



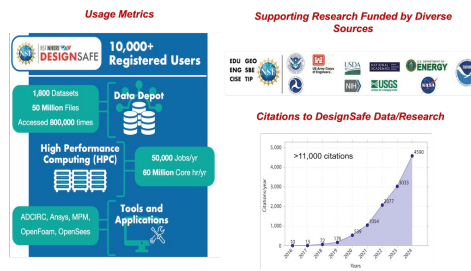
Enabling AI for Natural Hazards Computational Research and Data Publication

What is DesignSafe?

- A web-based research platform that enables transformative research to protect human life/reduce damage resulting from natural hazard events

DesignSafe Vision

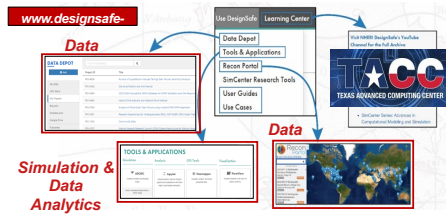
- Foster a cultural shift in natural hazards research towards the pervasive use of cyberinfrastructure and the ubiquitous publishing/reuse of data
 - Provide a platform for data sharing/publishing
 - Enable research workflows and access to high performance computing (HPC)
 - Deliver cloud-based tools that support the analysis, visualization, and integration of diverse data types



Applications

- Dataset curation and publication:** Share data for reuse by the natural hazards research community.
- Computational research tools:** Access to high performance computing for simulation, data analytics, geospatial.
- Virtual community of practice:** researchers with common interests can connect.

DesignSafe Components



Published Datasets

The screenshot shows a detailed view of a dataset in the Data Depot, including its title, description, and associated metadata.

Tools and Applications

The screenshot displays the 'TOOLS & APPLICATIONS' section of the DesignSafe platform, featuring various simulation and analysis tools available for use.

Ask AI chatbot

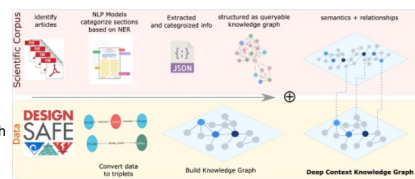
Implemented using Retrieval-Augmented Generation (RAG) framework to improve large language model (LLM) accuracy, this Beta version provides deeper insight into two main areas with separate RAGs:

- Published Datasets:** This RAG is populated from the main landing page content of each published dataset.
- Documentation:** This RAG is populated from the DesignSafe online documentation and also from the SimCenter Tools documentation.

The screenshot shows the AI chatbot interface with search results for 'SearchTraditional', providing relevant information from the DesignSafe database.

AI for metadata extraction

- Access DesignSafe Data Depot using TAPIS API
- Read different file formats (csv / xls) and extract metadata:
 - Column names
 - Value ranges
 - file association
- Push the extracted metadata to a semantic search engine like Neo4j for context-specific searchers
- Example datasets considered:
 - LEAP liquefaction datasets (tsv)
 - Liquefaction CPT data from Maurer (xlsx)



AI Supercomputer Access for Computational Research



Jupyter HPC Native (Vista)

Launch an interactive Jupyter Lab instance on Vista. Your My Data and Work directories will be available within the session.

[Get Started](#)

DesignSafe: We are here for you!

Available to the Global Natural Hazards Research Community

- Interact with us and the community using the DesignSafe Slack team
- Cite data using DOIs in your reference list
- Cite DesignSafe marker paper (Rathje et al. 2017, *Natural Hazards Review*) if you use DesignSafe in your research



Please share your feedback, ideas, experiences!

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NSF Award 2022469

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