

# *The Gopher Tortoise Scope*

*Sponsored by*

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The Tall Timbers Research and Land Conservancy

*In partnership with*

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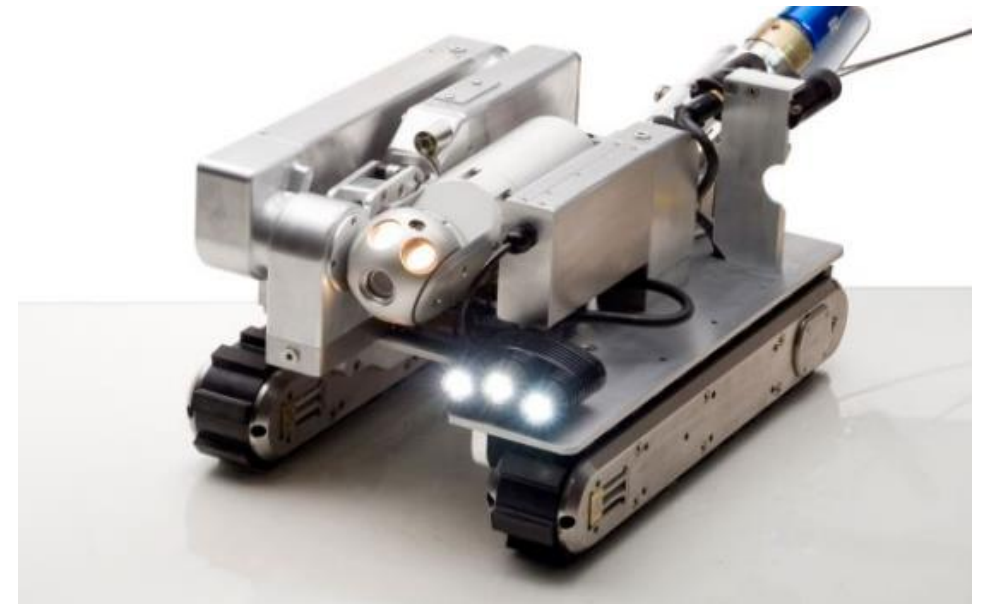
# Overview

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- Background
- Needs Analysis & Objective
- Major Subsystem Descriptions
- Prototype Design
- Budget Analysis
- Scheduling
- Summary

# Background

- Tall Timbers' research focuses on fire-dependent ecosystems
- Their current scope has several design flaws
- Possible replacement products are out of their price range



The “Versatrax 450 Tank and Tunnel Crawler” by Spectrum Instruments. [1]

# Needs Analysis

Current gopher tortoise scopes have one or more of the following issues:

- Cumbersome and heavy
- Not waterproof or shockproof
- Lack of data acquisition capability
- Poor visibility
- No infrared capabilities
- Expensive

*“There is a need for a gopher tortoise scope that has greater mobility, improved weather and impact durability, increased data-acquisition capability, and reduced size, weight and cost.”*

# Objective

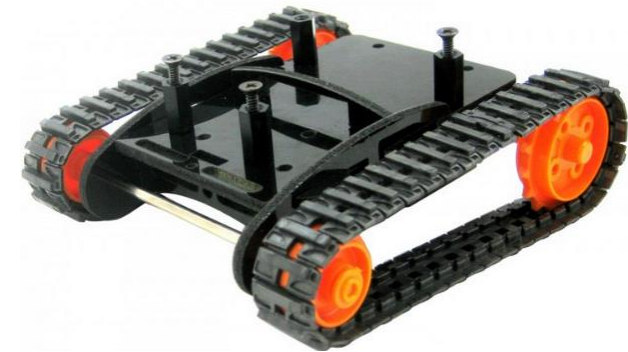
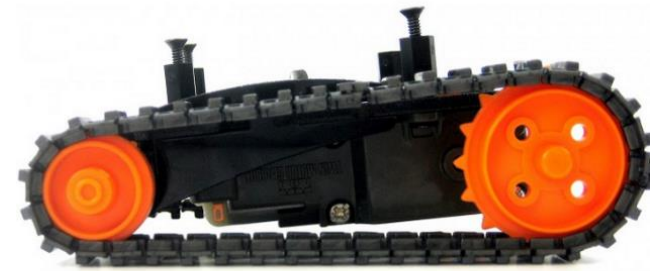
Our objective is to create a design that is:

- Durable
- Capable
- Portable
- Affordable

*“The main goal is to design a mechanism that has versatile sensors, better durability, and more advanced video capabilities than the current system in order to enhance the surveying process of gopher tortoises.”*

# Chassis Design

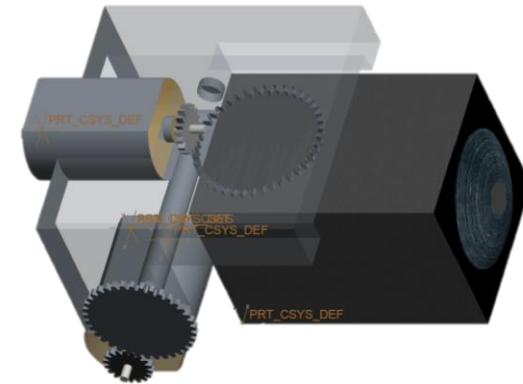
- The chassis must be able to function in:
  - Small underground burrows
  - Inclement weather
- Our design will feature:
  - Tracks with treads
  - Plexiglass housing
  - Less than 6 inches in width
  - Less than 4 inches in height



Angle- and side-view of the prototype chassis. [2]

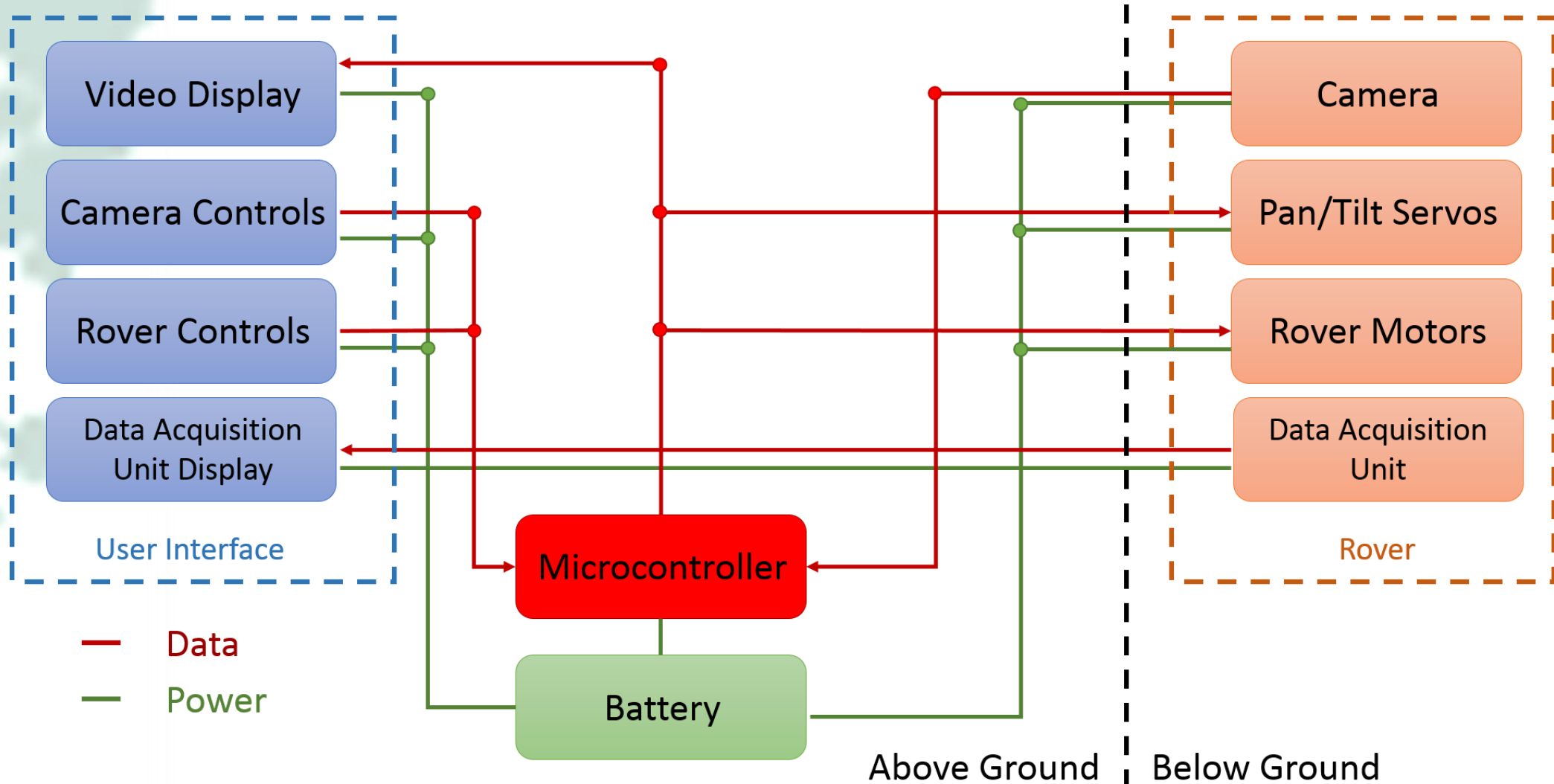
# Camera Design

- Purchase Camera (\$34.50)
  - Wide view color infrared camera
  - 7 IR LEDs
  - 25mm (.98 in) diameter
  - Night vision range: 6m
- Build Pan and Tilt System
  - 2" x 2" x 2.5"
  - Custom fit to camera and chassis
  - Smaller than off-the-shelf
  - Will require two motors (\$3.99)



Prototype camera [3]  
and pan and tilt system.

# Block Diagram





# Prototype Design

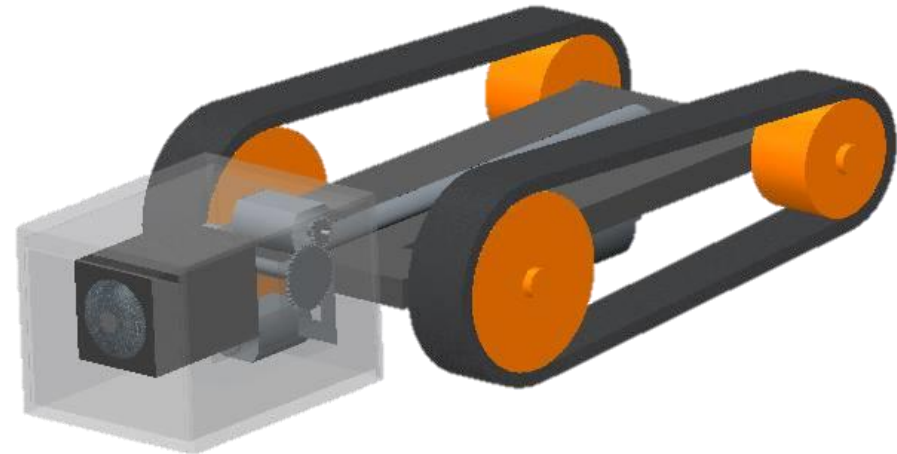
Two designs will be analyzed during the prototyping process:

Design A



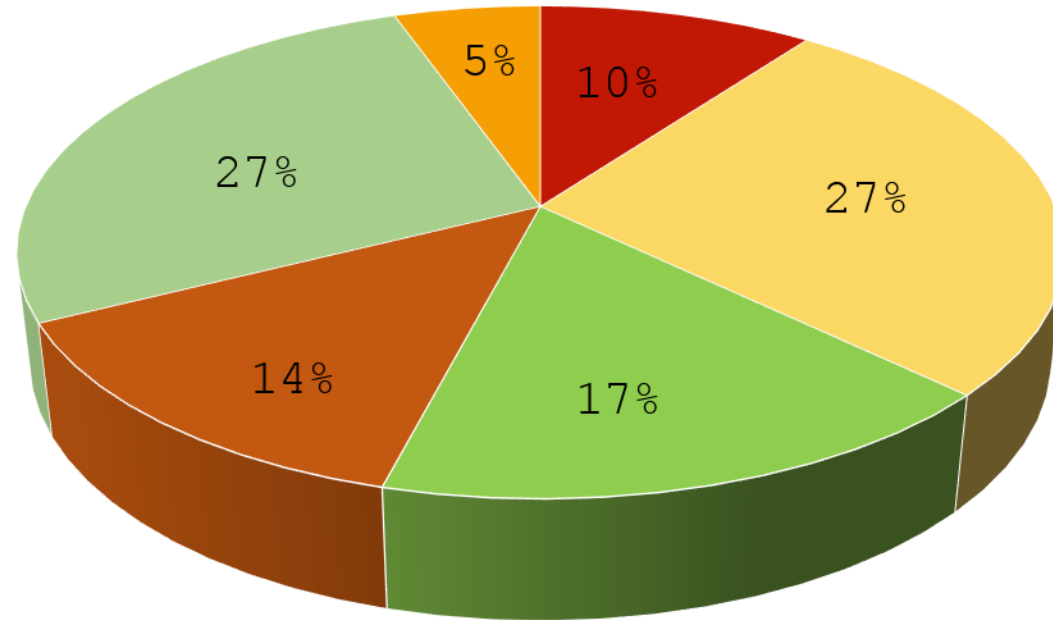
Camera is placed within the housing of the chassis

Design B



Camera is in front of the chassis and separate from the main housing

# Budget Analysis



■ Camera System  
■ Tether System  
■ Power

■ Rover System  
■ User Interface  
■ Data Acquisition Unit

# Scheduling

Task Name	Duration	Start	September 1		October 1		November 1		December 1		
			8/31	9/14	9/28	10/12	10/26	11/9	11/23	12/7	12/21
Project Assignment	6 days	Mon 9/1/14	█								
Ice Breaker	6 days	Mon 9/1/14	█								
Meet with Project Sponsor	11 days	Mon 9/1/14	█	█							
Code of Conduct	5 days	Mon 9/1/14	█								
Meet with Academic Advisor	11 days	Mon 9/1/14	█	█							
Needs Assessment	10 days	Mon 9/15/14		█	█						
Initial Web Page Design	20 days	Mon 9/22/14			█	█	█				
Component Breakdown	14 days	Mon 9/29/14			█	█	█				
Decide CAM/Tilt and Pan	14 days	Mon 9/29/14			█	█	█				
Purchase Prototype Material	7 days	Mon 10/6/14			█	█	█				
Initial Prototype	18 days	Mon 11/3/14					█	█	█	█	
Begin Testing	20 days	Mon 11/17/14							█	█	█
Midterm Presentation 1	2 days	Thu 10/16/14				█					
Midterm Report 1	15 days	Mon 10/6/14			█	█	█				
Midterm Presentation 2	7 days	Mon 11/3/14					█	█			
Final Web Page Design	47 days	Mon 9/22/14		█	█	█	█	█	█	█	
Final Design Presentation	7 days	Mon 11/24/14							█	█	
Final Report	10 days	Mon 11/24/14							█	█	

# Summary

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- Identified problems with current scope design
- Analyzed component needs
- Proposed two prototype designs
- Established a schedule

# References

- 1) "Versatrax 450 Tank and Tunnel Crawler." Versatrax 450 TTC. Spectrum Instruments, 2010. Web. 14 Oct. 2014. <[http://www.spectrum-instruments.com/products/optical/documents/VT450\\_TTC.pdf](http://www.spectrum-instruments.com/products/optical/documents/VT450_TTC.pdf)>.
- 2) "Mini RobotShop Rover Chassis Kit." Mini RobotShop Rover Chassis Kit. RobotShop, 2014. Web. 14 Oct. 2014. <<http://www.robotshop.com/en/mini-robotshop-rover-chassis-kit.html>>.
- 3) "Wide View Color Infra Red Camera with 7 IR LEDs." Wide View Color Infra Red Camera with 7 IR LEDs. SuperDroid Robots, n.d. Web. 14 Oct. 2014. <<http://www.superdroidrobots.com/shop/item.aspx/wide-view-color-infra-red-camera-with-7-ir-leds/1121/>>.

# Questions?

For more information go to: [eng.fsu.edu/~sharisi/TEAM21/index.html](http://eng.fsu.edu/~sharisi/TEAM21/index.html)