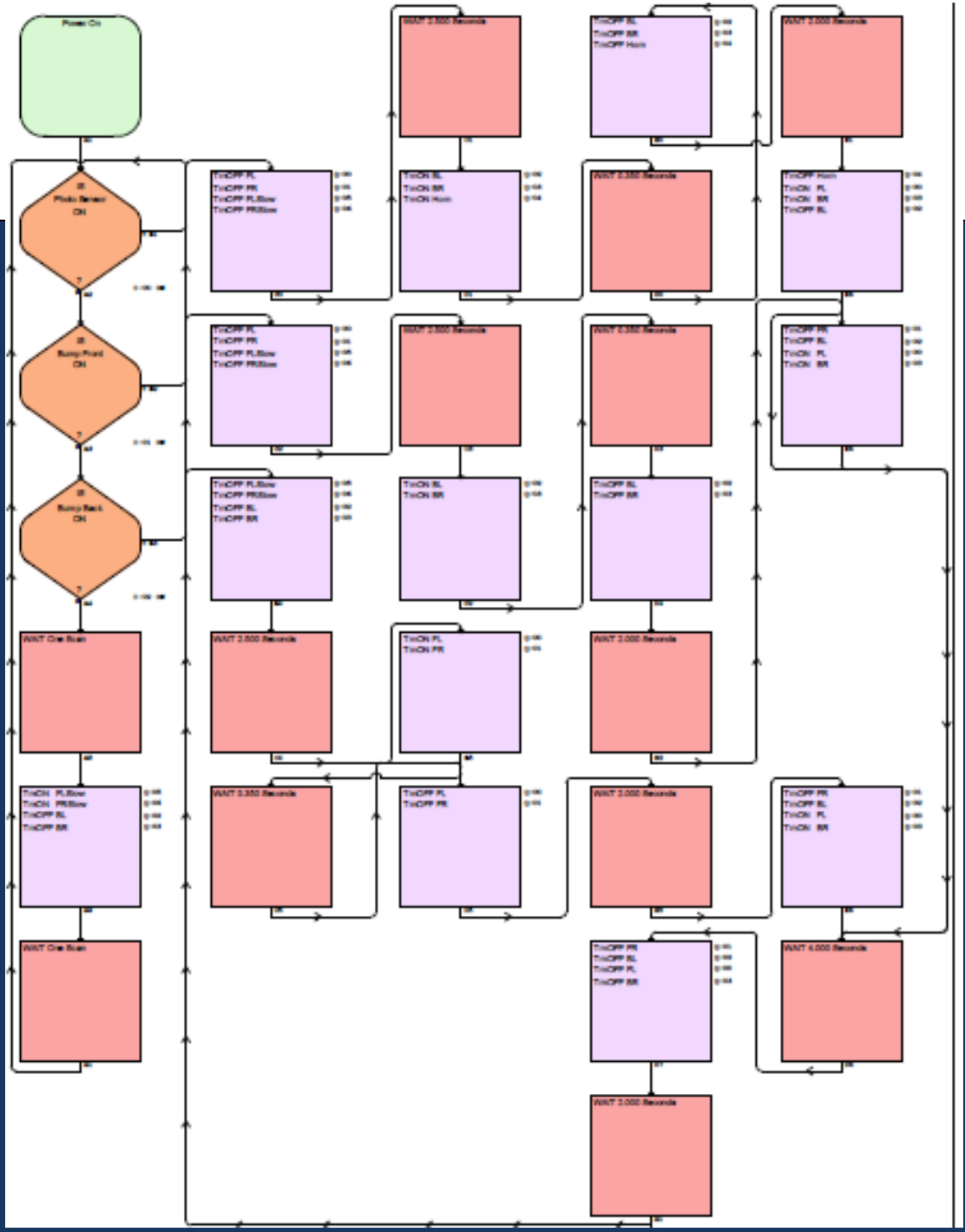
Initial Designs



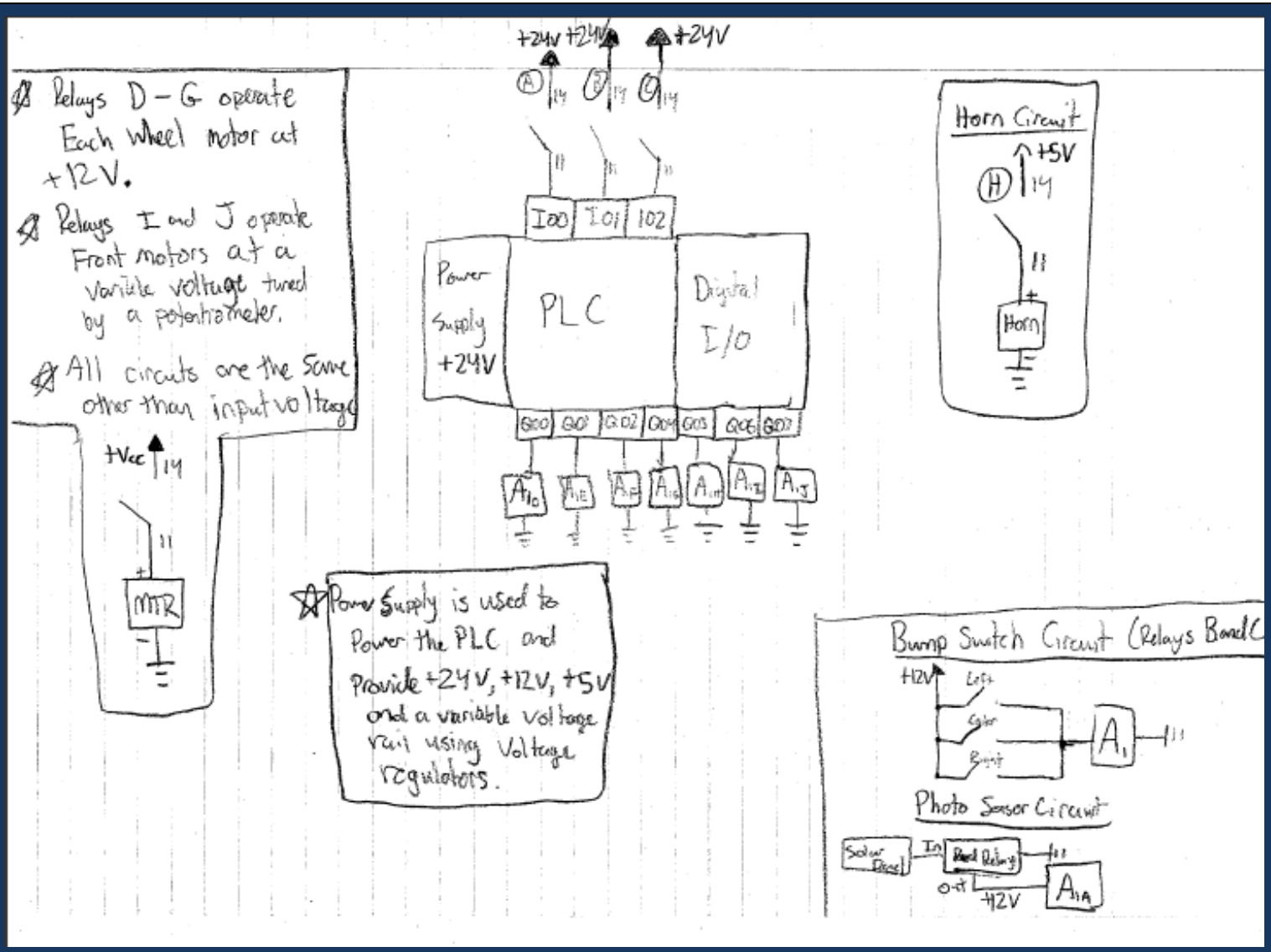
- Remote Control Car
- Liquid Level Controller
- Touch Sensing Dispenser
- Touch Sense Door Opener
- Motion Detector Light Switch
- Household Environment Control
- Power Drain Save
- Auto Fire Reaction
- Motion Sensor Lights
- Sprinkler System Control
- Assistive Technology PLC
- PLC for Remote Villages
- Marine Biology PLC
- Smart House PLC
- PLC for Power Plants

Designs Simulated

1) Remote Control Car
2) Touch Sense Door Opener
3) Power Drain Save
4) Combination of 1, 2 and 3


Power On
IF
Photo Sensor
ON
IF
Bump Front
ON
IF
Bump Back
ON
WAIT One Scan
WAIT One Scan
WAIT 2.000 Seconds
WAIT 0.350 Seconds
WAIT 4.000 Seconds

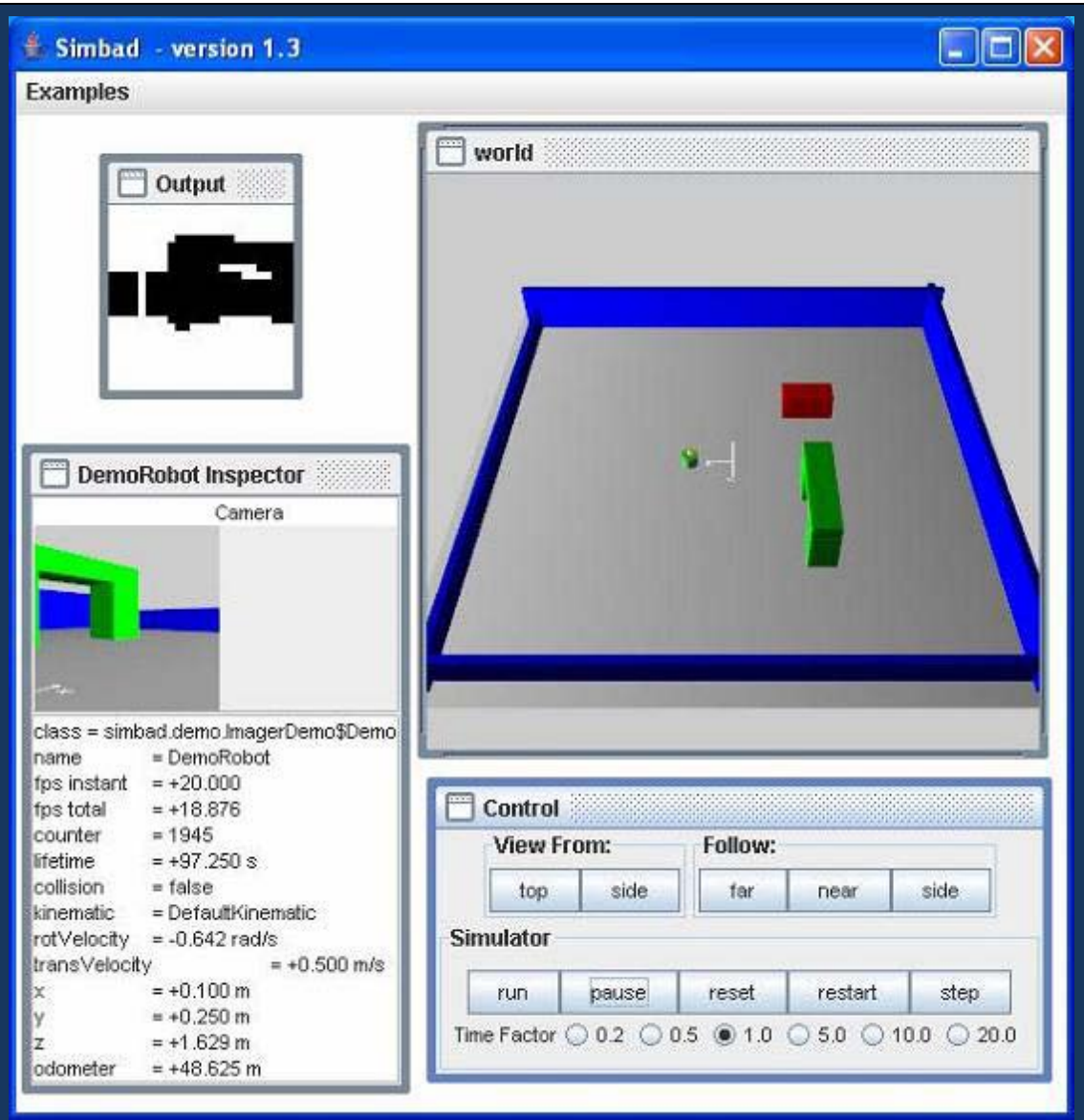
Design Schematic



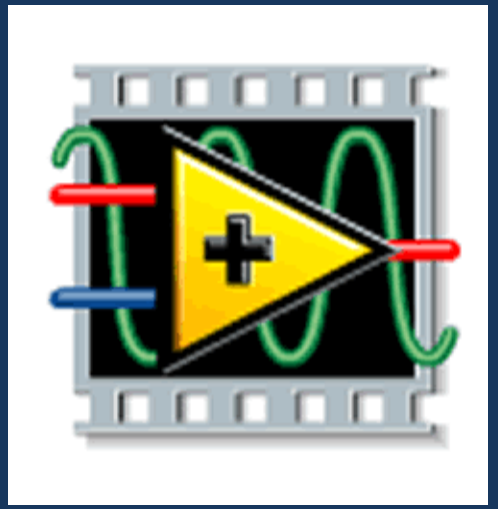
Robot Analysis

- 4 Wheeled Robots – difficult to achieve ZTR
- Controllability vs Manuverability
- Need High Torque Motors– Slid/Skip
- Slid/Skip difficult with high friction

Simulation Using Simbad



Alternative Control Scheme



LabVIEW

Pros:

- Very powerful program with a lot of options
-Would allow us to implement all of our designs easily and effectively
- Would allow us to implement other possible designs/features

Cons:

- Would require a laptop able to run LabVIEW
- Not enough space
- Plexi-glass base could not support weight
- Current motors could not move with
- Unnecessarily sophisticated for our robot

Assessment: Therefore, LabVIEW would not be very feasible.

Alternative Control Scheme

Microcontroller

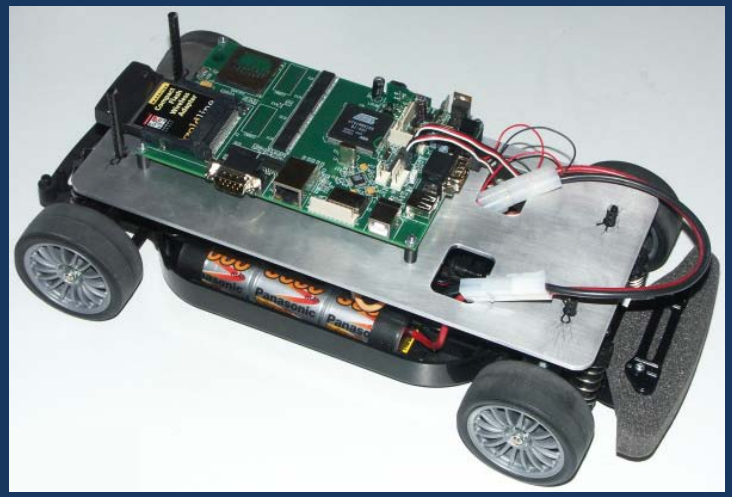
Pros:

- Simple coding would cover all the current features of the robot
- Can perform more complicated tasks and calculations

Cons:

- Microcontroller is slightly more complicated than the PLC

Assessment: The microcontroller is a practical alternative for the PLC in regards to the robot.



Search Algorithm Simulation

Thank You For Your Attention

Any Questions?