High-level Schedule

Q1: Rollocopter Mobility and Autonomy
Q2: Rollocopter/rover coordination
Q3: Multi-agent Autonomy and communication
Q4: Testing and robustness

CS/EE/ME 75

Plan → Prototype/Test → Integrate

Qualifying (04/22/19)

SURFs?
CS/EE/ME 75(a) projects

• “Drive-o-copter”
  • Alternative to JPL rollocopter
  • Potentially better ground operation
  • Easier, modular build

• “Shift-o-copter”
  • Lightweight shifting mechanism to reroute power from prop.s to wheels
  • Alternative to JPL rollocopter
  • Potentially better ground operation
CS/EE/ME 75(a) projects

• “Battery Swap”
  • Multi-hour mission is envisioned.
  • Current multi-rotor run time ~10 minutes
  • Must support multiple swaps/recharges

• Ground Robot Team
  • How to model rough terrain?
  • How to motion plan in rough terrain?
  • Modular autonomy package

• New Vehicles?
Rover Robotics “Open Source Rover”

Spin-off of RoboteX “Emergency Response” Rovers
Rock Crawlers
- Best on Rocky Terrain
- Very “springy” chassis
- Less efficiency, especially on flat ground

Monster Trucks
- Balanced performance
- Stiffer chassis/body
- Less ground clearance

Buggies
- Best for speed on undulating terrain
- Top speeds far in excess of needs
- Stiff suspensions

Killer Krawler 2
~$2,000-$2,300

Rampage MT Pro V3
~$1,800-$2,000

Losi 1/5 Desert Buggy XL-E:1
~$1,300-$1,800
CS/EE/ME 75(a) projects

- “Sensor Fusion”
  - Fuse IMU and Velodyne
  - Fuse IMU, Velodyne, RealSense

- New Issue: IMU/Velodyne calibration
CS/EE/ME 75(b): Next Steps

• Next Goal: Critical Design Review (3-4 weeks)
• Next Steps:
  • Design Details
  • Prototypes

Assignment:
• Choose one component of your project
• Develop a detailed design
• Present design next week
• Present prototype in 2 weeks