



# MapONE

One System for Planetary Map Sources

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# Client Overview

- **United States Geological Survey**  
(USGS) Planetary Geologic Mapping  
(PGM) Program
- Organization in the planetary  
science community
- Business: Develop **planetary maps**  
& create tools to share map  
information



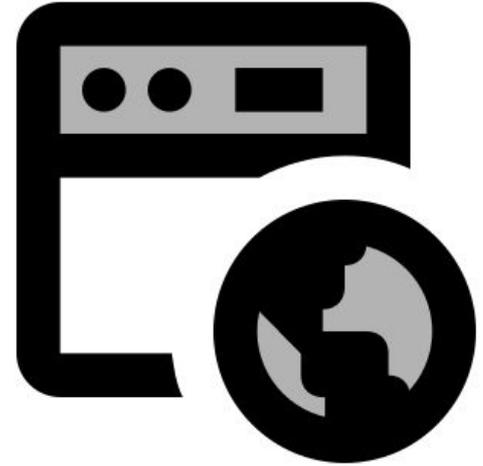
# Problem

- Map publication venues: USGS & **online science journals**
- Journal articles containing maps are **time-consuming** to locate
- **No centralized system** for non-USGS map sources to exist

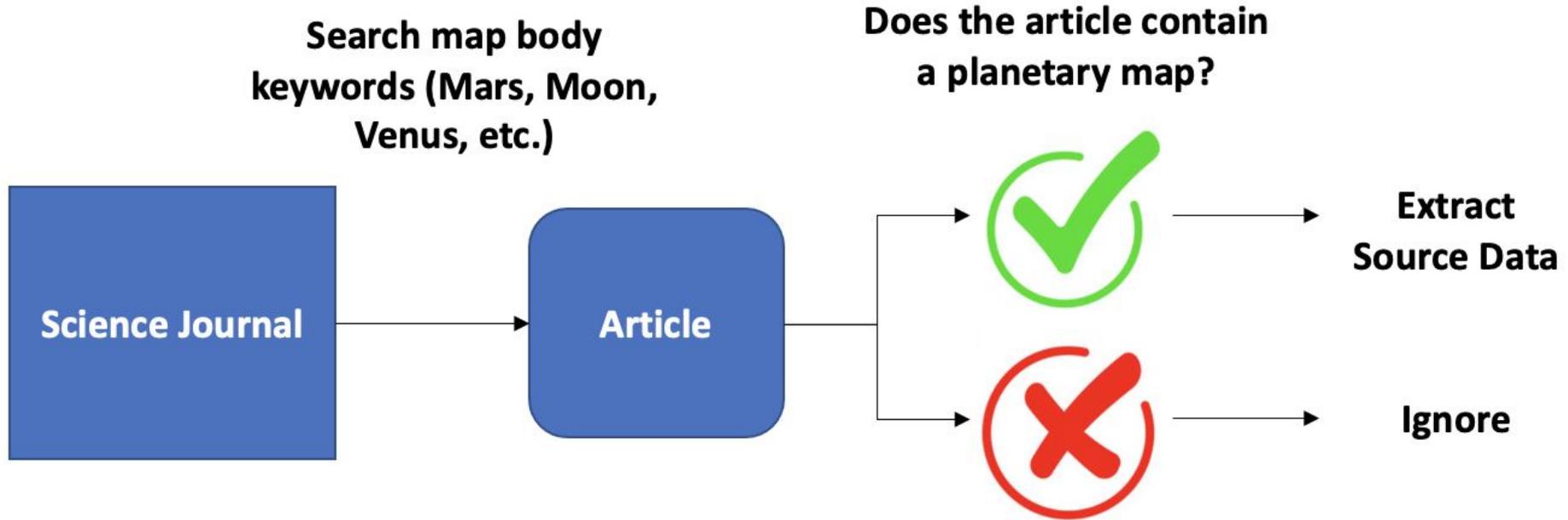


# Solution

- Web application
- Uses a web scraper to **extract source data** from publications containing maps
- User Impact: quickly locates map sources for researchers & scientists

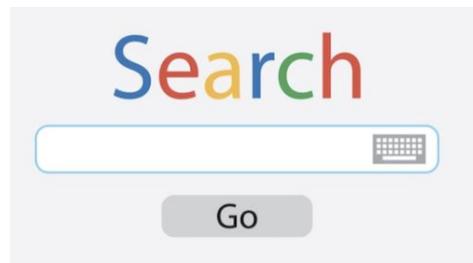
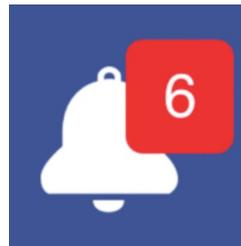


# Web Scraper Workflow



# System Requirements

1. Login into an **account**
2. **View/filter** source data
3. Download article information
4. View/save **search history** results
5. Automate searches
6. Receive **notifications** on new articles



# Software Architecture

## Frontend

- GUI

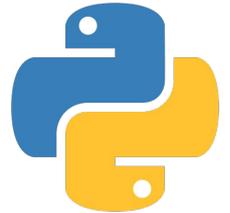
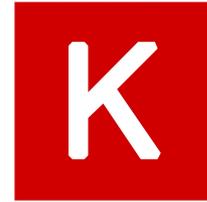


Flutter

## Backend

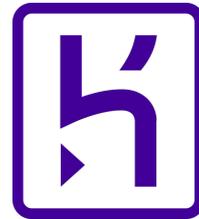
- APIs
- Web Scraper
- Database

django



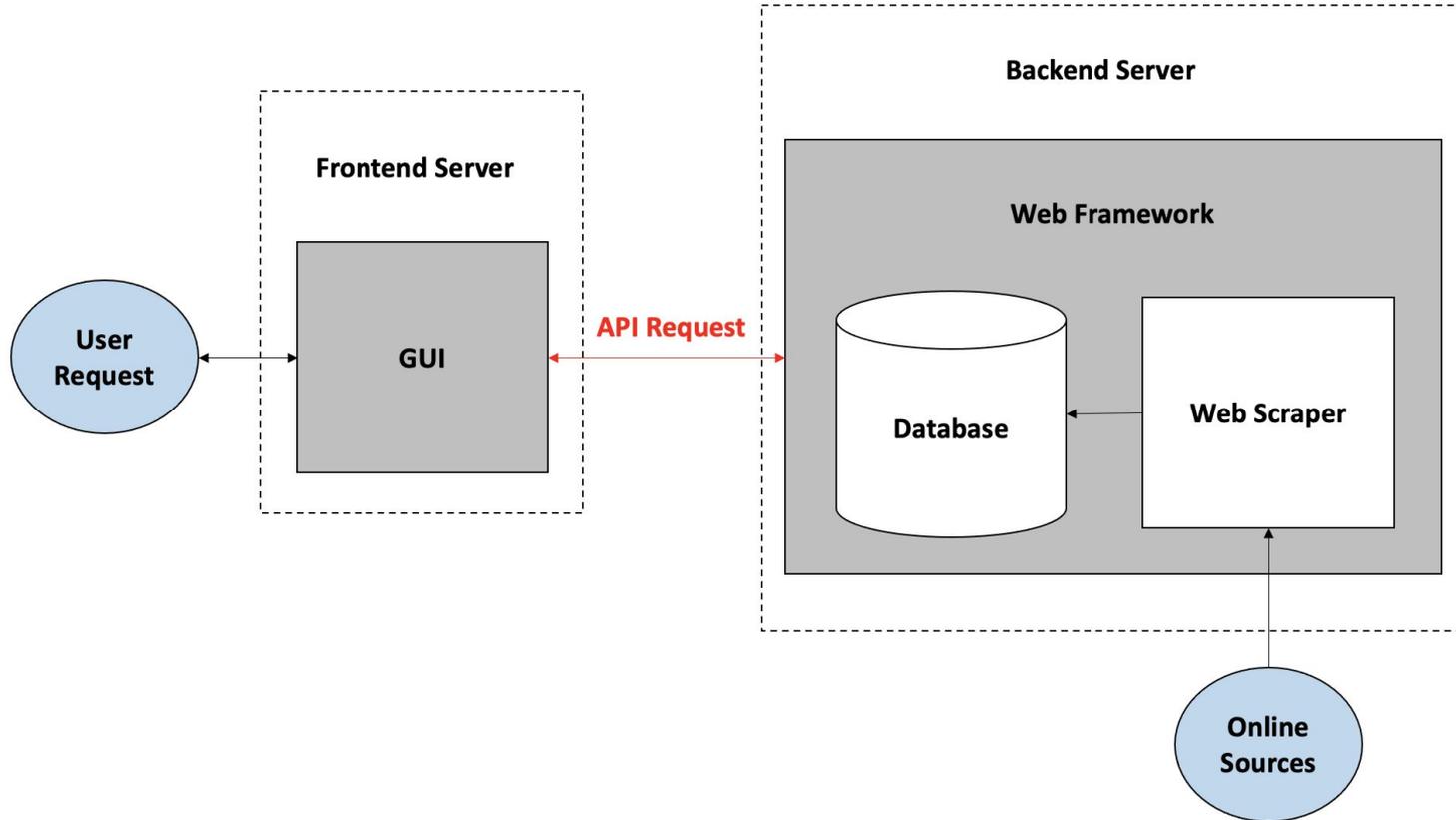
## Hosting Platform

- API calls
- Cloud storage



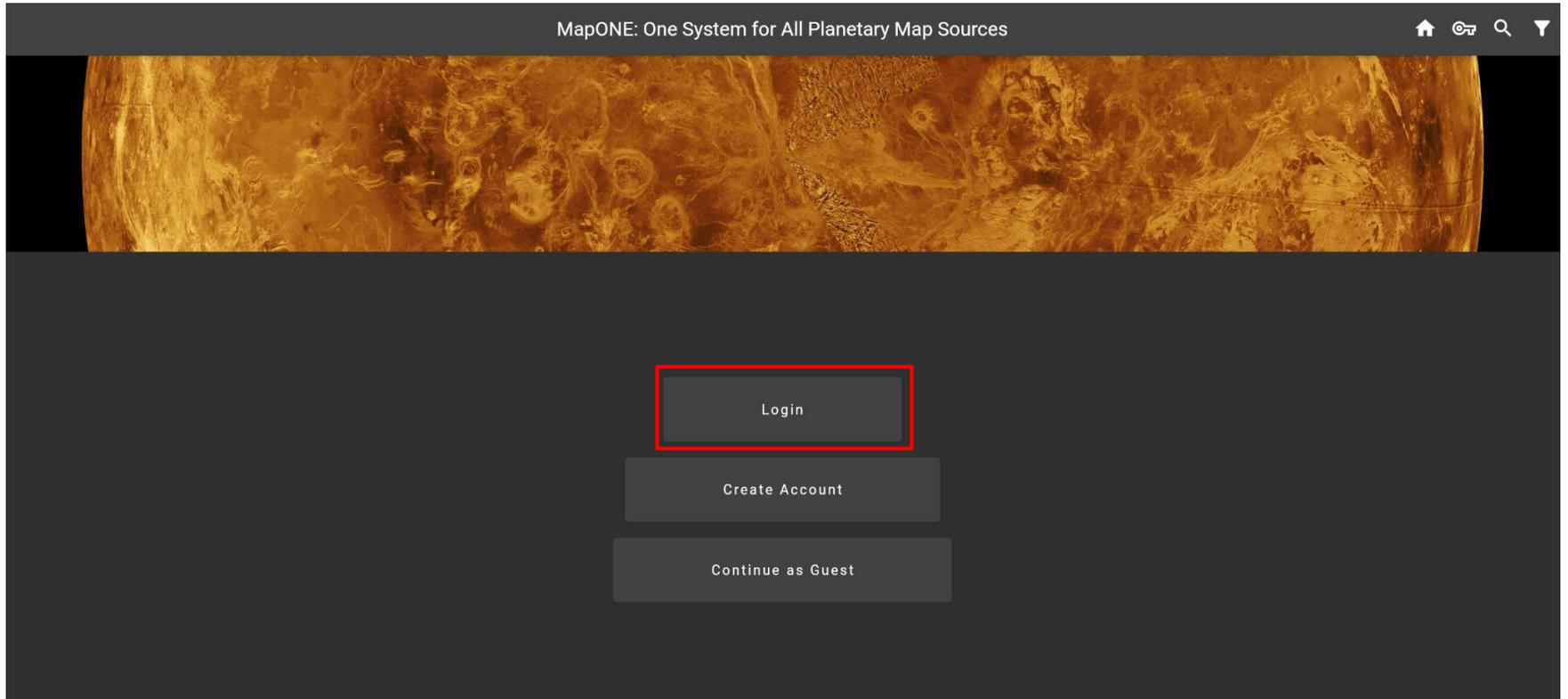
HEROKU

# Software Implementation



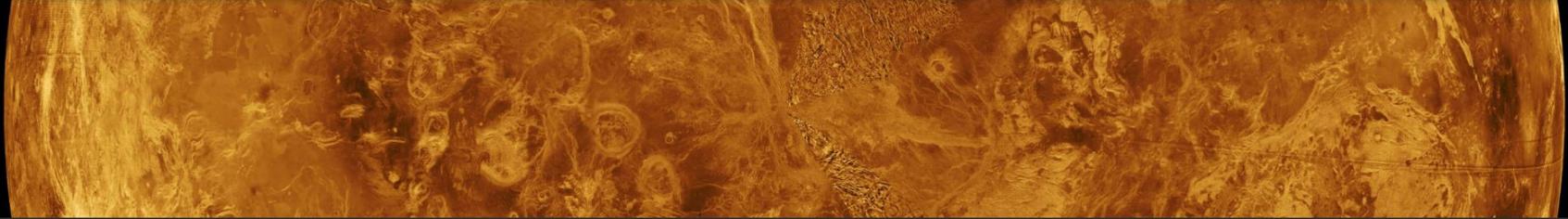
# Prototype Demo

# Use Case: Existing User



# Login Page

MapONE: One System for All Planetary Map Sources



Enter email

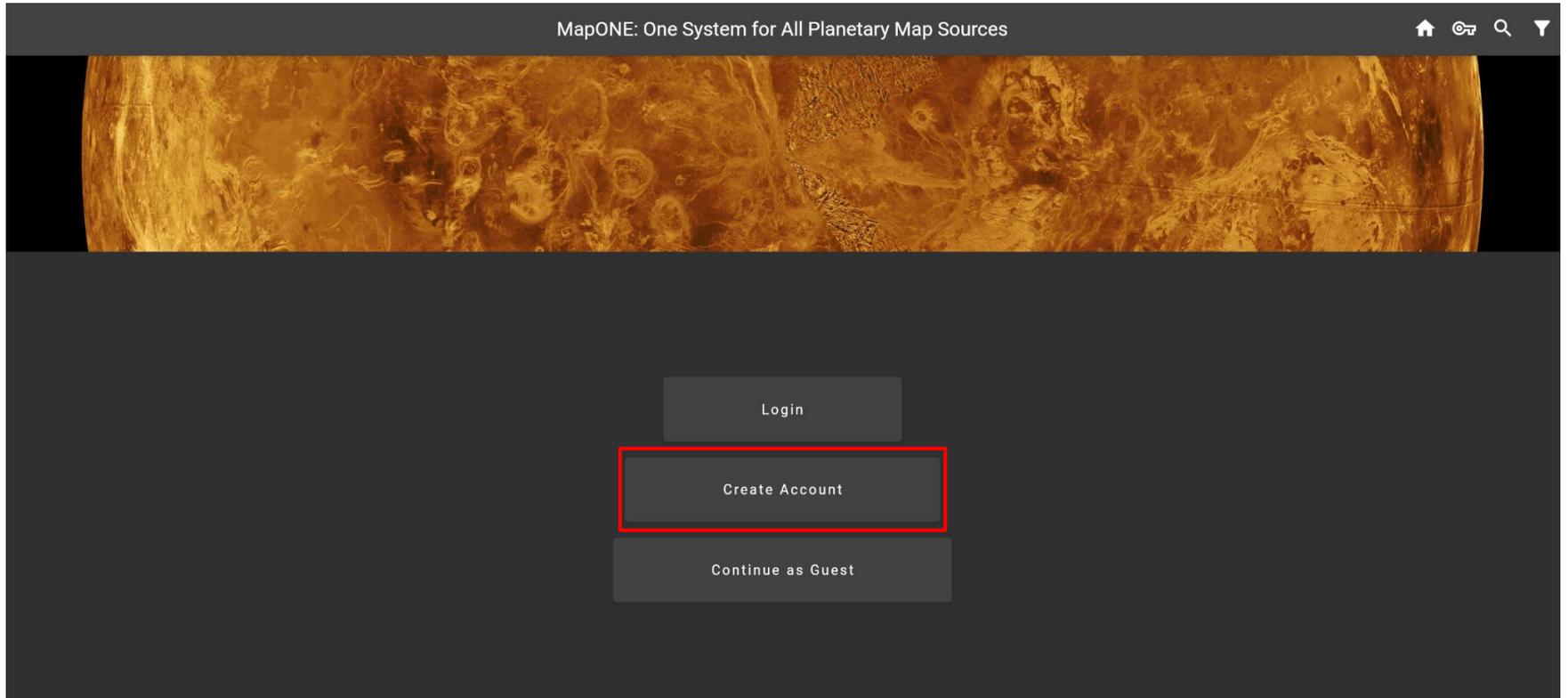
smm885@nau.edu

Enter password

.....

Login

# Use Case: New User



# Create Account

MapONE: One System for All Planetary Map Sources



Enter email

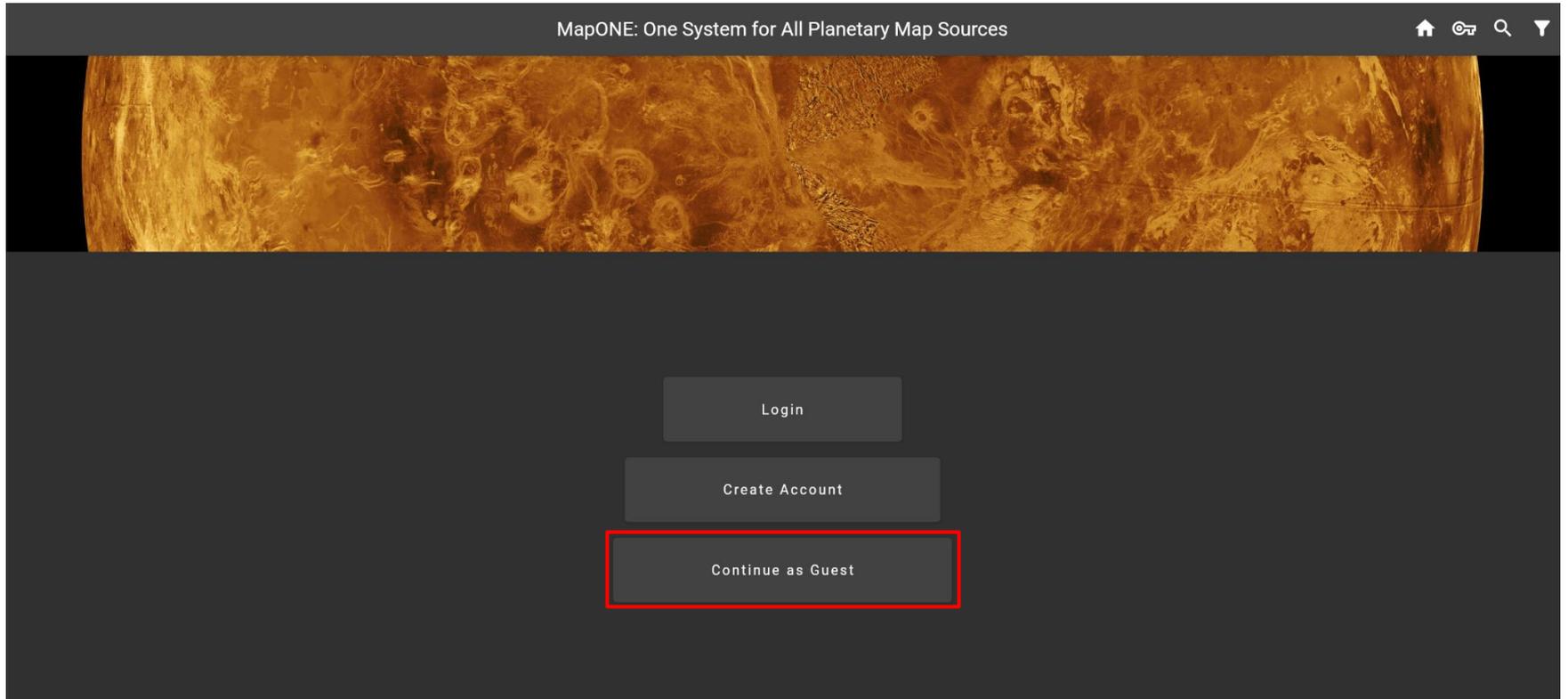
smm885@nau.edu

Enter password

.....

Create Account

# Use Case: Guest User



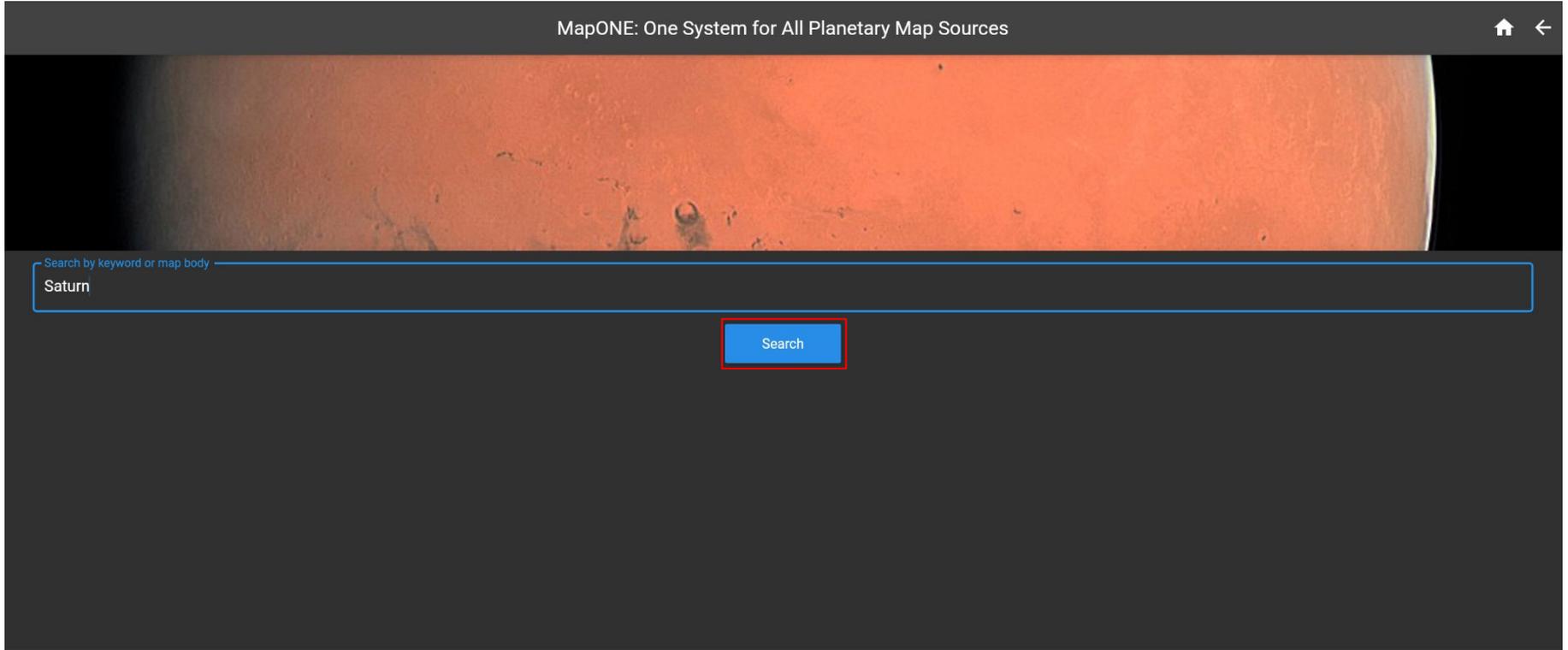
# Main Page

MapONE: One System for All Planetary Map Sources

Export to CSV

Source Name	Source Link	Map Body	Article Title	Author	Publication Date
Springer	<a href="https://link.springer.com/article/10.1134/">https://link.springer.com/article/10.1134/</a>	Jupiter	Observations of the Galilean Moons of Jupiter at Pulkovo in	N. V. Narizhnaya, M. Yu. Khovrichev, D. A. Rikulova	2019-09-25
Springer	<a href="https://link.springer.com/article/10.1007/">https://link.springer.com/article/10.1007/</a>	Jupiter	An Impacting Descent Probe for Europa and the Other	P. Wurz, D. Lasi, N. Thomas	2017-08-01
Springer	<a href="https://link.springer.com/article/10.1007/">https://link.springer.com/article/10.1007/</a>	Ceres	Relict Ocean Worlds: Ceres	Maria Cristina DeÂ Sanctis, Giuseppe Mitri, Julia	2020-05-19
Springer	<a href="https://link.springer.com/article/10.1134/">https://link.springer.com/article/10.1134/</a>	Ceres	Planets, dwarf planets, and small bodies in the Solar	L. V. Ksanfomality	2007-04-01
Springer	<a href="https://link.springer.com/article/10.1007/">https://link.springer.com/article/10.1007/</a>	Ceres	Vesta and Ceres: Crossing the History of the Solar System	A. Coradini, D. Turrini, C. Federico	2011-07-19

# Search by Keyword or Map Body



# Filter By Publication Year

MapONE: One System for All Planetary Map Sources



Start publication year

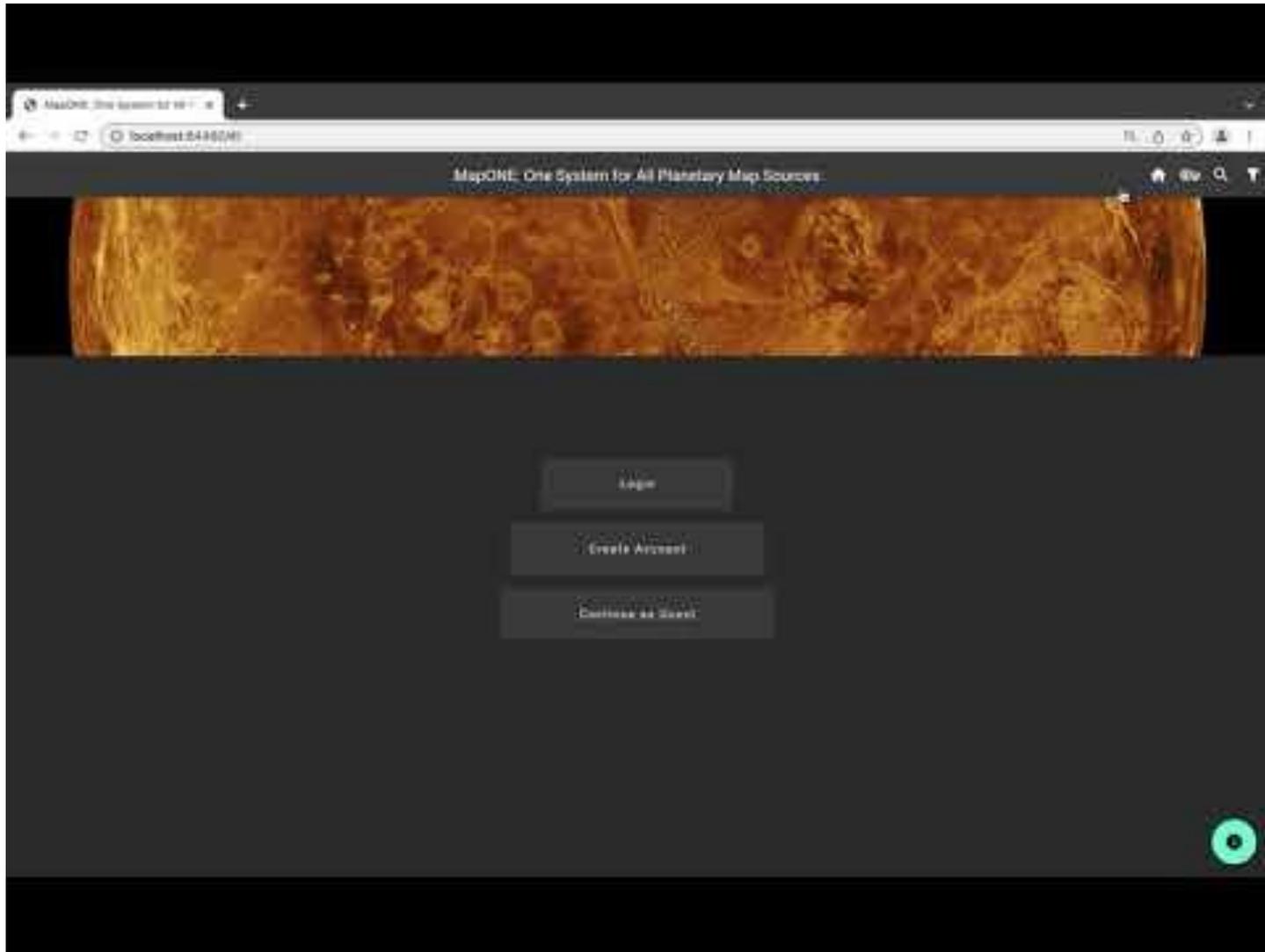
1985

End publication year

1990

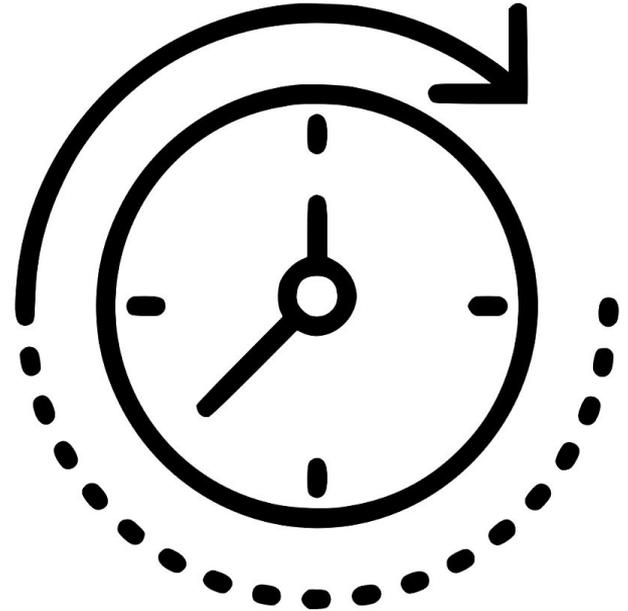
Filter

# Prototype Video



# Challenges & Resolutions

- Update automated searches based on frequency
  - Solution: daily internal timer
- Enabling hyperlinks
  - Solution: Change controller's text state for the URL column using Flutter's OnTap & a decoration widget

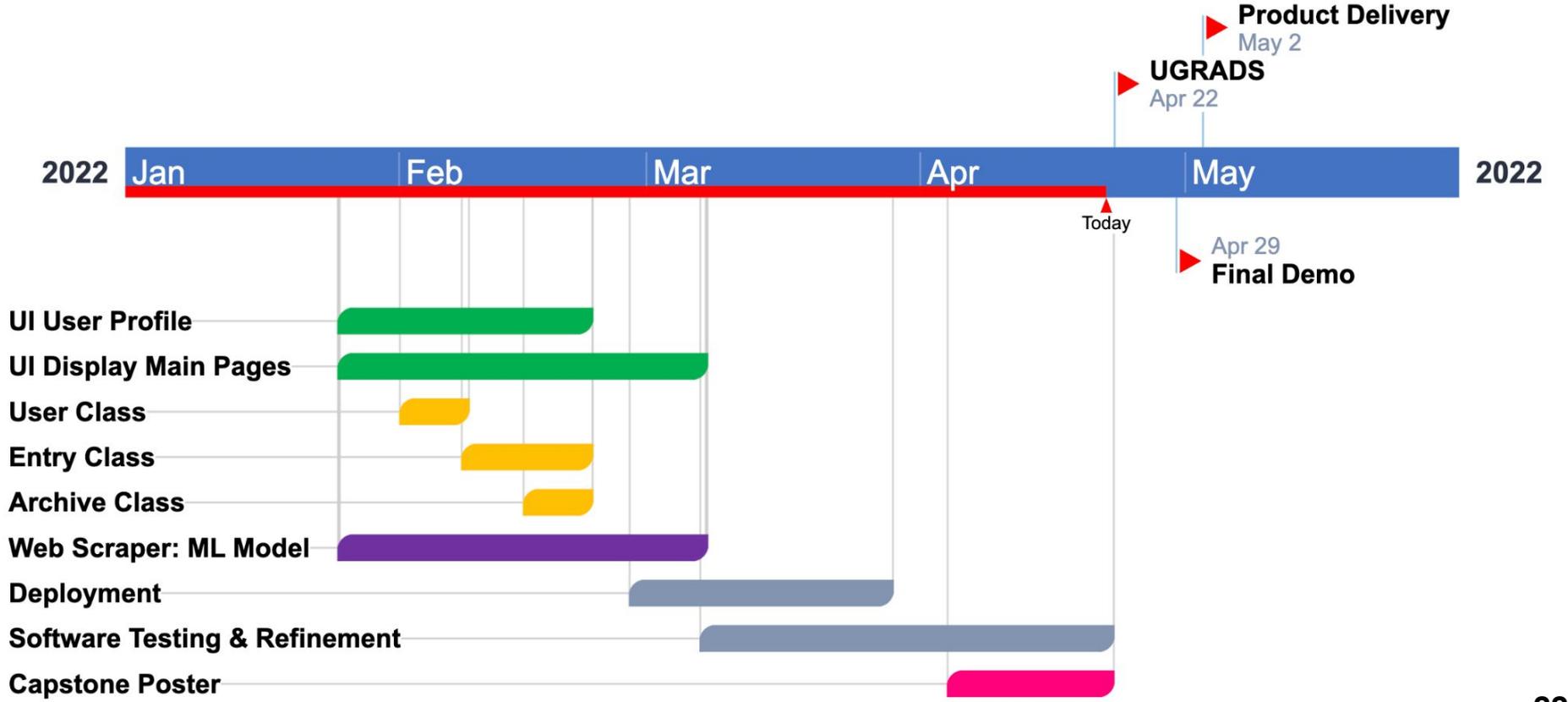


# Testing Plan

- Unit Tests
  - Mock suite for Flutter GUI
  - User, Entry, & Archive class test cases
  - AREPL debugger for web scraper
- Integration Tests
  - API Requests
  - Verify database with scraped articles
- User Study
  - Client survey to gather user responses



# Schedule



# Future Work

As MapONE expands, integrating **community input & validation** is an area for refinement. In the future, users should be able to:

- Add map summaries & related attachments
- Add database entries for maps that did not get detected by automatic searches

# Conclusion

- Team **MapONE**
- **Client:** USGS
- **Problem:** No single platform to access non-USGS sources containing maps
- **Solution:** web application (GUI, API, & web scraper)
- **Overall Impact:** saves time for researchers & encourages community collaboration



# Questions?