# Beacon and Obstacle Navigation for an Autonomous Rover:

## *The Mechanical Engineering Side of an Experimental Robot*

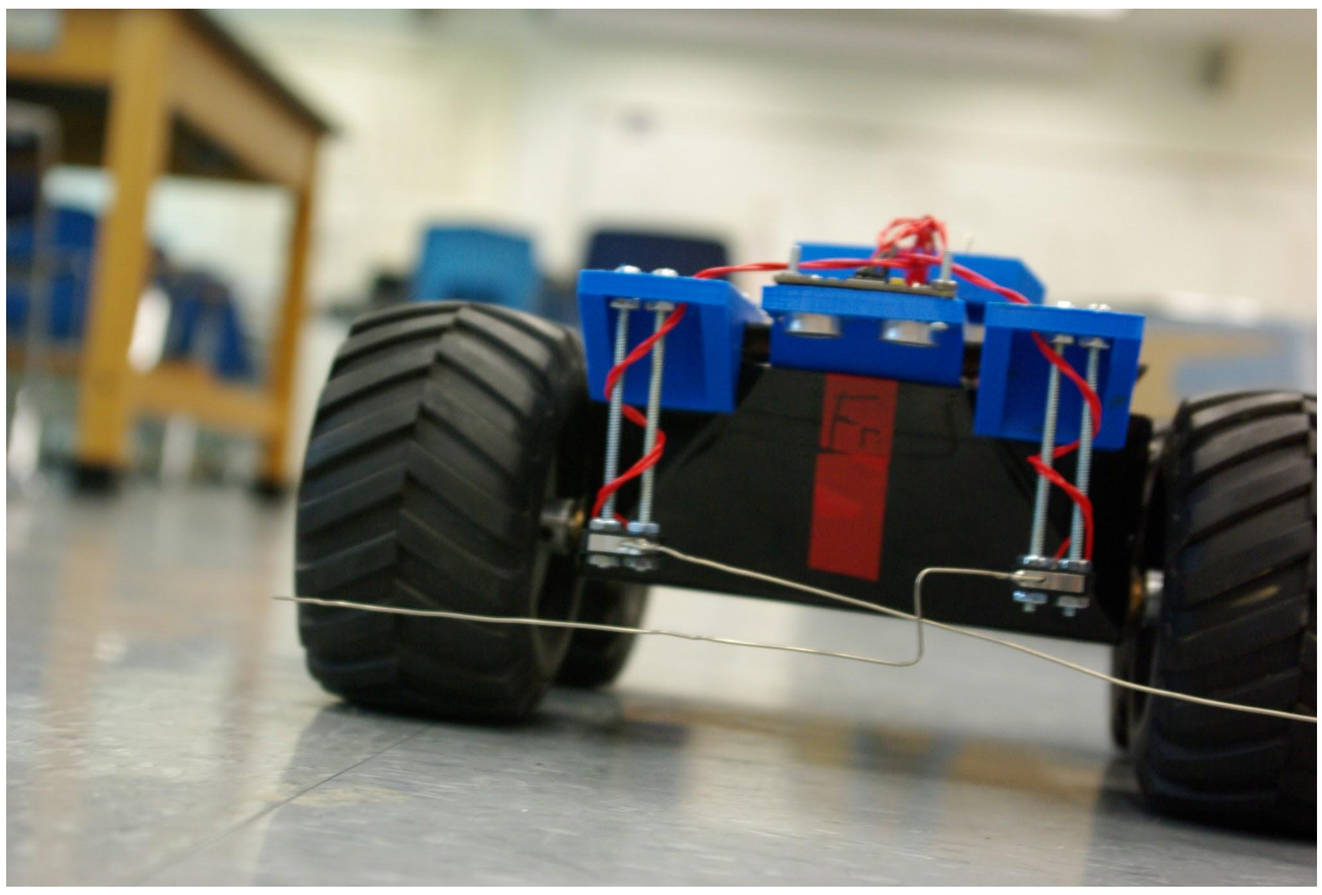
**Richard Ortecho** **Timothy Helmer**

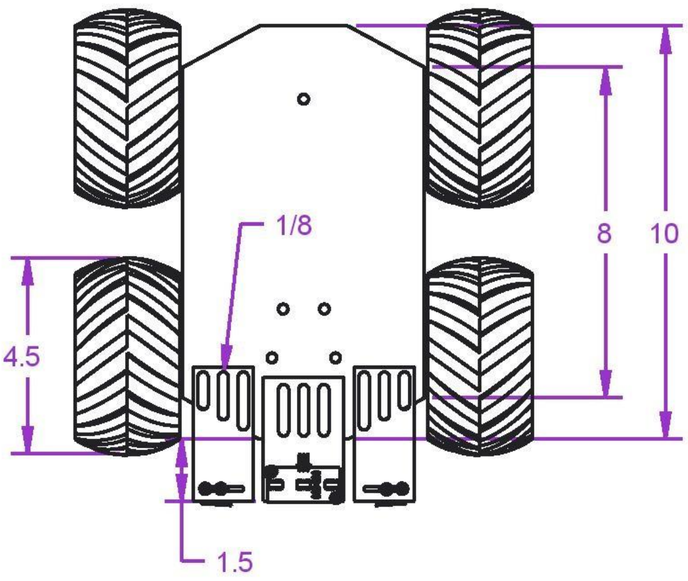
**Abstract:**

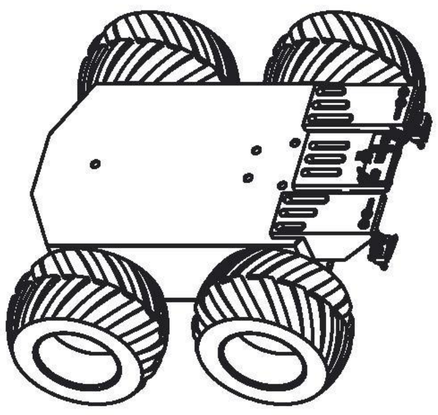
At UNC, there was a project called the Lazarus Project. The Lazarus Project was an engineering and physics project where the challenge was to design and construct four autonomous robots. Our group took one of the smaller robots from the Lazarus Project, called "Mousebot", and upgraded its sensors and code to track a beacon and avoid obstacles. This study will be reviewing all of the work done by the team that I am involved in as we made upgrades and changes to our autonomous rover. The purpose of this project is to roughly follow the guidelines of the Colorado Space Grant Consortium Robotics Challenge. We had to design and create a robot that could roam a simulated terrain of the planet Mars without destroying its ability to function properly. These were the basic guidelines of the Robotics Challenge. The Mousebot is now partially operational; the terrain maneuverability is functioning, but the beacon navigation is not integrated into the Mousebot yet.

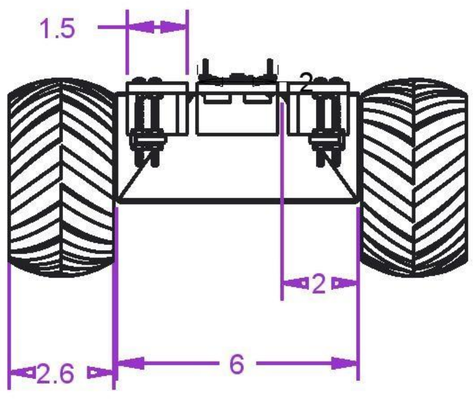
## Challenge overview

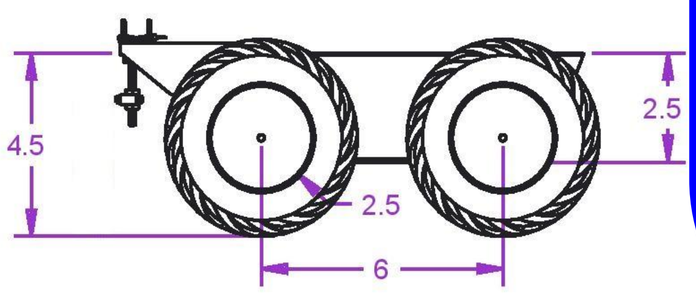
- <4 kg
- < 500 dollars spent on the project
- Must remain in contact with ground
- No larger than 20in. x 20in. x 20in.
- No biohazardous materials used
- Completely autonomous
  - No human intervention
- Only use the provided beacon signal
  - No GPS or other locating methods








## Documentation

Documentation of our progress on the LAZARUS is imperative to ensure that future generations of UNC students may use the Mousebot platform as a springboard for future research.

We recorded design ideas into a journal and pictures were taken to ensure that we can show you the process