



Facilitating Knowledge Sharing and Discovery: Search Functionality and API Design for the I-GUIDE

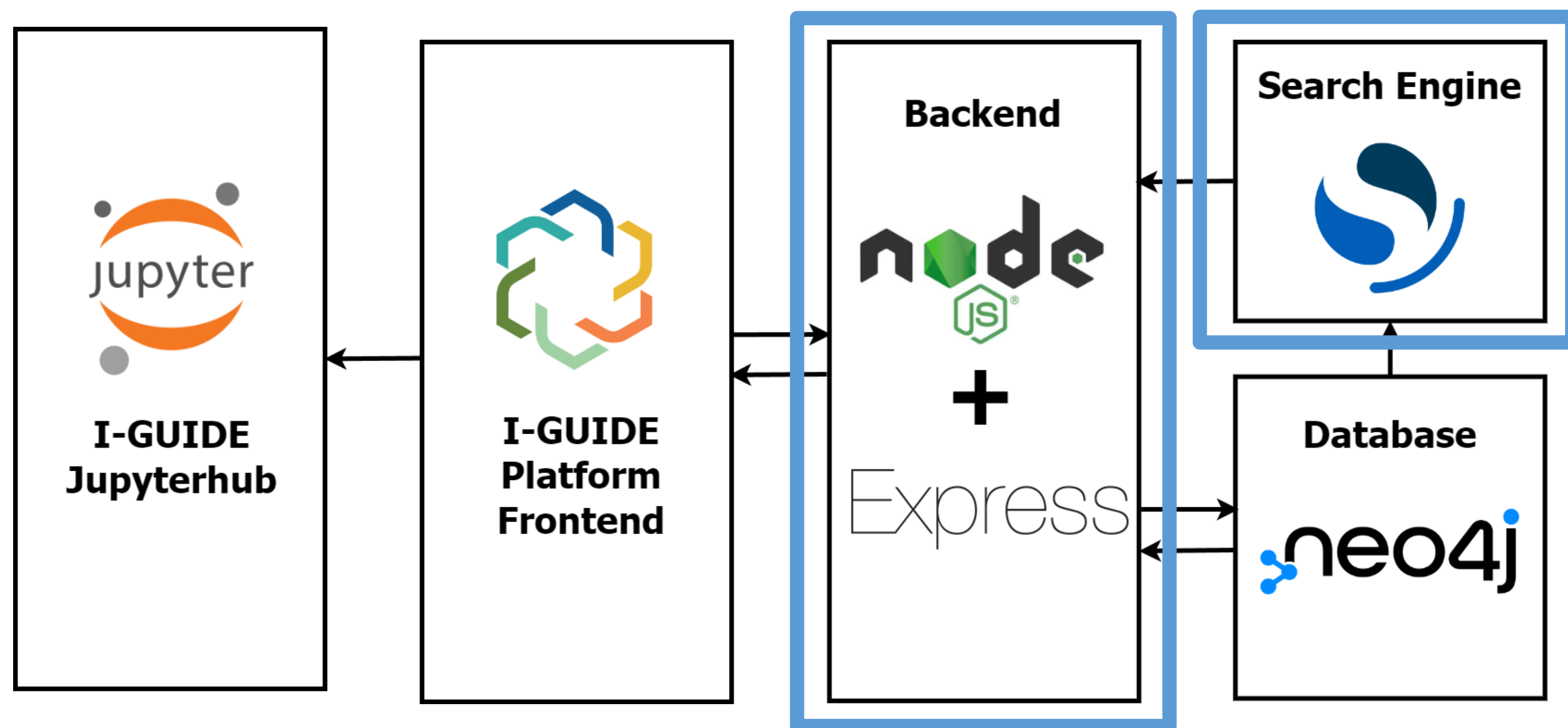


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Abstract

The I-GUIDE platform is designed to facilitate convergence research by providing a scalable and its user environment provides an easy to use interface for knowledge sharing and discovery. This poster presents the platform's technical architecture, focusing on its capabilities and backend APIs that underpin this user environment. OpenSearch powers the full-text and spatio-temporal search capabilities, addressing the challenges of scalability, performance, and ensuring relevance and precision in search results. Express.js and Node.js drive the backend API endpoints, providing efficient query handling, scalability for high traffic loads, and flexibility to adapt to evolving research needs. JWT (JSON Web Tokens) secures and authorizes access to the platform's endpoints, addressing the challenges of robust data security, scalable authorization processes, and seamless integration for role-based permission control. These technical solutions collectively ensure that the I-GUIDE platform's user environment remains a powerful and adaptable tool for supporting extensive, multi-disciplinary research initiatives.

System Overview



Code generation for data accessing

```
Direct Data Access
I-GUIDE Platform Python
from hs_restclient import HydroShare
hs = HydroShare()
hs.getResource('08745ae940ab4433b6f73de6b79088f7', destination='/tmp', unzip=

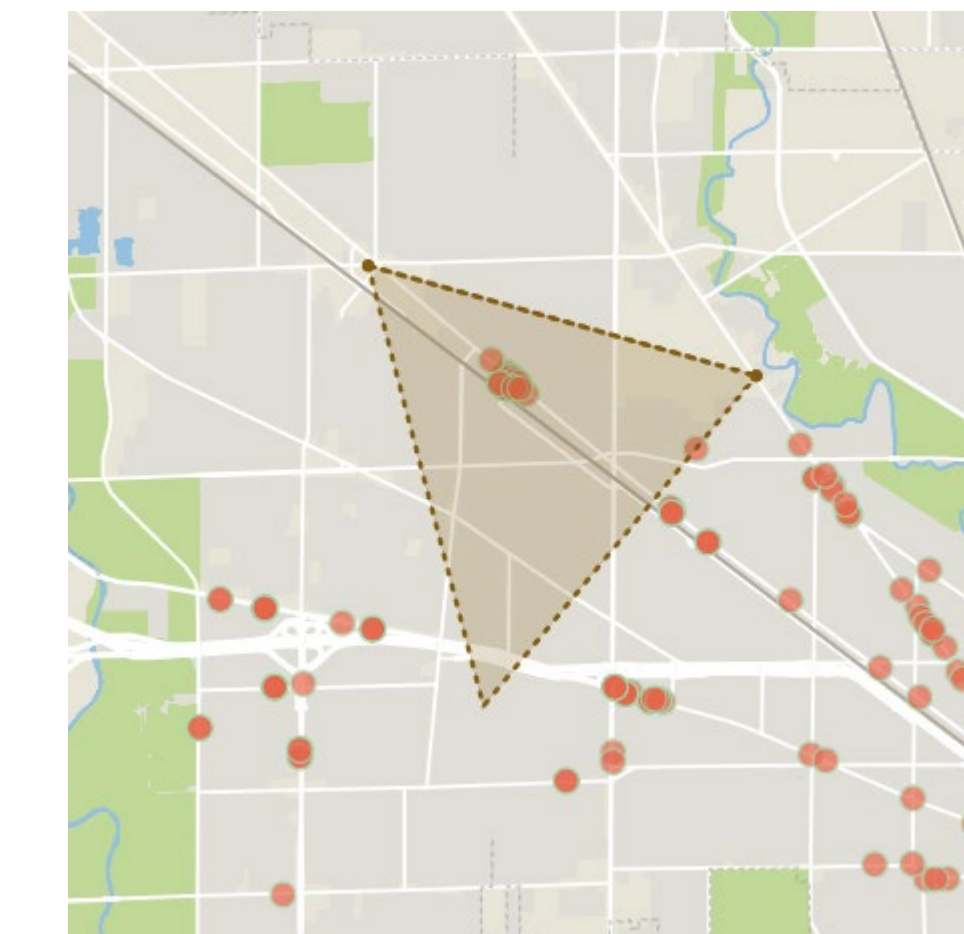
Direct Data Access
I-GUIDE Platform Python
download_to_notebook("twitterjson-210925to210926/twitter_gz/")
```

Scalable knowledge sharing and discovery - Search Functionality

• **Full-text search** with filtering, ranking, and sorting

• **Spatial search**

- Search with (x, y)
- Search with a bonding box
- Search with (x, y) and a distance
- Search with a geopolygon
- Search with a geoshape

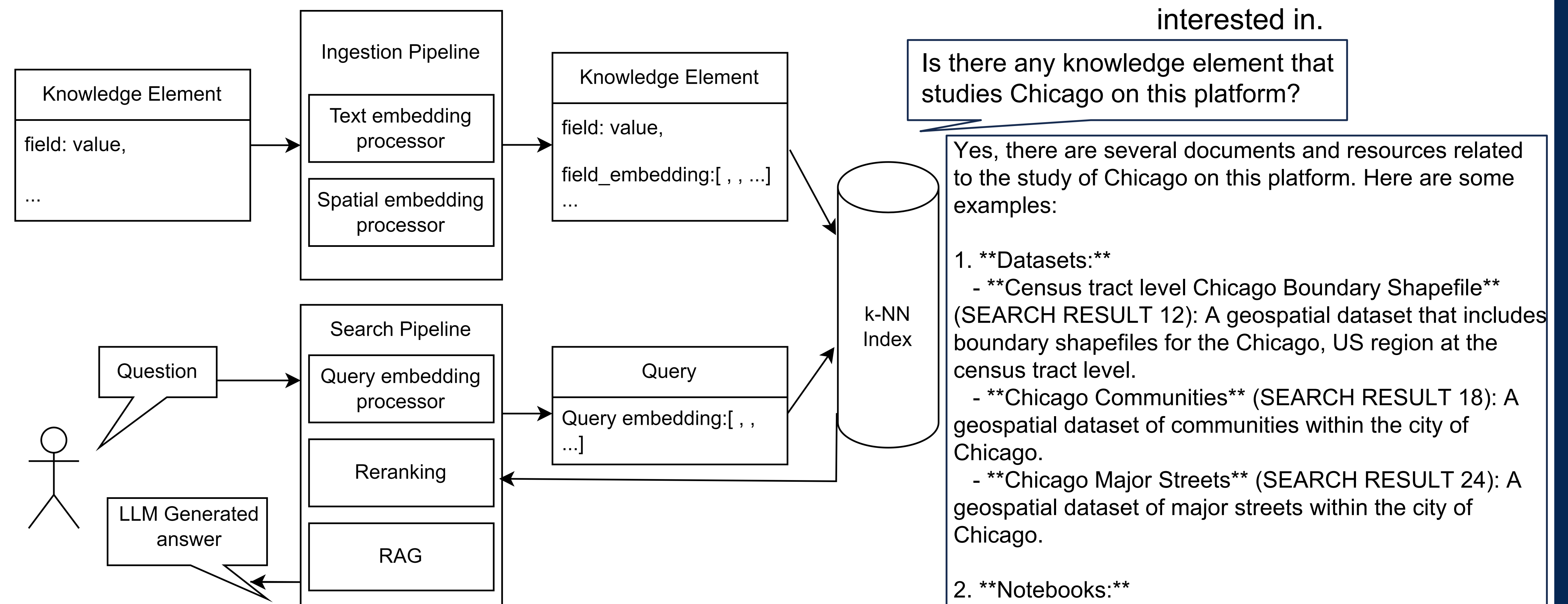


Search the knowledge elements within the polygon



Search the knowledge elements that intersects with the map that I am interested in.

• **Conversational Neural Search**



Security and API access

- OAuth 2.0
- Json Web Token and role-based authorization
- Open API Standard 3.0
- Getting metadata of knowledge elements by id, type, keyword, tag...
- Downloading dataset and notebooks
- Exploring related knowledge elements

Conclusion

- Implemented CyberGIS-Cloud; a web-based middleware framework which abstracts away the details of accessing, utilizing and managing multiple cloud backends.

Future work:

- Library for data accessing
- LLM Search

