

Mars rover Team Mentor (IIT Bombay)

My Role:

I mentor a team of students at IIT Bombay who are designing a rover for the University Rover Challenge. I assist them in selecting manufacturing processes and guide them on design for manufacturing and assembly (DFMA). Additionally, I provide insights into the limitations of various manufacturing processes.

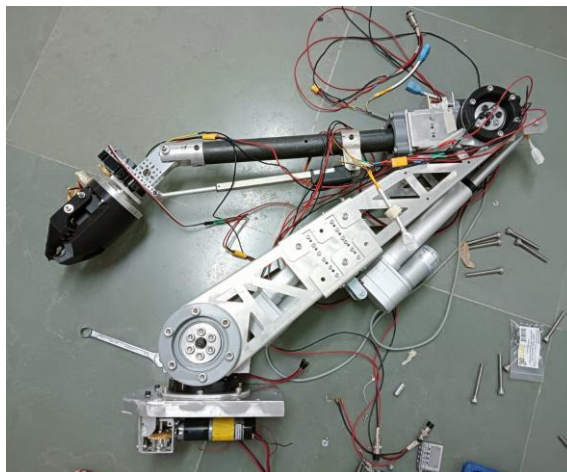
Problems and Solutions :

- The coupling connecting the D-bore shaft of the motor, which drives the wheel, was experiencing wear and failure due to the high torque generated by the motor.
- The coupling was made from aluminium casting, while the motor shaft was made from hardened alloy steel. The main challenge in manufacturing this coupling was that conventional machining methods were not suitable for accurately machining the D-bore to the required tolerances.
- To address this, I guided the team through the design and manufacturing process. I suggested splitting the coupling into two parts, with one part made from surface-hardened material to prevent damage from the sharp corners of the D shape.
- I also leveraged my industrial connections to have the parts manufactured using wire cutting and designed a locating fixture for precise assembly. Additionally, I assisted them in designing the gear system for the robotic arm.

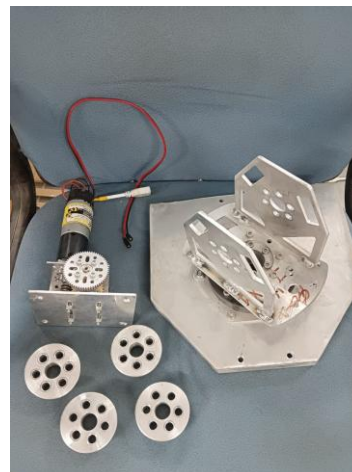
Trans Mars rover for University Rover Challenge 2023:



Robotic Arm made from Sheetmetal to make it lightweight :



Rover Rims made from Sheetmetal using a fixture to make it lightweight :



D Bore Coupling:

