University Rover Challenge 2025-

Alec- URC Chief Engineer (PhD student)

URC Competition Team Meeting
2025-09-12
UTSA - AET Room 1.202

Theme by By Raphaël Hertzog <hertzog@debian.org>

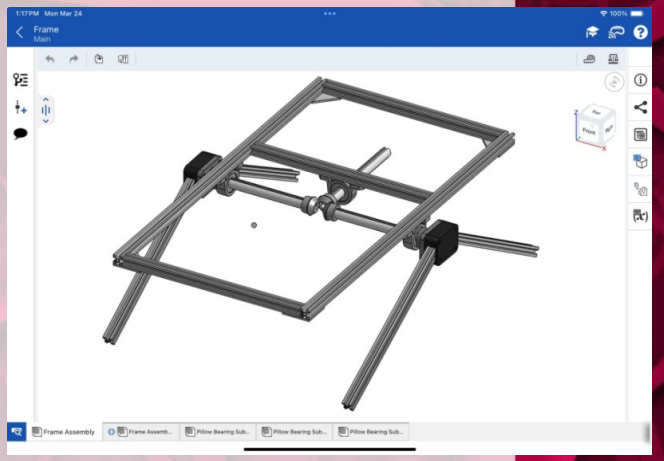
Missions

- Science (life detection)
  - Drill 10cm, collect soil samples, analysis
- Delivery (carry objects to astronauts)
- Equipment Servicing (interact with equip.)
  - Carry objects
  - Type on keyboard
- Autonomy (Autonomous navigation)
  - GPS and Visual Markers

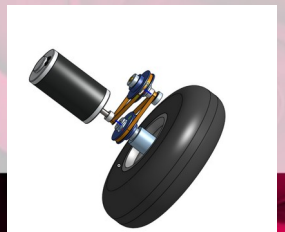
Rover Module Teams

- Rover – base system
  - Leader: Matthew
- Autonomy – Control and autonomy software
  - Leader: Preston
- Arm – carry and interact
  - Leader: David
- Science – collect and analyze samples
  - Leader: Alec

Rover Module



- Onshape
- Mechanical
  - Drivetrain
- Electrical power distribution
  - Electronic speed controllers
  - Lithium-Polymer (LiPo batteries)
- Software
  - ArduRover: https://ardupilot.org/rover/

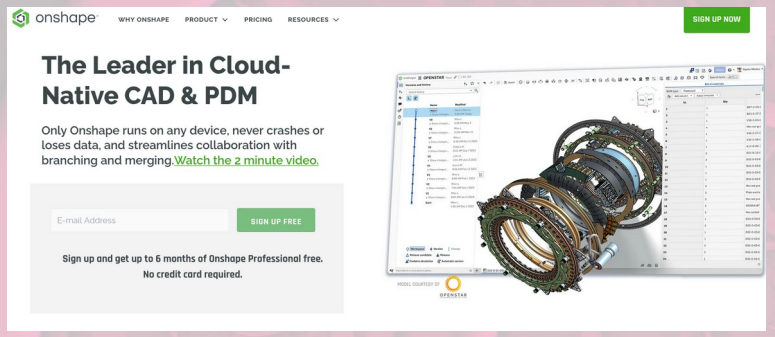


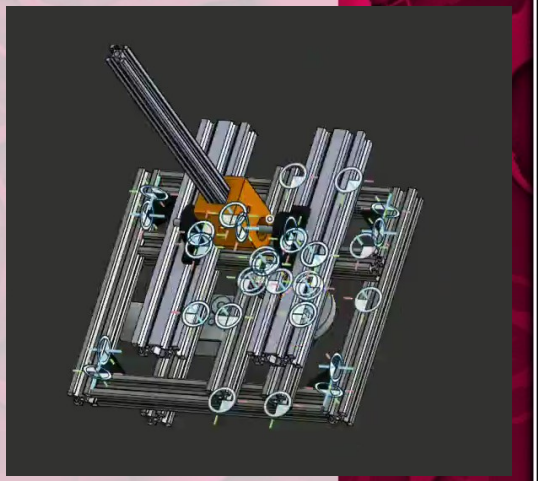
Autonomy Module

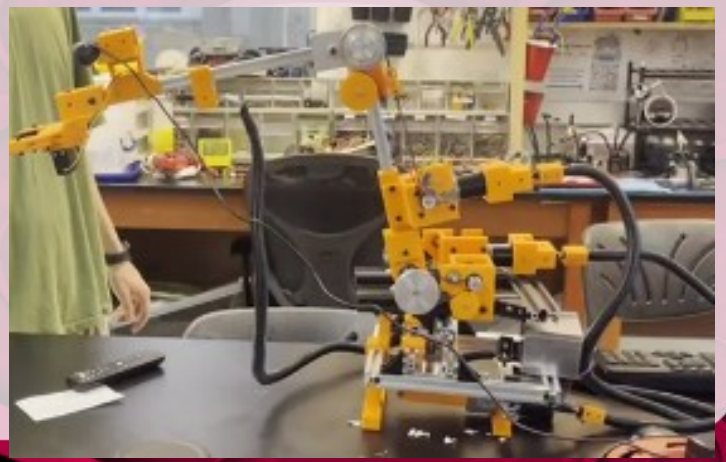
- Software
  - Linux
  - ROS 2
  - Python
  - Computer Vision
  - MAV-ROS / ArduRover: https://ardupilot.org/rover/
- Sensors
  - Realsense depth camera
  - GPS

Arm Module

- Onshape
- Arm design
  - 10lbs
  - 3ft max reach
  - Type on keyboard (end effector design)

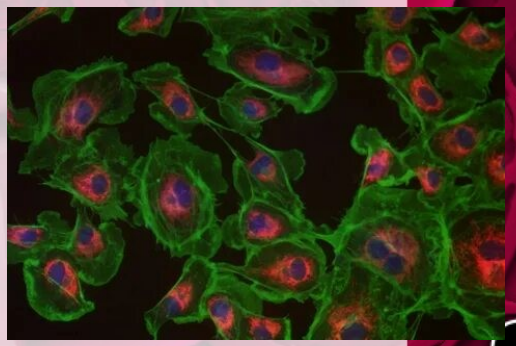






Science Module

- 10” Sampling Drill
- Sample Collection and Storage
- Automated Sample Processing
- AI Epifluorescent Microscope



Timeline

- December 2025 – working prototype rover
  - Rover Complete – 1mi remote operation
  - Arm functional, can lift 10 lbs
  - Science module can collect and analyze sample
- February 2026 – Design Review Videos
- May 2026 – Competition!

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