GRCResponder

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Problem Statement

- What is a General Rate Case proceeding?
  - Used to address costs of operation and maintenance for utility companies
  - Carried out by the California Public Utilities Commission
- Utility companies need to be able to
  - Manage documents
  - Respond to regulatory inquiries
  - Ensure consistent responses across submissions
  - Meet strict deadlines and compliance requirements

Overview

- **GRC Responder**
  - ChatBot that assists with legal questions related to general rate case proceedings
  - Provides historical examples and supporting documentation to quicken the search process
  - Summarizes key points from lengthy documents

- **Retrieval-Augmented Generation**
  - Given a particular query, be able to find relevant context based on a vector similarity search across all stored databases
  - Pass retrieved context to LLM model in order to form a response to return to the user

Current Status

Web Scraping

- Scraped all proceeding metadata from Utility Commision website
- Capable of individual proceeding document processing and database insertion

To-Do

- Optimizing document collection efficiency while balancing scraper politeness


```
{
    "proceeding_id": "A2504004",
    "filed_by": "Pacific Gas and Electric Company",
    "service_list": [
        "https://ia.cpuc.ca.gov/servicelists/A2504004_97628.htm"
    ],
    "industry": "Electric",
    "filing_date": "April 9, 2025",
    "status": "ACTIVE",
    "category": null,
    "description": "[PUBLIC VERSION] Application of PACIFIC GAS AND ELECTRIC COMPANY (U39E) for a
    Certificate of Public Convenience and Necessity Authorizing the Construction of the S-238
    Hinkley Compressor Station Electrical Upgrades Project.",
    "staff": null
},
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	id	document_id	chunk_text	chunk_metadata
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2	2	2	Document: Application of Southern California Edison Company (U33…	{"filed_by": "SOUTHERN CALIFORNIA EDISON COMPA
3	3	3	Document: Amendment to Test Year 2026 Cost of Capital Applicatio…	{"filed_by": "San Diego Gas & Electric Company
4	4	4	Document: Application of San Diego Gas & Electric Company (U902M…	{"filed_by": "San Diego Gas & Electric Company
5	5	5	Document: RESPONSE TO APPLICATION␝Type: RESPONSE␝Filed By: RSD/H…	{"filed_by": "RSD/HILL/CPUC", "tab_name": "Doc
6	6	6	Document: RESOLUTION ALJ 176-3561. Preliminary determinations o…	{"filed_by": "CALJ/COOKE/CPUC", "tab_name": "D
7	7	7	Document: Application of City of Encinitas to construct two new …	{"filed_by": "City of Encinitas", "tab_name":
8	8	8	Document: Decision D2407039 - Order of Dismissal. Complaint 23-0…	{"filed_by": "-", "tab_name": "Documents", "so
9	9	9	Document: JOINT MOTION TO DISMISS COMPLAINT without prejudice.␝T…	{"filed_by": "Pacific Gas and Electric Company
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11	11	11	Document: EMAIL RULING. In light of recent developments that ha…	{"filed_by": "ALJ/MASON/CPUC", "tab_name": "Do
12	12	12	Document: ASSIGNED COMMISSIONERS SCOPING MEMO AND RULING␝Type: S…	{"filed_by": "CMMR/JOHN REYNOLDS/CPUC", "tab_n
13	13	13	Document: JOINT PREHEARING CONFERENCE STATEMENT␝Type: STATEMENT␝…	{"filed_by": "Edward Freitas,Pacific Gas and E
14	14	14	Document: ADMINISTRATIVE LAW JUDGES RULING SETTING PREHEARING CO…	{"filed_by": "ALJ/MASON/CPUC", "tab_name": "Do
15	15	15	Document: Verified Answer to Complaint.␝Type: ANSWER␝Filed By: P…	{"filed_by": "Pacific Gas and Electric Company
16	16	16	Document: NOTICE OF REASSIGNMENT␝Type: NOTICE␝Filed By: CALJ/Coo…	{"filed_by": "CALJ/Cooke/CPUC", "tab_name": "D
17	17	17	Document: [Answer is due November 1, 2023.]␝Type: INSTRUCTION TO…	{"filed_by": "California Utilities Commission"
18	18	18	Document: Edward and Elizabeth Freitas, Complainants vs. Pacific…	{"filed_by": "Edward Freitas,Elizabeth Freitas

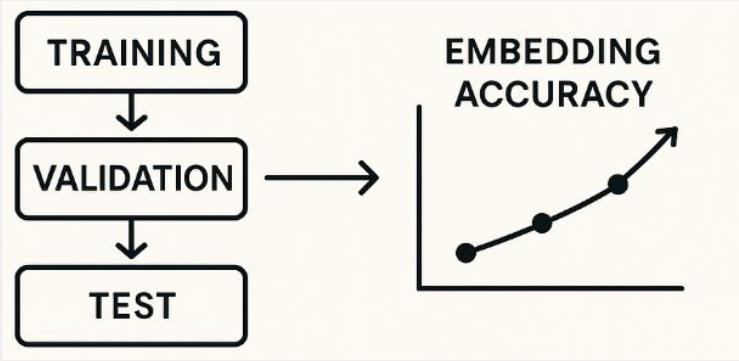
Development Updates

Threading

- To improve efficiency we are experimenting with batch processing and threading
  - Batch size of 3 document cases
  - Operating over 4 threads

Other Focuses

- Creating a validation set for embedding model and query accuracy.
  - Batch size of 3 document cases
  - Operating over 4 threads



Current Status

LLM Integration

- Connected LLM to both local and azure-hosted chroma database
- Performed tests using earlier, available version of web scraper

Evaluation

- Set up initial testing system using more powerful LLM to judge responses

```
================================ Human Message =================================

What documents do you have access to?
================================== Ai Message ==================================
Tool Calls:
  retrieve (60d8d6c8-b2eb-4123-a015-395ab48132ef)
 Call ID: 60d8d6c8-b2eb-4123-a015-395ab48132ef
  Args:
    query: all available documents
Retrieved 2 documents in 2.6690289974212646 seconds.
================================= Tool Message =================================
Name: retrieve

Source: {'chunk_index': 0, 'document_id': 4, 'document_type': 'APPLICATION', 'filed_by': 'San Diego Gas & Electri
Content: Document: Application of San Diego Gas & Electric Company (U902M) for Authority to Establish Its Authori
Type: APPLICATION
Filed By: San Diego Gas & Electric Company
Filing Date: 2025-03-20

Source: {'chunk_index': 0, 'document_id': 3, 'document_type': 'AMENDMENT', 'filed_by': 'San Diego Gas & Electric
Content: Document: Amendment to Test Year 2026 Cost of Capital Application of SDG&E  (U902M) dated March 20, 2025
Type: AMENDMENT
Filed By: San Diego Gas & Electric Company
Filing Date: 2025-03-24
================================== Ai Message ==================================

I have access to two documents:

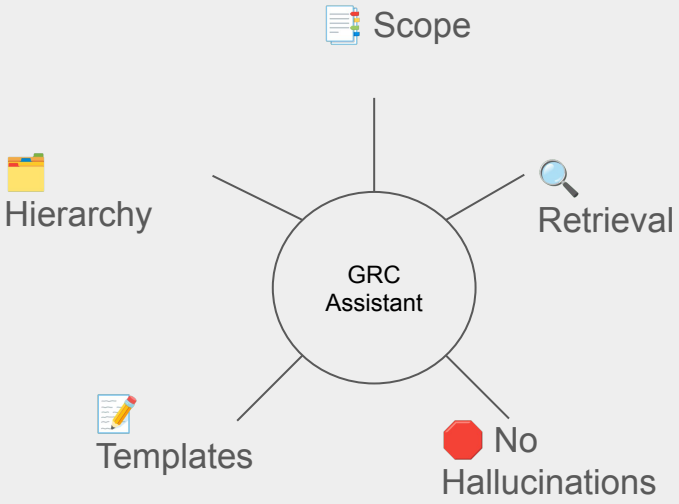
1. An "Application" document with the title "Application of San Diego Gas & Electric Company (U902M) for Authorit
2. An "Amendment" document with the title "Amendment to Test Year 2026 Cost of Capital Application of SDG&E  (U90

Please note that these documents are related to a specific proceeding, with proceeding numbers and IDs. If you're

========================
       LLM + Retrieval call took 39.72 seconds
========================
```

Prompting Azure Chroma DB

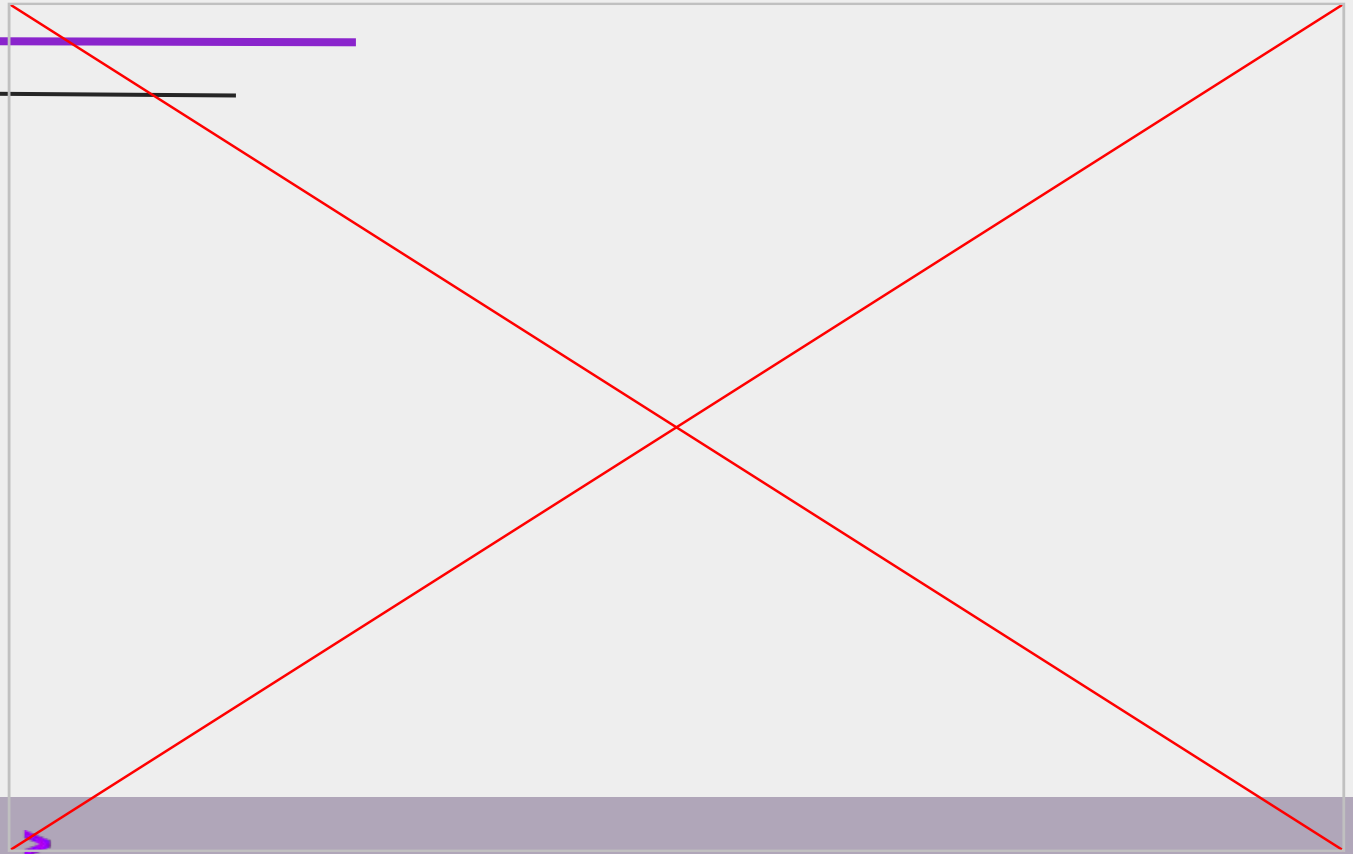
LLM Updates



System Prompt Updates:

- **Scope tightened to CPUC GRC only** – polite refusal for off-topic requests.
- **Explicit three-level evidence order** – *user docs* ➜ *vector DB* ➜ *static memory*; asks follow-ups if data missing.
- **Response templates standardized** – Q&A, consistency table, or draft filing with inline citations.
- **Hallucination guardrails added** – aim to reduce fabricated facts; numerical values cross-checked or flagged “unknown.”
- **Tone & formatting defined** – concise, professional, no jargon; should end with “Need more detail?” prompt.

Current Status



Technical Details

Tech Stack:

- TypeScript with React – frontend
  - PDFViewer - react-pdf-viewer > PDF.js
- Python (FastAPI) – backend
- Microsoft Azure

Document Retrieval:

Semantic Search

- Vector Storage: ChromaDB for text embedding storage and retrieval
  - Used to locate relevant documents used to address user queries

Topic Based Navigation

- postgreSQL: document and proceeding metadata storage
  - Uses GIN indexing to map unique words to text chunks
  - Allows for retrieval of only chunk text containing query words

Technical Details

Local Database Setup

- Web scraper targeted entirety of A.21-06-021 and A.22-04-016
- 1000 char chunks w/ 50 char overlap by default

Evaluation

- Using more powerful LLM for evaluation
- For a prompt to local LLM: save prompt, context, and response
- Ask it to evaluate relevance of retrieved context and how well our local LLM extracted information from provided context
- Exploring possibility of generating a small Q&A dataset on relevant documents

```
================== Prompt 1 ==================                                                    4 ^
PROMPT:
Based on the 2023 Safety Performance Metrics Report submitted by PG&E to the California Public Utilities Commission on April 1, 2024, summarize the
 purpose of this report, what safety metrics PG&E is required to track, how these metrics are used to improve safety performance, and any notable
 safety trends or improvements mentioned in the introduction. Please include information about how these metrics relate to executive compensation and
  risk-informed decision making.

================================== Ai Message ==================================

Based on the 2023 Safety Performance Metrics Report submitted by PG&E to the California Public Utilities Commission on April 1, 2024, here is a
 summary of the report's content:

**Purpose of the Report:**
The purpose of this report is to provide a comprehensive overview of PG&E's safety performance in 2023, as required by California law (Public Utility
  Safety Commission Rule 14, CCR § 1600 et seq.). The report aims to inform the public about PG&E's commitment to safety and its progress in
 achieving its safety goals.

**Required Safety Metrics:**
PG&E is required to track a set of safety metrics, including:

1. Work-related injuries (WRIs) and illnesses
2. Fatalities
3. Near misses (non-fatal injuries or illnesses that could have resulted in a WRi)
4. Environmental releases
5. Electrical fatalities and injuries

These metrics are used to assess PG&E's overall safety performance and identify areas for improvement.

**Improving Safety Performance:**
The report highlights several initiatives aimed at improving safety performance, including:

1. Enhanced training programs for employees
2. Improved fall protection systems
```

Prompting Local Chroma DB

Next Steps…

- **Refine RAG Testing & Evaluation:**
  - Improve retrieval and context usage by the LLM
  - Evaluation metrics:
    i. Search response time < 2 seconds
    ii. Document processing accuracy > 95%
    iii. >90% accuracy in relevant document retrieval
- **Host Project on Azure:**
  - Connect web with LLM and have it hosted on Microsoft Azure.
- **Enhance User Experience:**
  - Polish performance and visuals based on user testing.
- **Research Paper:**
  - Document progress and performance metrics in a research paper potentially catered towards a SAGE journal.

Questions?