

# Team 10

## GOLIATH Autonomous ATV

*Group Members:*

Michael Brazeau	Marc Akbar	Jeremy Hammond
Omesh Dalchand	Lester Kendrick	Merrick Salisbury
	Nahush Kulkarni	

*Advisors:*

Dr. Chiang Shih	Dr. Kamal Amin	Dr. Michael Frank
Dr. Oscar Chuy	Dr. Emmanuel Collins	

*Instructor:*

Dr. Kamal Amin



# Background/Needs

- CISCOR focuses on mobile robotic path-planning
- Requires a more robust autonomous off-road platform
  - All Terrain Vehicle
- Previous ATV work included remote control
  - Actuators installed
    - Gear shift
    - Throttle
    - Brake
    - Steering



# Objectives

- Integrate a sensory system that will scan the surrounding environment to perform simple autonomous navigation
  - Proof of Concept
  - Low speed testing, no obstacle avoidance
- Will be used as a future research platform for CISCOR

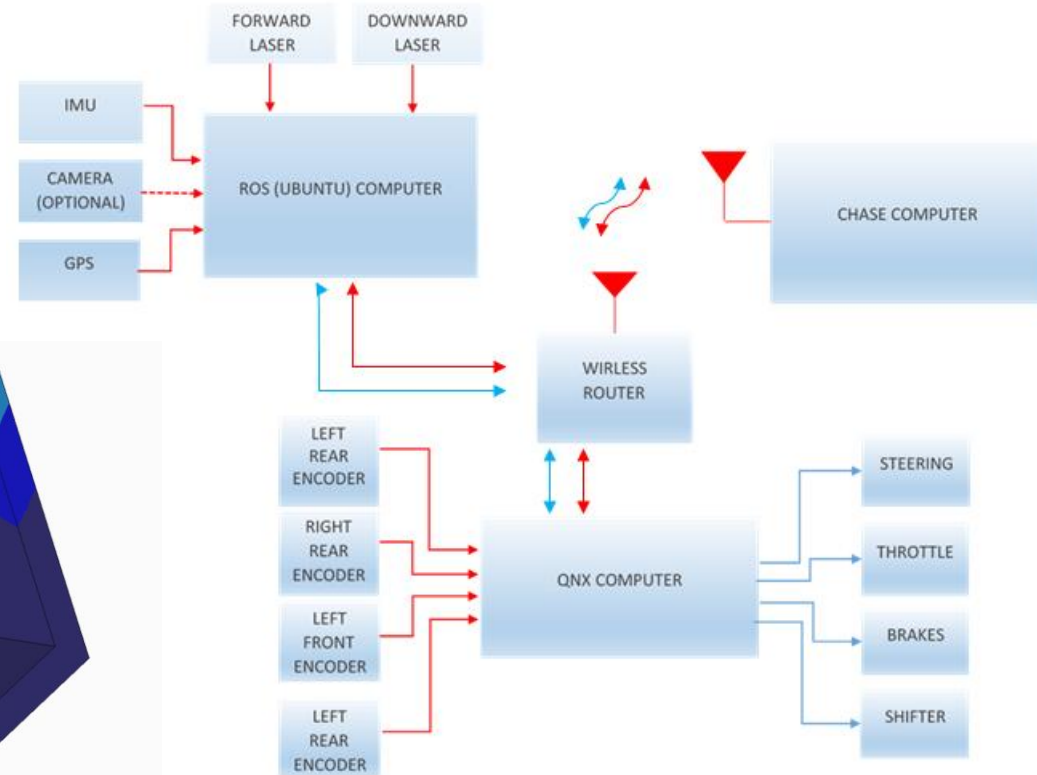
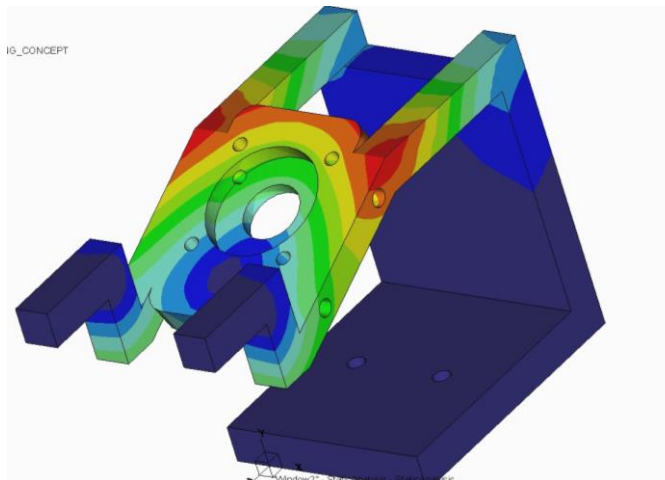


# Task Breakdown



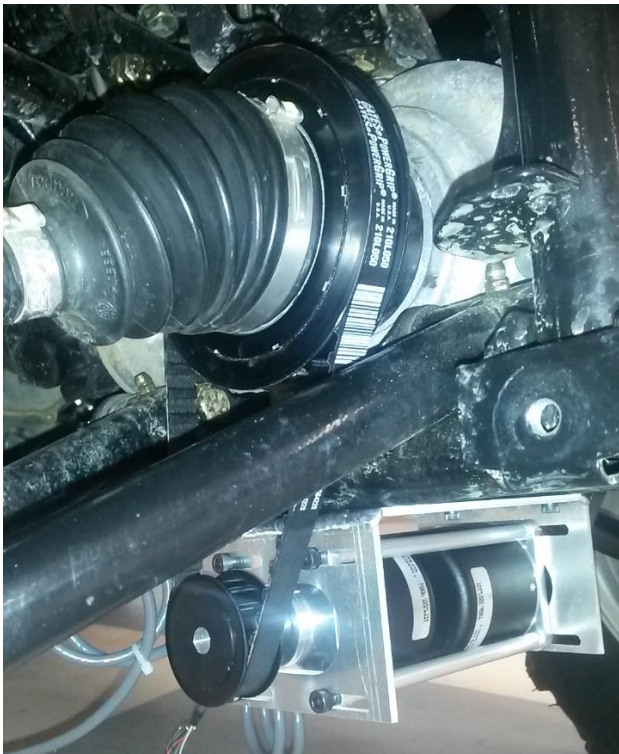
# Fall Accomplishments

- Designed and analyzed the sensor mounts
- Started waypoint navigation and road following coding
- Created system for communication



# Recent Accomplishments

- Fixed pulley machining error
- Encoder mounting complete



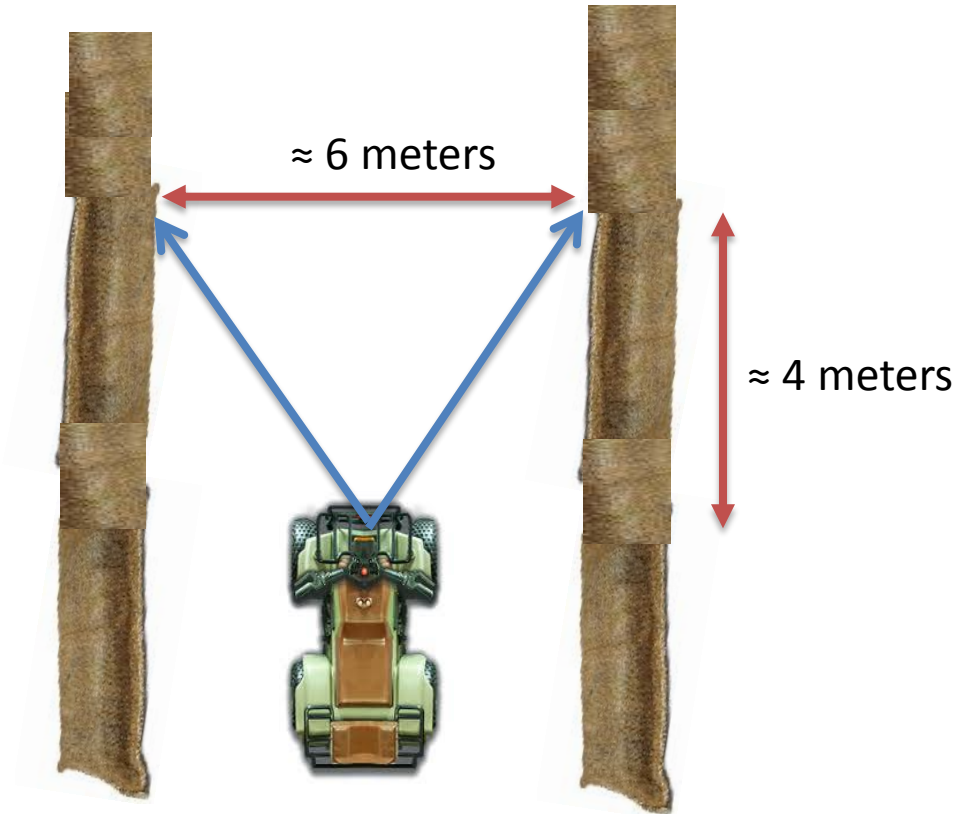
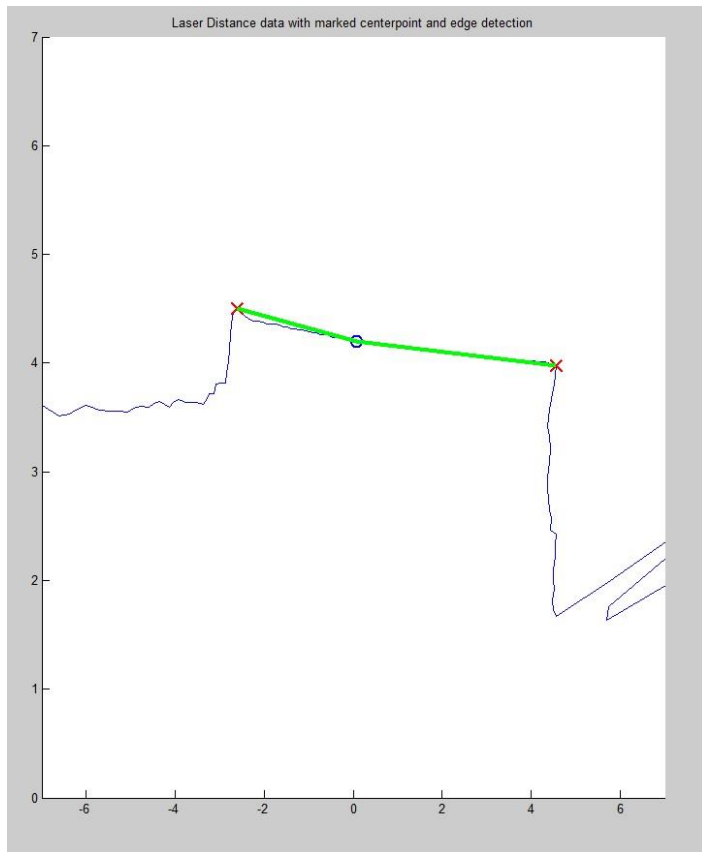
# Recent Accomplishments

- Laser mounting almost complete
- Final crossbar assembly required



# Road Following

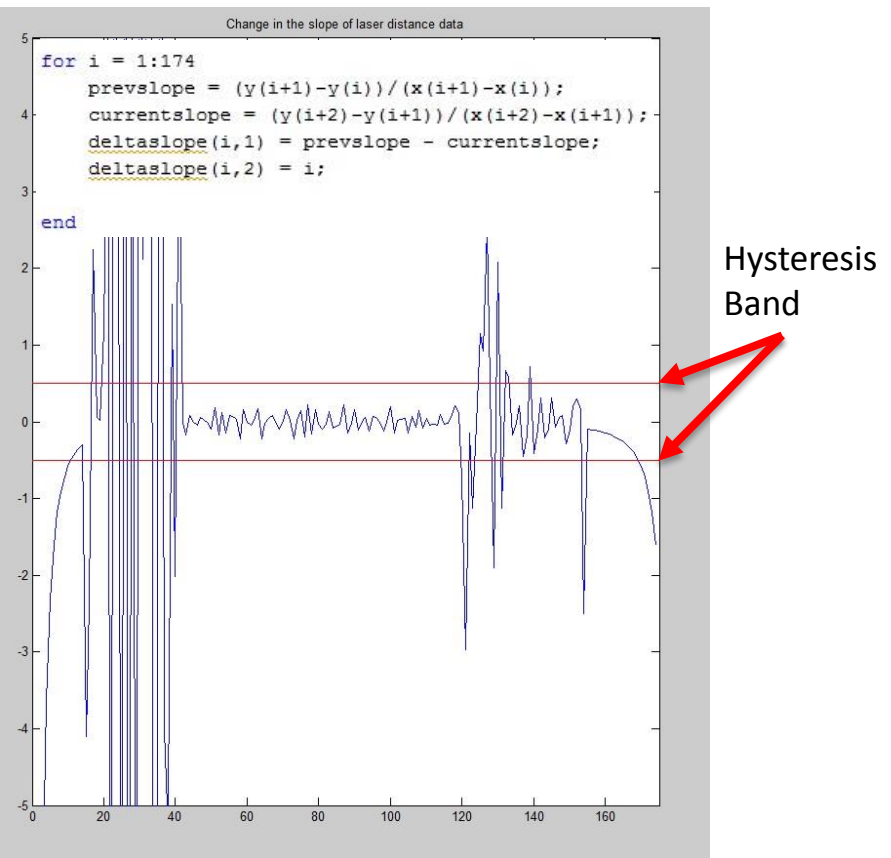
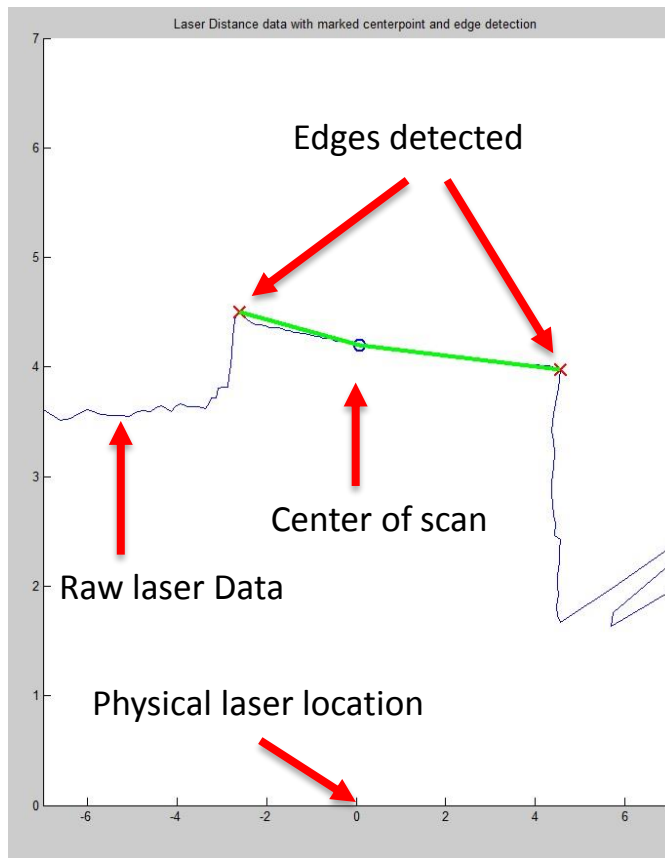
- Raw laser data





# Road Following

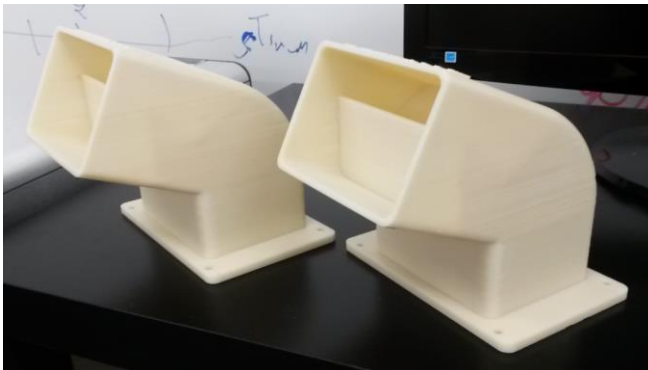
- Laser data acquisition and manipulation





# Future Work

- Finish laser, GPS, steering, and IMU mounting
- Complete snorkel assembly
- Test autonomous algorithms
- Finish computer / sensor communication



# Potential Challenges

- Possible erroneous GPS / laser data
  - Running average, code filtering
- Time for testing
- Waiting on QNX driver from CISCOR employee
- Integrating all systems
- Debugging code

# Procurement Status

- All major components have been received
- RF relay ordered
- Cost analysis
  - Budget: 1500.00
    - Raw materials: 470.65
    - Fasteners: 62.22
    - 3D printing: 300.00
    - Total: 832.87

# Conclusions

- Slightly behind schedule for mechanical testing
  - Mechanical designs finalized
  - Most parts already fabricated
- Part procurement complete
- Accurate GPS and laser data received
- Coding for other sensor drivers still in progress

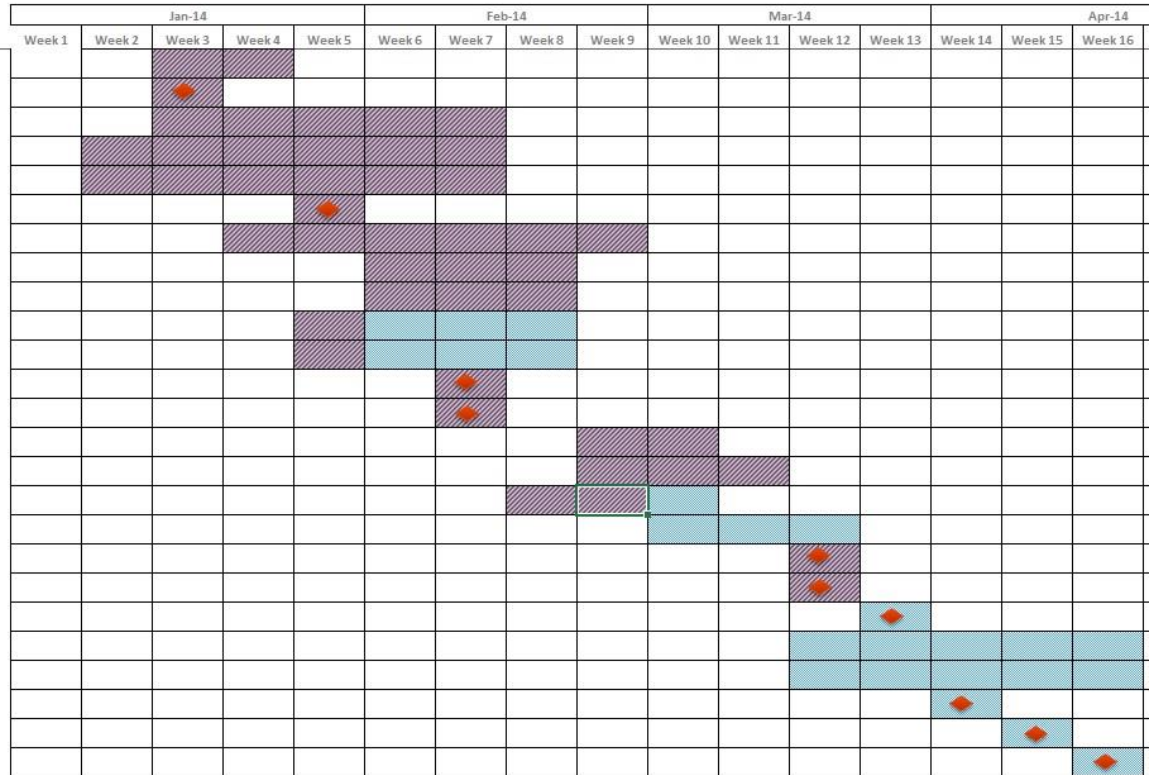
# Spring Schedule/ Gantt Chart



## Team 10 Autonomous ATV (GOLIATH)

ACTIVITY      Start date    End date      Percent complete

ACTIVITY	Start date	End date	Percent complete
Part Ordering			0%
Updated Plan/Specs			0%
Finalize Mechanical Designs			0%
GPS Communication/Testing			0%
Laser Communication/Testing			0%
Webpage Update			0%
Part Manufacturing			0%
Initial Installation			0%
Initial Part Testing			0%
IMU communication/Testing			0%
ROS/QNX Communication			0%
Midterm 1			0%
Midterm 1 Presentation			0%
Finalize Part Installation			0%
Final Part Testing			0%
Autonomous Code			0%
Autonomous Code Testing			0%
Midterm 2			0%
Midterm 2 Presentation			0%
Operational Manual			0%
Finalize Algorithms			0%
Final Testing			0%
Manu/Reliab Report			0%
Walkthrough			0%
Open House			0%



# Fin

Questions?  
Comments?

Special thanks to Nahush Kulkarni