NOVA
ROVER TEAM
OzSpace 2019
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Who are we?

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Our Mars rover

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What we do

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Our History

- 1st Team From Australia
- 1st Team From Southern Hemisphere
- Achieved Perfect Score in Science Task in 2018
- Placed 9th out of 86 in 2019

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Science Mission

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Science Mission

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Science Requirements

- Determine presence of life
  - No life, extinct or extant
- Provide data on habitability
- Analyse local geology

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Our Scientific Protocol

- Study satellite data of area and determine local geology
- Extract soil sample
- Analyse soil sample
- Log continuous environmental data
- Identify rock samples
- Conclude if life is not present, extinct or extant

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Scientific Capability

- Solid-stem auger
- Wet and dry sieves
- Rapid BCA and FDA assays to detect protein and enzyme activity
- Custom built in-house rotary spectrometer
- Environmental sensors
- High Definition camera feeds

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Science Mission - Opportunities

- Raman spectrometer
- Infrared spectrometer
- Multiple site in-situ analysis
  - Repeatability
- Explore different methods for:
  - Sample collection
  - Life detection

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Autonomous Mission

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Autonomous Subsystems

- Onboard GPS and IMU
- Search Pattern
- Trained Neural Network
- Obstacle Avoidance

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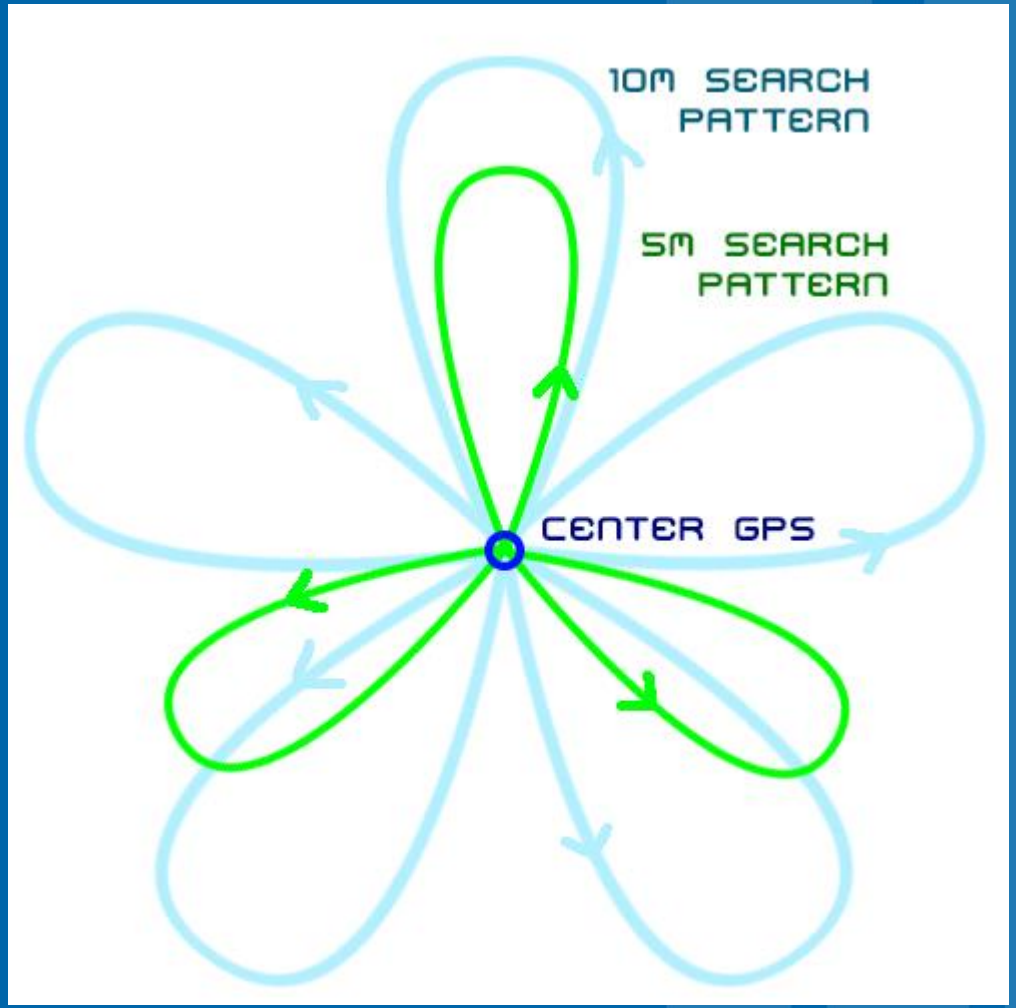
Search Pattern



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Neural Network

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Obstacle Avoidance collab with Melbourne Space Program

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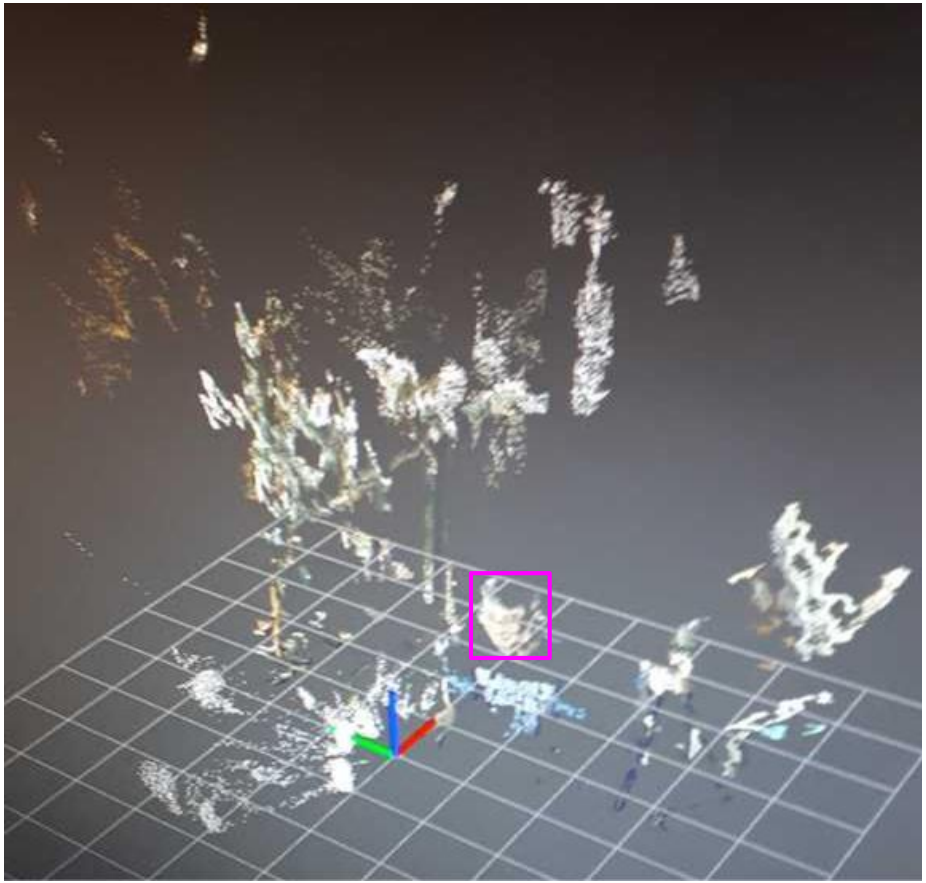

MELBOURNE SPACE PROGRAM

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Autonomous Mission - Opportunities

- Improved obstacle avoidance
  - LIDAR, camera vision
- Object recognition at greater distances (10m+)
- Search pattern optimisation
- Accurate GPS readings

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Thanks for listening!