ArtemiS3

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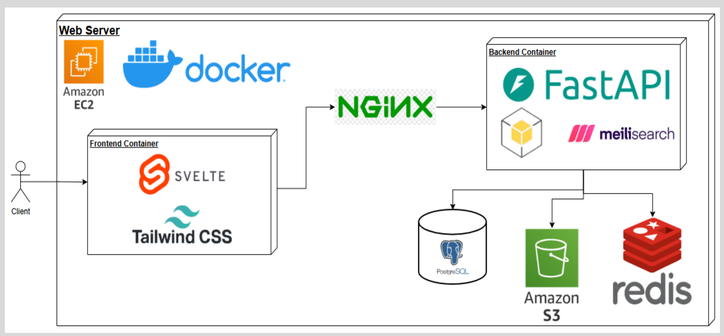
Background

- The **Astrogeology Science Center**, part of **USGS**, provides support for several **NASA** satellite and robotic planetary missions.
- They also **support the infrastructure** required to **archive** and **serve** the data to scientists, students and the public.
- To be able to handle this data, they use **AWS S3 cloud storage**.

What is the Problem?

- **NASA** and the **USGS Astrogeology Science Center** store **many petabytes** of planetary mission data in AWS S3 buckets.
- Currently, researchers must browse folders through a simple S3 browser with **no global search** or **filtering**.

Our Proposed Solution



- **ArtemiS3** is an intelligent web-application designed to **index**, **search**, and **visualize** publicly accessible NASA and USGS AWS S3 buckets.
- Our solution will be a web-app utilizing **Svelte** and **Tailwind CSS** for the frontend UI, Python's **FastAPI** for the backend, fully **Dockerized** and hosted on an **AWS EC2** instance.
- Python's **Boto3** module will be used to access NASA and USGS's AWS S3 bucket storage, and **Meilisearch** will be used as the search engine.
- **Redis** will be used for hot-path caching and rate control, and **PostgreSQL** will store user data like recent searches and tagged files.

The Vision

An intelligent search tool for AWS S3 buckets

NASA

USGS science for a changing world

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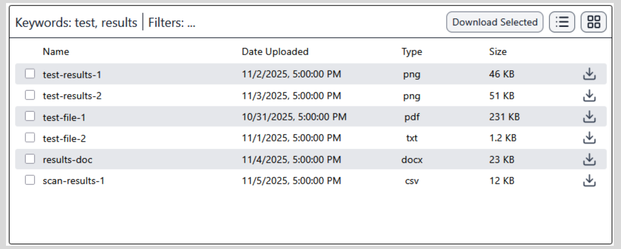
https://www.sce.nau.edu/capstone/projects/CS/2026/ArtemiS3_F25/

The MVP

Key features include:

- Full text and metadata search
- Metadata indexing
- An interactive dashboard
- Using tagging and collaboration
- Caching and rate control
- Administrative security auditing
- Geospatial visualization



Keywords: test, results | Filters: ... Download Selected

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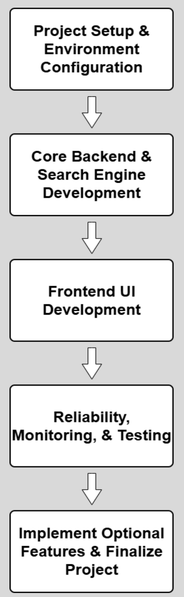
test-results-2	11/3/2025, 5:00:00 PM	png	51 KB
test-file-1	10/31/2025, 5:00:00 PM	pdf	231 KB
test-file-2	11/1/2025, 5:00:00 PM	txt	1.2 KB
results-doc	11/4/2025, 5:00:00 PM	docx	23 KB
scan-results-1	11/5/2025, 5:00:00 PM	csv	12 KB

Technologies Planned

meilisearch · python · amazon web services · Boto 3 · SVELTE · tailwindcss · docker · PostgreSQL

Project Plan & Progress



- We are currently in between the initial project setup and environment configuration, and the core backend development.
- Our functional requirements have been prototyped and will continue to be refined throughout the development process.
- We are confident we can deliver a high-quality product by the end of May 2026.