

Project ID:		Client:	Marc Carmichael
Project Title:	Space Resources Prospecting Probe	Affiliation:	UTS Rover Team

Description:

The UTS Rover Team is a student led semi-autonomous rover team that competes in the Australian Rover Challenge (ARC) every year, against 20+ teams from around the world. The 'Space Resources' Task challenges teams to survey a simulated lunar site, find samples of icy soil and ilmenite enriched soil and determine the concentration of ice and ilmenite in the respective samples.

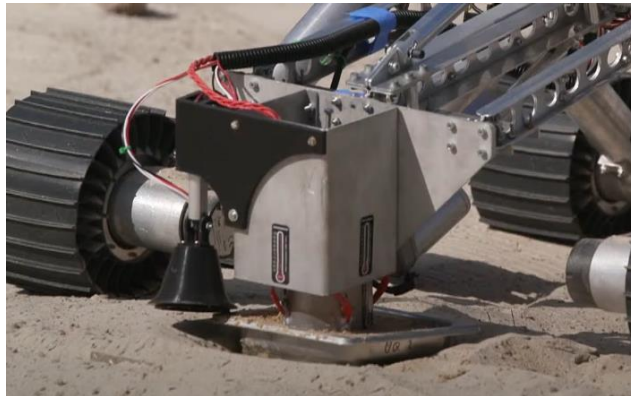
Ilmenite Prospecting: ilmenite is a titanium-iron oxide which can be detected through a range of means. Points are awarded for accuracy of determined ilmenite percentage in the samples.

Icy Soil Prospecting: 2 frozen soil samples will be present in the simulated lunar site, your team will be tasked with determining the concentration of ice in these samples through the remote operation of a rover mounted subsystem.

This project has a large focus on prototyping to find an effective prospecting method through understanding the properties of both the ilmenite and icy soil samples. Possible solutions could involve measuring the conductivity of samples, measuring the magnetic properties of the ilmenite, utilising the difference in mass between the ilmenite and soil, and using simple spectroscopy.

Deliverables:

- Extensive prototyping exploration of a range of prospecting methods
- CAD design and drawings of the prospecting probe subsystem and integration with the rover chassis.
- Mechatronics solution for actuating and controlling the subsystem, including electronics and control software.
- Manufacturing – once mechanical design is completed and approved complete manufacturing, testing and validation of system in conjunction with UTS Rover Team.



Skills Required	Not required at all	Might be required	Some experience required	Moderate experience required	Significant experience required
Mechanical engineering				X	
Mechatronic engineering				X	
Electronics			X		
Programming			X		
Hands-on manufacturing				X	
CAD (e.g. Solidworks)				X	
Artistic Design	X				