Retrieval System for Manga

Track

Development Track

Team members

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Functions and Users

We plan to develop a standalone software tool called a **manga retrieval system based on vague memory queries**. This tool is designed to help users find manga stories they've read before but can no longer recall the exact title or details, by allowing them to input vague or partial memories as search queries.

The major functions of the envisioned tool include:

- **Customizable RAG (Retrieval-Augmented Generation) database based on personal manga collections**: Users can build and manage their own manga library, which will serve as the source database for retrieval during question answering and content search.
- **Manga content understanding and summarization**: The tool will process manga panels, perform segmentation, and generate textual summaries to use as searchable content.
- **Vague-memory-based retrieval**: Users can input natural language queries based on vague or imprecise memories, and the system will return the most relevant manga matches using semantic search and language models.

The primary users of this software are:

- **Users** who faintly remember plots or characters but cannot recall the title or author.
- **Users** who manage large libraries and want a smarter, content-aware tool for organizing and searching their collections.

Significance

Most existing manga search tools only support exact or fuzzy search by title or visual-based image search. However, many users encounter manga casually online—often through a few viral panels or screenshots—with no record of the title or author. These moments are fleeting, and months or even years later, users may struggle to recall what the manga was called or where they saw it. Current tools fail to support such vague, memory-based queries, leaving users to rely on time-consuming manual search methods, such as asking others online or browsing forums in hopes of recognition.

Our proposed tool addresses this significant **pain point** by allowing users to search based on imprecise, natural language descriptions of what they remember—fragments of plot, emotions, or visual elements—rather than relying solely on titles or images.

This tool has the potential to change how people engage with media they've partially forgotten. It bridges the gap between **personal memory and content discovery**, helping users reconnect with stories that once resonated with them. It also serves as a smart manga organization system for collectors, adding structure and searchability to large personal archives.

On a broader level, the tool responds to a growing societal need for **human-centric, memory-friendly search systems**, especially as the volume of digital content increases and the way we recall media becomes less tied to metadata and more grounded in emotional or semantic memory. Addressing this need is important because it brings us closer to **natural, intuitive human-computer interaction**, and helps preserve meaningful media experiences that might otherwise be lost to time.

Approach

The project will be developed primarily using **Python**. The system architecture consists of two major modules: a **Preprocessing Module** and a **Query Module**.

1. Preprocessing Module

This module is responsible for understanding and summarizing manga content. Two alternative approaches are being considered:

- **Approach A**: Each manga page is segmented into panels (using a model such as **YOLO**), from which text is extracted. A language model (LLM) is then used to generate a textual summary of each page, which is eventually aggregated into a complete manga-level summary.

- **Approach B**: Each page is directly passed to a **multimodal LLM** (e.g., BLIP, GPT-4V) that processes both visual and textual information to generate meaningful content descriptions, which are then summarized into a manga-level overview.

In both approaches, the final summaries will be embedded using a vector encoder (e.g., **sentence-transformers**) and indexed in a vector database such as **FAISS** or **ChromaDB**.

2. Query Module

The user inputs a vague, natural language description of a manga they remember. The system searches the embedded database and retrieves top-matching candidate mangas. A large language model is then used to **re-rank and interpret** the results, providing an explanation of the relevance and presenting the top matches to the user.

Potential Risks & Mitigations

- **Low quality of content summarization**: Manga content can be visually complex, culturally nuanced, or rely heavily on non-verbal storytelling. These challenges may cause automatic summarization to miss important context or emotional tone.
    - *Mitigation*: In addition to automatic summarization, the system will support **manual or semi-automatic tagging** of manga content (e.g., genre, key themes, character types). Users can optionally provide **keyword-level filters or tags** to assist the retrieval process, improving precision and personalization.

Evaluation

To evaluate the effectiveness and correctness of our manga retrieval system, we plan to construct a **test set** using publicly available content such as **manga summaries, synopses, and wiki descriptions**. These sources will serve as ground truth for generating **query-document pairs**, simulating realistic user queries based on vague or partial plot recall.

We will measure system performance using **standard retrieval metrics**, including:

- **Precision**, **Recall**, and **F1-score**: to assess how accurately the system retrieves relevant manga titles.
- **Mean Reciprocal Rank (MRR)** or **Top-K Accuracy**: to evaluate the ranking effectiveness of the system’s output.

This evaluation strategy will help us determine both the **retrieval quality** and the **semantic alignment** between user queries and the retrieved manga content.

Timeline

Week 1: Project setup and system design
Week 2: Data collection, Preprocessing module development
Week 3: Query module development and integration
Week 4: Testing & evaluation

Task Division

Wei Chen: module development, data collection, testing
Zhaoyang Zhu: module development, data collection, testing