The 2024-25 COSMIC Capstone Challenge

SAN DIEGO STATE UNIVERSITY

ASTELAR

Meet The Team

Aerospace Engineers

Project Manager
Trajectory Design Lead – Sierra Kocina

GNC Lead – Liyou Tesfaye

Communications Lead – Julianna Molina O'brien

Launch Systems Lead – Tzu – Jen Su

Mechanical Engineers

ME Lead
Structures Lead – Hector Hernandez

Payload Lead – Fred Ferreiro

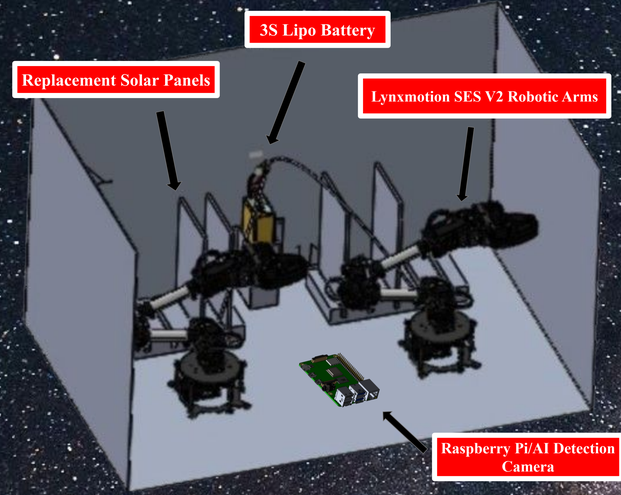
Propulsion Lead – William Fischer

Power Lead – Mayhardona Narsie (MD) Daniel

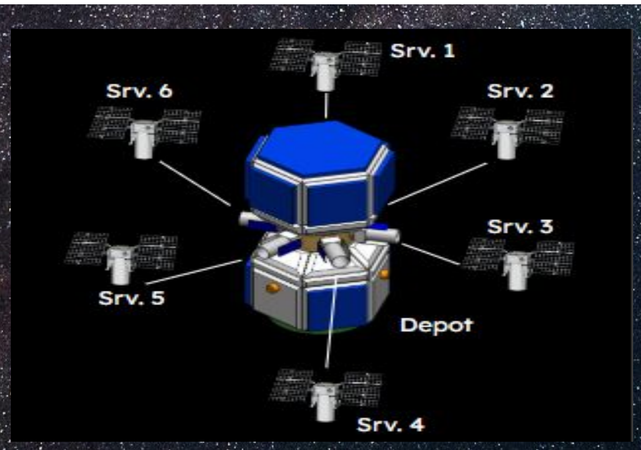
Project Overview

Space debris orbiting our planet's gravitational field is an ever growing problem, as satellites get decommissioned and forgotten about. The Cosmic Capstone Challenge presented a theoretical challenge to find a solution for geosynchronous orbit satellite maintenance and repair possibilities. The prototype displayed serves to act as a miniature replica of what a life-sized servicer satellite would be. It uses an AI software camera in order to detect damage, and utilizes robotic arms in order to carry out set procedures to repair/replace broken and damaged parts. The servicer satellite is apart of a larger HUB of satellites, including a harvester, and home pod.

Final Design



AE Satelite HUB



Acknowledgements

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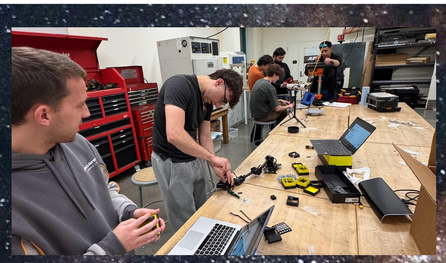
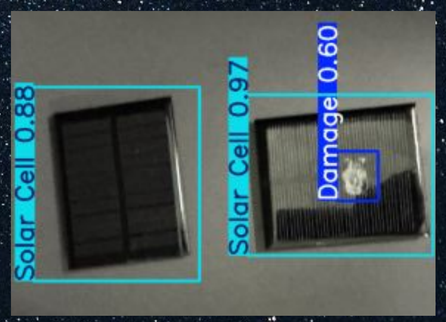
Manufacturing

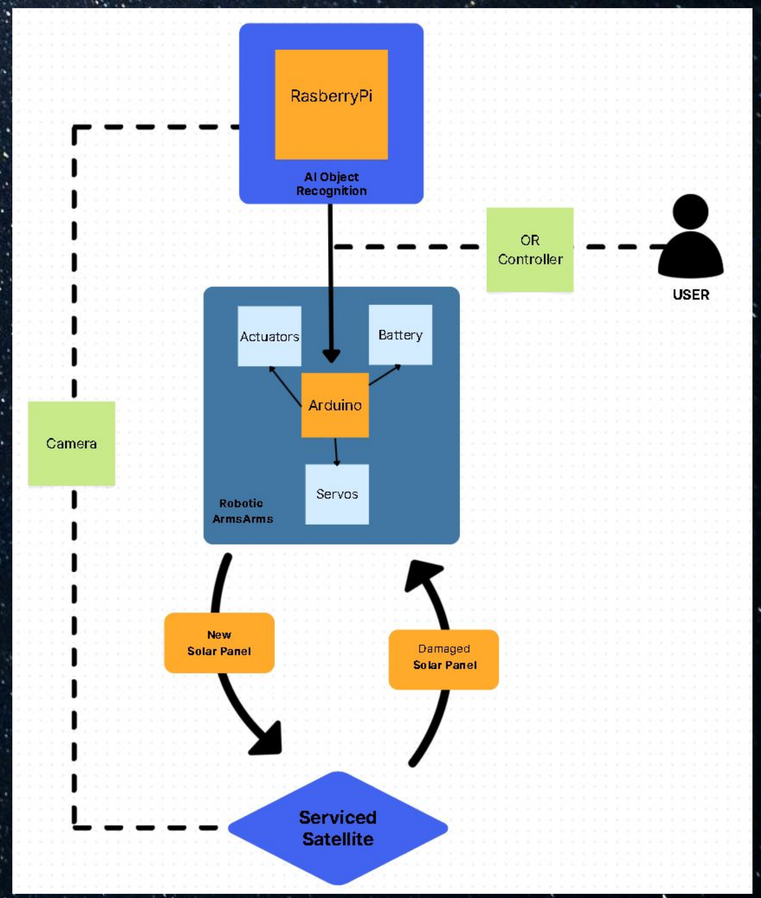




Meet The Sponsor

Cosmic, stands for Consortium for Space Mobility and ISAM Capabilities. This program is a nationwide coalition working to invigorate a domestic in-space servicing, assembly, and manufacturing (ISAM) capability. Cosmic's vision is to create a nationwide alliance that enable the U.S. space community to provide global leadership in ISAM. Cosmic also enable the transition of ISAM to utilization, so that it becomes a routine part of space architectures and mission lifecycles.

System Level Diagram



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