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# Overview & Background

Space ISAC analysts monitor satellite interference worldwide, and our project enhances this effort by developing a web-based tool that organizes open-source data into actionable insights. We created an interactive heatmap to visualize interference events and distinguish between benign and malicious activity. By automating data collection and classification, our tool helps analysts quickly understand the nature, location, and threat level of interference, improving response times and supporting decision-making in the space community.

## Work Summary:

#### Web Scraping:

- Using a list of websites and keywords from ISAC, we built a Scrapy-based web scraper to search for specific terms.
- The scraper extracted occurrences of each keyword from the webpages, counting appearances and identifying sources.
- The collected data was compiled into a CSV file, with each row containing the keyword, its frequency, and the webpage on which it appeared.

### **Open Al**

- Start with the list of URLs taken from the web scraping team's keyword search
- Use Open AI model as our generative AI to parse the article and extract data (Date, Location, and Summary)
- This data helps the Space ISAC team determine if a given event is worth studying

### **Text Prompt Engrg**

- Main component of the project
- Used for the keywords: country/location, date and

\*\*Core Details:\*\*

- \*\*Location:\*\* Taiyuan Satellite Launch Center, China (Approximate coordinates needed, no
- of Event:\*\* November 13, 2024, at 2242 UTC (5:42 PM Eastern). This event occurred approximately [Calculate time difference from current time] ago. \*\*Additional Details:\*\*
- \* Date: November 13, 2024
- \* Location: China \* Type: Satellite Launch (Oceanography

#### \*\*Heat Mapping Data:\*

- \*\*Occurrence 1:\*\*
- \* Date: November 13, 2024
- \* Location: Taiyuan Satellite Launch Center, China (Longitude/Latitude needed) \* Type: Satellite Launch \* Summary: Successful launch of Haiyang-4 oceanography satellite
- Work Cited:
- [1] <u>https://sparta.aerospace.org/</u>
- [2] <u>https://attack.mitre.org/</u>

[3] Willbold, Johannes, et al. "Space odyssey: An experimental software security analysis of satellites." 2023 IEEE Symposium on Security and Privacy (SP). IEEE, 2023.

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- NLP Classifier Module: Multiclass-multilabel classification using SVM for • TTPs classification based on SPARTA and/or MITRE ATT&CK Framework
- Dataset Generation to increase prediction accuracy of new incidents
- Heat mapping Module: To visualize the locations of malicious causes
- Summarization Module: To generate a human-like text summarization given these inputs with all relevant information needed

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is hosted so only authorized users can access the heatmap

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## Data Mine of the Rockies Spring 2025

## Dan Hirleman Jessica Jud

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