

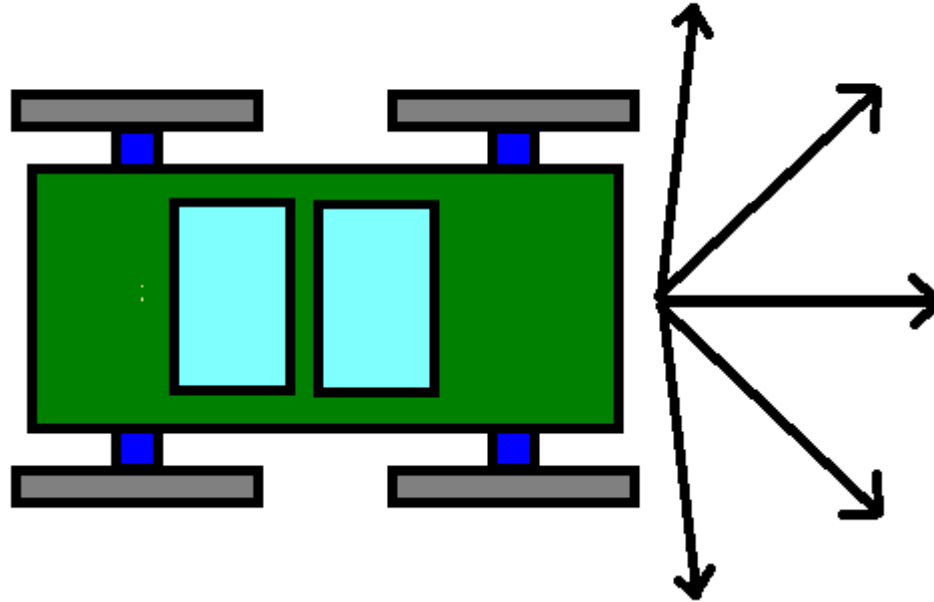
# **ECE 511: Obstacle Evading Ultrasonic Robot**

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# Overview



# Hardware Presentation

- Our robot will use the following hardware:
  1. MSP430 controller, tri-state buffers for each of the sonar sensors, H-bridge for PWM control of DC motor.
  2. Array of five ultrasonic range finders arranged in forward facing array. Sensors will be mounted at -80, 40, 0 , 40 and 80 degree angles where 0 degrees represents the primary forward axis of the vehicle.
  3. Servo controlled front wheel with explicit steering mechanism
  4. Rear wheel drive mechanism with differential powered by DC motor.
  5. Rechargeable batteries

# Software Development

- Two PWM signals generated from the timer/counter to steering servo position and drive motor speed.
- I2C interface to 6 ultrasonic range finders.
- Control Algorithm for obstacle avoidance

# Timeline

- Oct 14<sup>th</sup>
  - Build Vehicle Lego Body JC,
  - Electrical Block Diagram AMC,
  - Verify communication with sensor JC
  - Evaluate performance characteristics AH
- Oct 21<sup>st</sup>
  - Electrical Detailed Schematic AMC,
  - Vector Addition Algorithm EW
- Oct 28<sup>th</sup>
  - PID Algorithm EW
  - Electrical Prototyping (PCB possible) AMC
  - Start on Hardware/ Software Integration ALL
- Nov 4<sup>th</sup>
  - Re-Evaluate performance characteristics AH
  - Testing/ Troubleshooting/ other improvements ALL
- Nov 15<sup>th</sup>
  - Final Presentation Preparation ALL
  - Improve Vehicle body ALL