Project ID:		**Client:**	Marc Carmichael
Project Title:	UTS Rover Team Multi DoF Manipulator	**Affiliation:**	UTS Rover Team

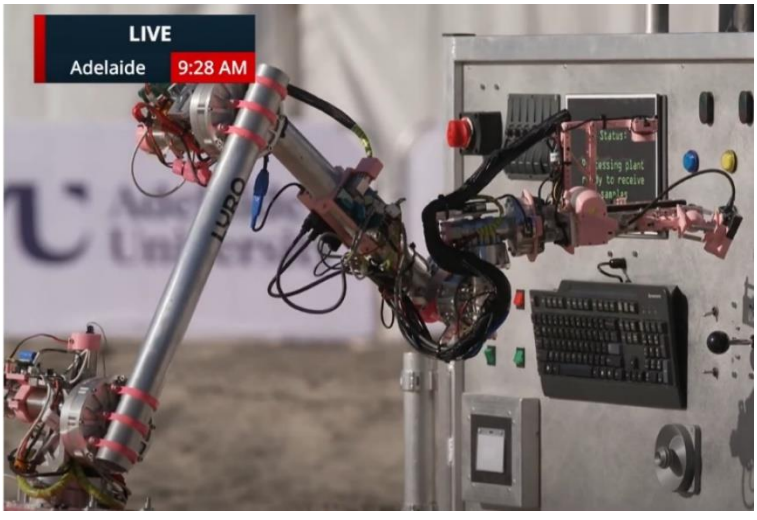
Description:

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 competition is broken into 4 tasks, the 'Post Landing' Task requires teams to precisely interact with a keyboard, buttons, switches, dials, and hose connections.

This DMMS project aims to solve this task for the rover team through the design and manufacture of a multi degree of freedom manipulator mounted to the rover platform the team has developed.

This project expands on skills already developed through Industrial Robotics, Robotics Studio 1 and 2, and Mechanical Design Fundamentals Studio 1. Your team will be tasked with the mechanical, electrical, mechatronics, control, and programming elements of a fully custom robotic arm, that is teleoperated by human operators at a precision level of <5mm.

A critical part of this project is ensuring that human control is as easy as possible, as such inverse kinematics must be used to facilitate rover oriented xyz control of the end effector. The motors for this project have already been acquired and must be used in the design. The mechanical design shall be impact resistant and resilient to withstand the high-pressure competition environment



Deliverables:

- Full CAD design of full manipulator including rover platform mounting
- Control Scheme for human operation likely using Xbox controller or similar
- manufacture, assembly and testing of entire manipulator

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**				

Additional desirable skills/interests:

Inverse kinematics, brushless motor control systems, electronics wiring