

AI-Powered Science Gateway Assistant

Develop an intelligent chatbot that helps researchers navigate and utilize various science gateway tools and resources. This project would combine natural language processing and machine learning to create a user-friendly interface for accessing complex scientific applications.

Target Site: <https://sciencegateways.org>

Brainstorm:

- Logo idea :
 - Snowflake
- UX/UI Interface for the bot
 - Loading symbol while searching
 - Updated artificial intelligence bot where the soft bot offers information based on inferred information
 - Intelligent agent
 - Ingests most recent information from the site
 - Scrapes the site daily??
 - Could provide more relevant information as it approaches gateways conference key dates

Features:

- Better catalog recommendations for related science gateway use for projects
 - Assists in setting up simulations, running parameter sweeps, and debugging code for computational research
- [Maybe] Offer tutorials for using science gateway tools
 - Tool Discovery??
 - Tour Feature for the Science Gateways site
- ~~Creating a user-friendly dashboard (idea: maybe the chatbot is connected to the sgx3 site?)~~
- Integrating a chat collab or file-sharing feature?
 - For similar gateway / paper based on a research document
 - Alternatively can add abstract
- Be able to direct user to other resources if there isn't enough relevant results
- Provide direct link to resources.
- Help the user determine if their contributions are ethical in science gateways.
 - Have black lists of certain information for users
- Provides concise summaries, key findings, and comparisons between related papers.
- [Maybe] Suggests relevant datasets based on research topics, using repositories like Kaggle, Dryad, or NIH Data Commons.
- Able to access multiple scientific article journals, to provide scientific articles for research, with an option of year published.
- Able to produce a mind map for research topics and related papers.

- [Maybe]Validate resource availability
- Increase automate meta data / keyword generation for science gateway objects
- Curriculum development generation
 - Pregenerated prompt to improve verbiage returned for such searches
- Rating and Feedback system
 - Prompt generated listing

Target Audience: Faculty (Researcher and Educators)

- Researchers
 - Students
 - Faculty
 - Industry
 - Scientist
 - International Researchers
- ~~Journal Editors~~
- ~~Data Curators~~
 - ~~Libraries / Librarians~~
 - ~~Databases Admins~~
 - ~~Laboratories~~
 - ~~Researchers~~
 - ~~Industry~~
- ~~Science Gateway Developers~~
 - ~~Industry~~
 - ~~Research~~
- ~~HPC Administrators~~
- ~~Research Validators (Reproducibility)~~
- ~~Grant managers~~
 - ~~NSF~~
 - ~~NIH~~
 - ~~DOE~~
- Educators
 - Faculty
 - Industry
 - K-12
- Students
 - Informal Education Community
 - Higher Education
 - Faculty
 - Developers
 - Operations/IT Administrators
 - Researchers
- ~~Policy Makers and Decision Makers~~

Tools:

- Beautiful Soup (Python Lib)
- Rag model
- Hugging Face - <https://huggingface.co>
 - Ollama-
 - <https://www.youtube.com/watch?v=Wjdr0NU4Sk&t=178s>
 - ChatGPT OpenAI
- Figma