EE/CprE/SE 491 WEEKLY REPORT 06

10/16/2024 – 10/24/2024

Group number: 9

Project title: Space Cyclones - COSMIC CAPSTONE CHALLENGE 2024-2025

Client &/Advisor: Bo Varga, Benjamin Rupp, Rachel Shannon

Team Members/Role: John Beuter (Team Lead), Daniel Sprout, Maheeka Devarakonda, Tanvi Mehetre, Riley Heeren, Ben Swegle

- **Weekly Summary**

Week Objectives: Isolate a single use for nets and conduct research on how nets could be utilized for ISAM capabilities.

- **Past week accomplishments**

• John Beuter: Researched anti-satellite weapons. Conducted research on what projects in the past have utilized nets to capture and mitigate the problem of space debris. I discovered that anti-satellite weapons are a huge threat that the DOD is actively trying to develop counter measures for.

• Daniel Sprout: Initially did research in data transfer use cases focusing on cybersecurity. After topic was isolated to nets brainstormed ideas to allow for net reuse.

• Maheeka Devarakonda:

Conducted research on antenna replacement. Worked on the EE4910 deliverables. Researching types of glass materials for potential shield idea to protect the satellite from lasers.

• Tanvi Mehetre:

Worked on the design document for the project and looked over the net ideas and implementations.

• Riley Heeren: Work on EE 491 documents and deliverables. Brainstorm net material ideas and applications. Brainstorm net deployment systems.

• Ben Swegle:

Worked on deliverables for EE 491 and researched further on the removeDEBRIS net design and deployment mechanism.

- **Pending issues** *(If applicable: Were there any unexpected complications? Please elaborate.)*
  - John Beuter: N/A
  - Daniel Sprout: N/A
  - Maheeka Devarakonda: N/A
  - Tanvi Mehetre: N/A
  - Riley Heeren: N/A
  - Ben Swegle: N/A

- **Individual contributions**

NAME	Individual Contributions	Hours this week	HOURS cumulative
John Beuter	Collaborated with an industry mentor to identify areas of improvement within the team and potential application of nets in space to prevent anti-satellite weapons.	3	9
Daniel Sprout	Brainstorming Net Designs tailored to re-use.	2	13
Maheeka Devarakonda	Conducted research on antenna replacement. Worked on the EE4910 deliverables.	1.5	16
Tanvi Mehetre	Looked over past implementations of nets and worked on the design document.	1	13
Riley Heeren	Look into net materials and deployment systems.	0.5	8
Ben Swegle	Looked further into the removeDEBRIS net deployment mechanism	0.5	8

- **Plans for the upcoming week:**

  Research net materials and deployment mechanisms. Begin designing a net deployment mechanism.

- **Summary of weekly advisor meeting:**

Nets used as a sort of satellite shield could be a useful application. Look into the materials and mechanisms needed and start designing a net launch and retraction mechanism.