Report of Deep Learning for Natural Langauge Processing

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Abstract

This report explores the application of general large models in automating web design and content generation. The experiment involves using a large language model (LLM) to generate both the HTML/CSS/JavaScript code for a web page and its content based on a given prompt. The goal is to evaluate the model's capability in creating functional, aesthetically pleasing, and thematically coherent web pages without manual coding. The study focuses on the generated web page's structure, visual design, interactivity, and content relevance. Key findings highlight the strengths and limitations of LLMs in automated web design and suggest potential improvements for future applications.

Introduction

Automated web design using large models is an emerging field that combines natural language processing (NLP) with front-end development. This experiment investigates whether a general large model can effectively replace or assist human developers in designing and populating web pages. The study addresses the following research questions:

1. How well can a large model generate syntactically correct and functional web code?

2. Can the model produce visually appealing and thematically consistent designs?

3. What are the limitations of using LLMs for automated web design?

The experiment leverages a large model to generate a web page based on the prompt: "Design a webpage for a quiz that determines which Genshin Impact character a user would be." The generated output includes HTML, CSS, and JavaScript, as well as the quiz logic and character data.

Methodology

Background Introduction

Overview of Genshin Impact

Genshin Impact is an open-world action role-playing game developed by miHoYo, renowned for its expansive character system, visually stunning design, and immersive world-building. Each character in the game possesses a unique backstory, elemental affinity, and combat style, providing rich content for designing interactive web applications such as a "Which Character Are You?" quiz.

Core Design of the Random Selection Web Program

The web application generated in this experiment is an interactive Genshin Impact-themed quiz page with the following key features:

Random Character Selection: Upon clicking a button, the system randomly selects and displays a character from a predefined roster.

Dynamic Detail Display: Shows the character's artwork, basic information (e.g., title, weapon type), and background story.

History Tracking: Saves the user's recently viewed characters for quick reference.

This design not only requires front-end interactivity but also ensures data integrity and thematic consistency, making it an ideal case study for evaluating large models' capabilities in automated web design.

Data Processing

Prompt Design: The experiment begins with a carefully crafted prompt specifying the webpage's purpose, features (e.g., random character selection, interactive buttons, history tracking), and visual style (e.g., dark theme, particle effects).

Model Output: The large model generates the complete code for the webpage, including embedded data (e.g., character images and details).

Generated Webpage Components

1. HTML Structure:

A container for the quiz interface.

Sections for displaying the character image, name, and details.

Interactive buttons for actions like "Start Quiz" and "View Details."

A history section to track past results.

2. CSS Styling:

Responsive design with dynamic background adjustments.

Aesthetic elements like particle effects, hover animations, and a dark theme with gold accents.

Flexbox and grid layouts for organized content display.

3. JavaScript Functionality:

Random character selection logic.

Dynamic loading of character details from embedded JSON data.

Interactive features like buttons for resetting the quiz or viewing details.

Evaluation Metrics

Functionality: The webpage should work as intended (e.g., correctly display characters, update history).

Visual Appeal: The design should be cohesive and visually pleasing.

Content Relevance: The generated content should align with the Genshin Impact theme.

Experimental Studies

Generated Webpage Overview

The model produced a fully functional webpage titled "你会穿越成为原神中的哪个角色" ("Which Genshin Impact Character Would You Be?"). Key features include:

A landing page with a "Start Quiz" button.

Random selection of a Genshin Impact character from a predefined list.

Display of the character's image, name, and detailed information (e.g., weapon type, vision, backstory).

Interactive elements like buttons to view details or reset the quiz.

A history section showing recently viewed characters.

Code Implementation

1. HTML: The structure includes semantic tags like `<header>`, `<main>`, and `<footer>`, along with divs for dynamic content.

2. CSS: Styles are organized for readability, with variables for colors and responsive design rules.

3. JavaScript: The logic handles character selection, data loading, and UI updates.

Partial example of generating a program

Below are screenshots of part of the process of using a large model to program and generate a webpage.

Figure 1：Communicating with large models

Figure 2：Communicating with large models

Figure 3：Communicating with large models

From the screenshots, it can be seen that under more specific conditions or guidance, the large model is able to meet the proposed requirements well.

Visual and Functional Testing

Visual Testing: The webpage was tested on multiple devices to ensure responsiveness. The dark theme with gold accents and particle effects was visually consistent.

Functional Testing: All buttons and interactive elements worked as expected. Character details loaded correctly, and the history tracker updated dynamically.

Experimental result

Since some component information is directly called from the local json file, it is necessary to download the **Live Server** component in **vscode** to implement this functionality.

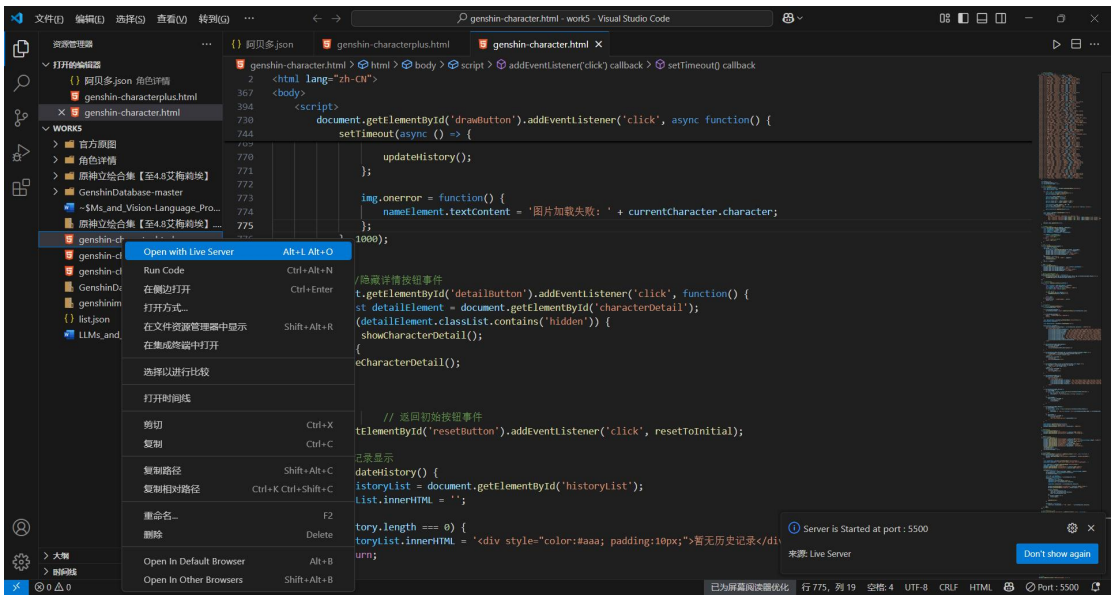

Figure 4: The environment required for the program to run

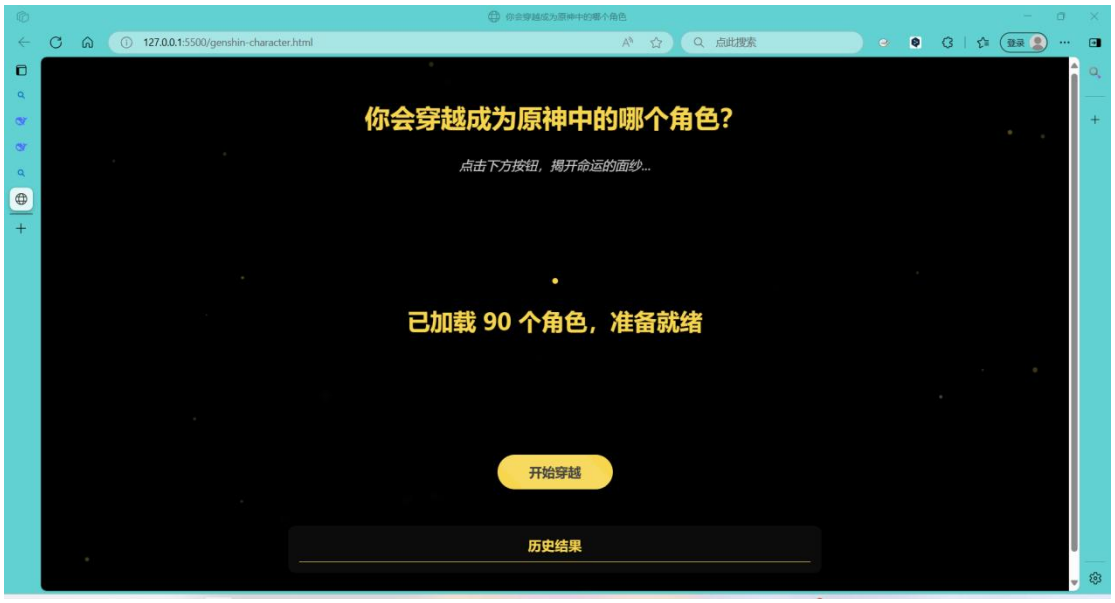

Figure 5: Webpage performance display

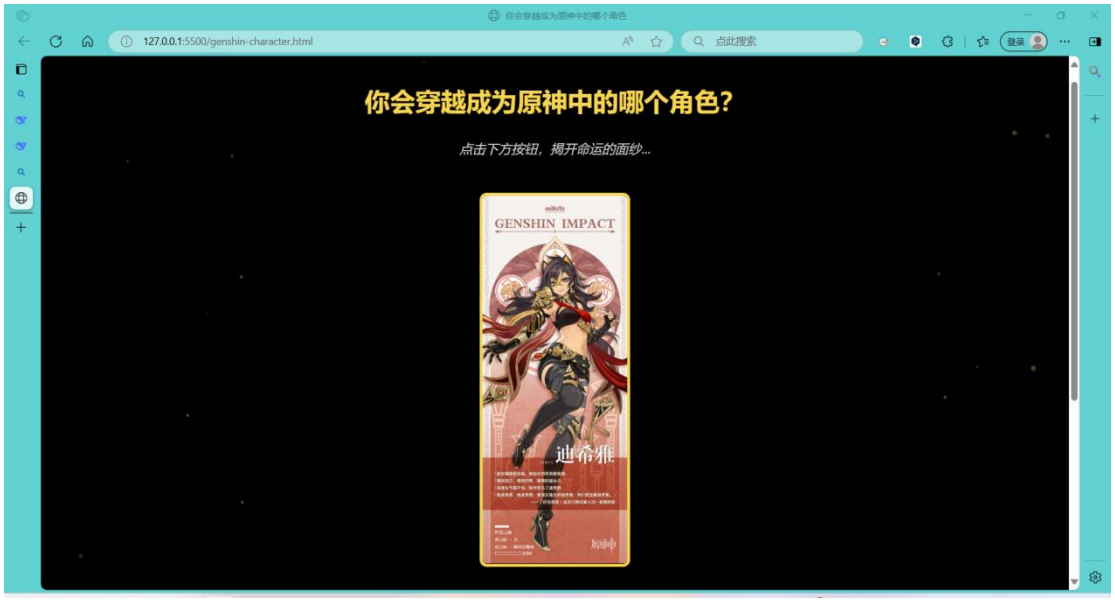

Figure 6: Webpage performance display

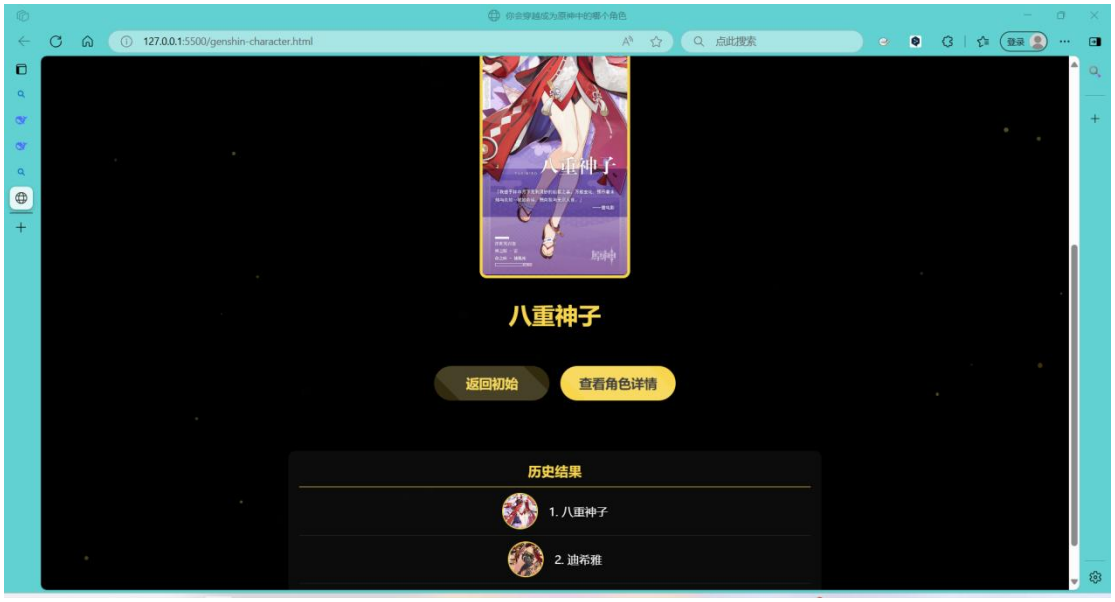

Figure 7: Webpage performance display

Figure 8: Webpage performance display

User Interaction Flow

Landing Page: Upon accessing the webpage, users are greeted with a dark-themed interface featuring a golden-accented title ("Which *Genshin Impact* Character Are You?") and a central "Start Quiz" button.

Character Selection: Clicking the button triggers a loading animation (spinner) while the system randomly selects a character from the embedded dataset (e.g., 90+ characters like Zhongli, Raiden Shogun, or Hu Tao).

Result Display: The selected character's high-resolution artwork appears with a zoom-in effect, accompanied by their name in a prominent gold font. A "View Details" button and a "Reset" button are revealed below.

Detail Exploration: Clicking "View Details" dynamically loads the character's profile (e.g., weapon type, Vision element, birthday) and backstory from embedded JSON data, displayed in a scrollable panel.

History Tracking: The sidebar records the last 5 viewed characters with thumbnails; clicking any entry instantly reloads their details.

Technical Execution

Randomization: Implemented via `Math.random()` to index the character dataset, ensuring fair distribution.

Dynamic UI Updates: JavaScript manipulates DOM elements (e.g., `classList.remove('hidden')`) to toggle visibility of components like the character image or detail panel.

Responsive Design: CSS media queries and viewport units adapt layouts for mobile/desktop screens.

Conclusions

The experiment demonstrates that general large models can effectively automate web design and content generation for specific use cases. The generated webpage was functional, visually coherent, and thematically appropriate. However, limitations such as static data and generic design highlight areas for improvement.

Future Work:

1. Integrate APIs for dynamic data fetching.

2. Experiment with more detailed prompts to enhance creativity.

3. Combine model output with human editing for finer customization.

References

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