

Large Language Model and Stable Diffusion Story Game



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Introduction

Novel multiplayer game which leverages your choice of Large Language Model (LLM) and Stable Diffusion (SD) to co-write an illustrated story in real time through your web browser. Story setting and image style may be specified by the user, and the LLM generates two generic, secret endings for each player. The goal of the game is to steer the story toward one of your secret endings to win. During gameplay the LLM generates story text and SD image prompts based on player input.

Workflow and Technology Stack

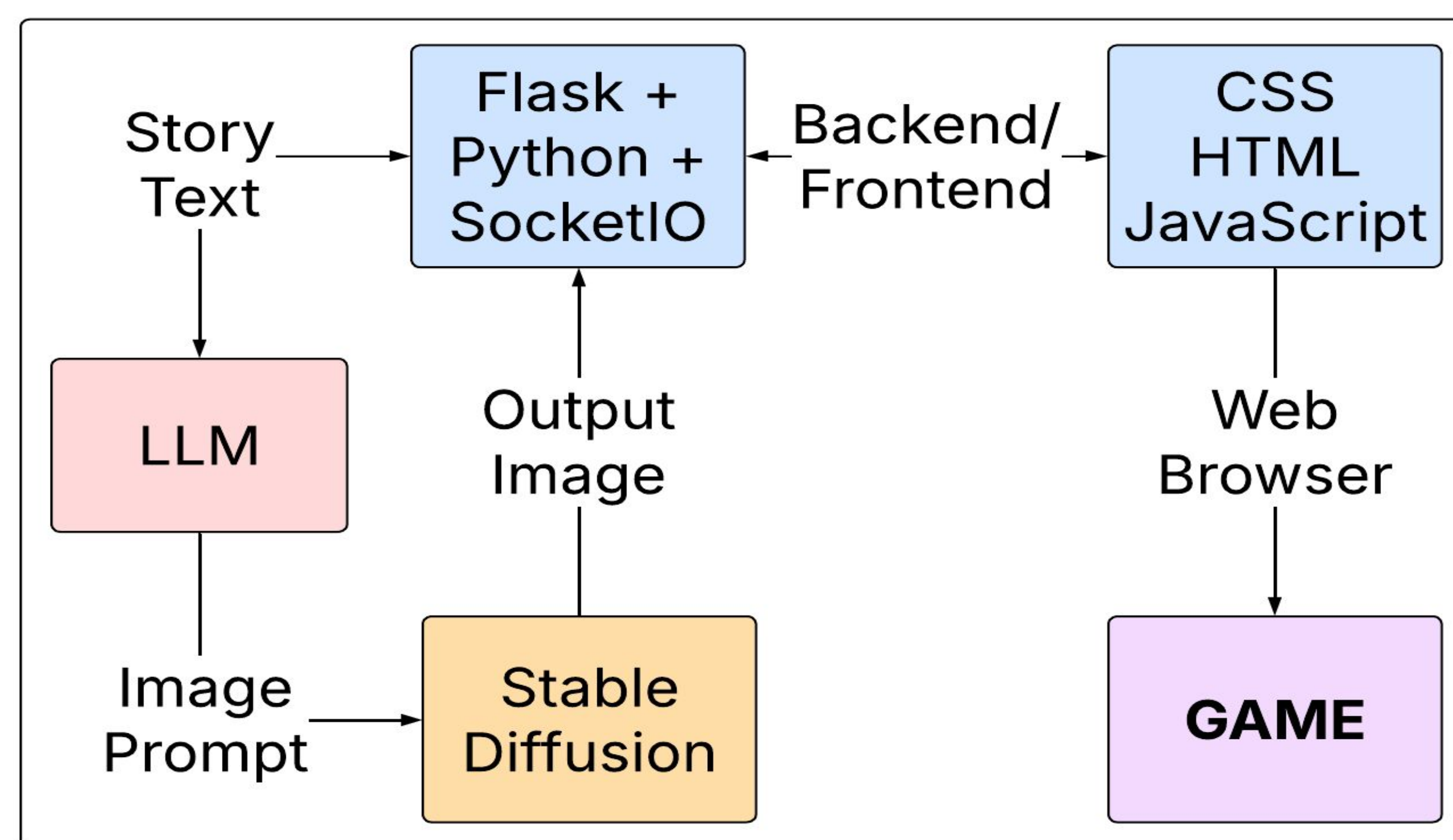
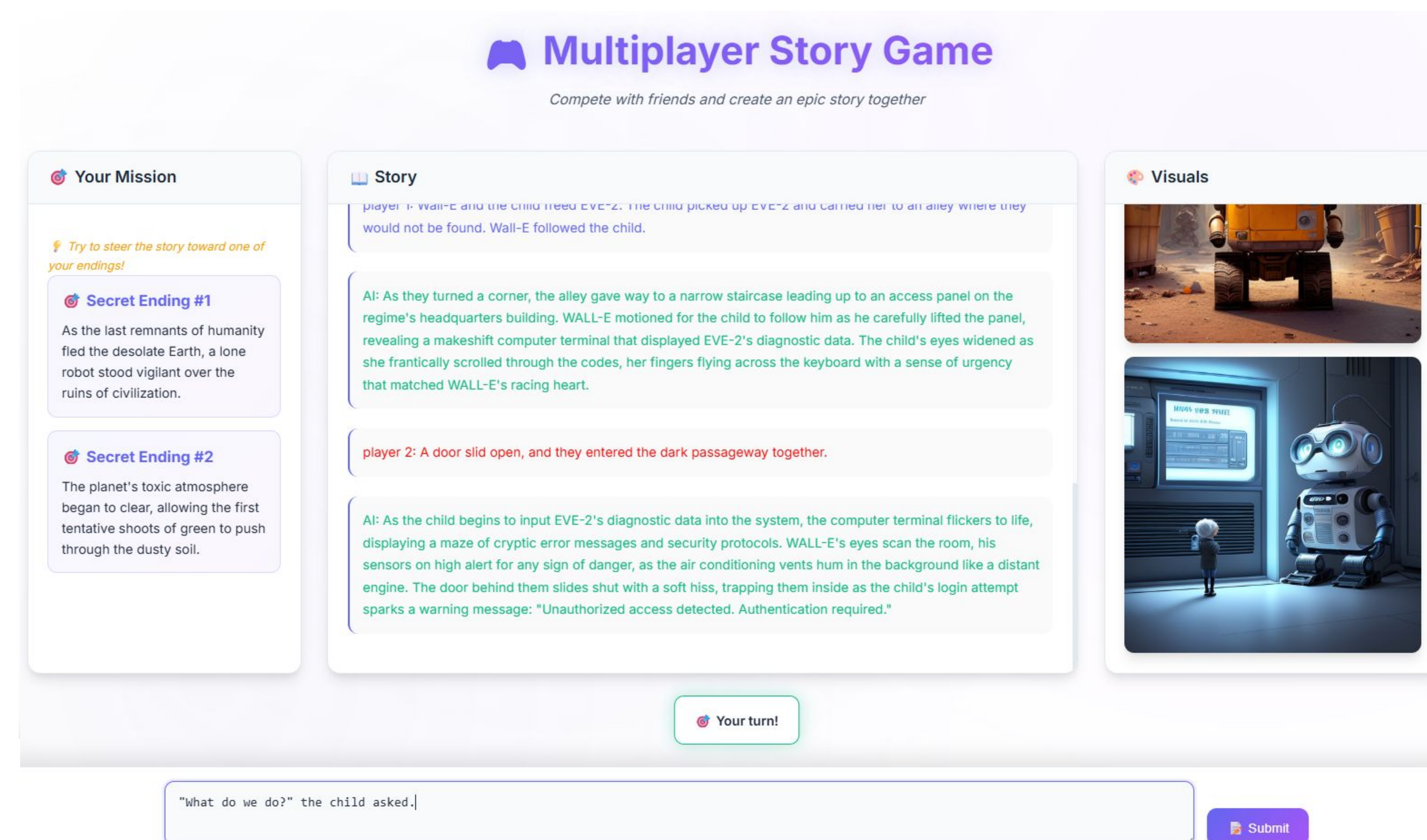


Figure 1. Workflow and technology stack of our multiplayer story game, showing real-time interaction between players and an LLM via Flask and SocketIO, with optional image generation through Stable Diffusion and a web-based front-end.

Gameplay



RAG and Stable Diffusion

- Enables LLMs to access external information without retraining.
- Ensures consistent/accurate image generation.
- Detects knowledge gaps in the LLM's response.
- Fills gaps by retrieving relevant context (e.g., from Wikipedia).
- LLM converts user input into detailed prompts for SD.

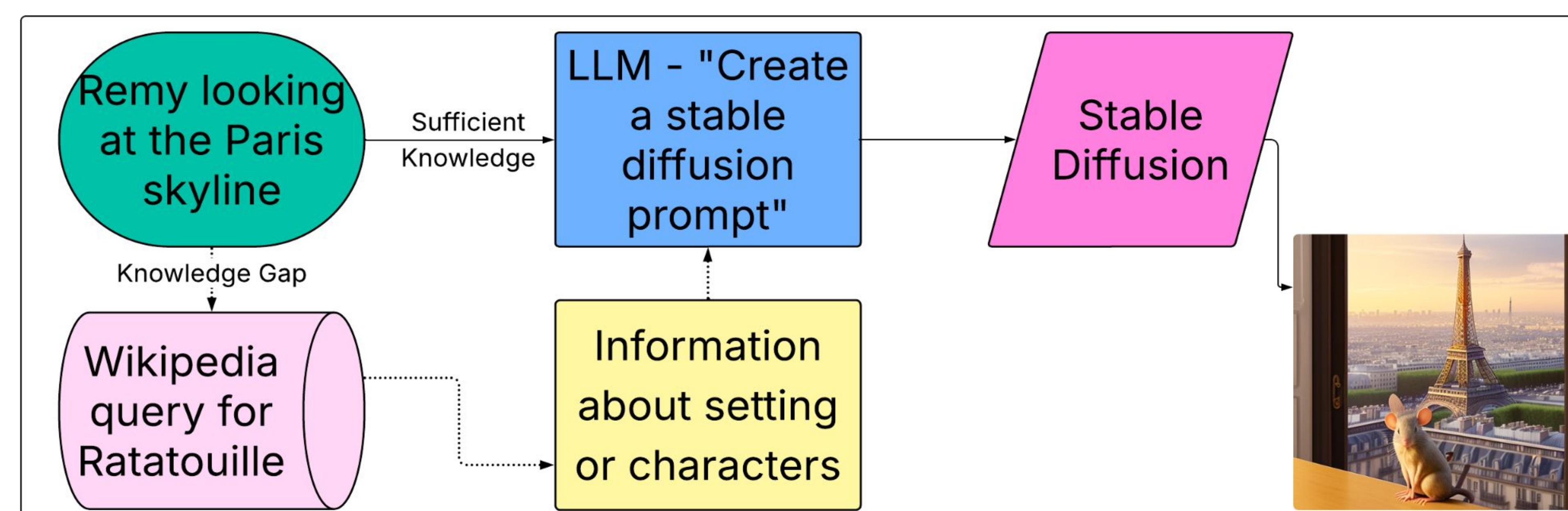


Figure 2. Retrieval-Augmented Generation (RAG) Process

Large Language Models

- llama 3.2
- gpt-3.5-turbo
- claude-opus-4
- gemini-2.0-flash
- deepseek-r1:7b

Features of the Game

- Choose the story setting/theme
- Specify image style
- Generated secret endings for players
- Story guided by LLM
- LLM determines winner
- Image prompts based on user input
- Color-coded text for LLM and users

Future Work

- Compare RAG to pure LLM responses
- Game consistency in story & images
- Differing LLM results
- Speed optimization (API calls vs local)
- UI improvements and stability
- Prompt optimization