使用大语言模型的网页前端开发

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Abstract

近年来，大语言模型（LLMs）在自然语言处理领域取得了突破性进展，其强大的代码生成与理解能力使其在软件开发中展现出巨大潜力。本文探讨了大语言模型在网页前端开发中的应用方式，包括代码自动生成、组件设计、调试辅助等方面。我们以具体实践为例，评估了对比了 ChatGPT-4o[1] 与 Qwen3[2] 模型在前端开发流程中的实际效果，并分析其优势与局限性。实验表明，LLMs 能显著提升开发效率，降低入门门槛，但在可控性、上下文理解和项目维护方面仍需谨慎对待。

Introduction

网页前端开发作为软件工程的重要组成部分，涉及 HTML、CSS、JavaScript 及各类框架（如 React、Vue）的综合应用。传统前端开发依赖开发者手动编码与调试，工作量大、重复性强。随着大语言模型（如 GPT-4）的发展，其对自然语言与代码的深度理解能力为前端开发提供了全新范式：开发者通过自然语言描述需求，模型便可输出相应代码、解释行为甚至进行错误分析。本文尝试使用 ChatGPT-4o 与 Qwen3 模型，进行网页前端的开发，对比两者在实际开发中的表现。并分析大语言模型在前端开发中的优势与局限性。

Methodology

目标网页和提示词

我们设计了一个简单的游戏官网，主要用于展示游戏的美术风格、玩法介绍以及突出游戏特点。根据这个任务，我们制定了以下提示词：

> 制作一个游戏介绍网页，这是一款像素风的包含了 Roughlike 要素，在多种群系冒险、邂逅各种各样的伙伴，打造和升级自己的装备，和伙伴和宠物一起冒险的游戏。网页包括核心玩法的介绍，几个可能遇到的角色的介绍，一些装备和宠物的介绍。

模型选择

因为在网页设计上需要一定的美术资源，因而选用了具有较好多模态能力的 GPT-4o 模型和 Qwen3 模型。两者都支持自然语言输入，并能生成相应的 HTML、CSS 和 JavaScript 代码。同时具有生成图像的能力。

在这里我们选用简单的 HTML 网页，并没有使用复杂的前端框架（如 React 或 Vue），也没使用 JavaScript 的复杂逻辑，只探究其前端设计能力。

在图片生成上，分别有头图、背景图的网页外观设计，还有角色、装备、宠物系统的内在设计。

Conclusions

GPT-4o 与 Qwen3 模型生成的网页分别如下所示：

Figure 1: GPT-4o 生成的网页

Figure 2: Qwen3 生成的网页

从网页设计上来看，GPT-4o 生成的网页整体布局比较简单，但是比较大气，头图占到了比较大的面积，需要用户下划才能看到更加详细的内容。而 Qwen3 生成的网页则选择了以选项卡的形式呈现，将整体内容分为了四个选项卡：核心玩法、角色介绍、装备系统和宠物伙伴，更加直观清晰，同时还在底部添加了创作者的署名，比较完善。

在提示词较为简单模糊的情况下，Qwen3 表现出更加出色的设计能力，能自己填充、设计内容的布局，风格上更为奔放。而 GPT-4o 表现的比较拘谨，但这也体现了其具有更好的可控性，在具有更详细提示词的情况下可能能给出更好的方案。

Figure 3: GPT-4o 生成的角色图

Figure 4: Qwen3 生成的角色图

在美术资源的生成上，二者的风格有所差异，但 GPT-4o 在对提示词、上下文的理解中表现更好，生成的图片更符合我的预想，同时在不同美术资源间的风格一致性也保持的更好。Qwen3 在图像生成中体现了较差的记忆能力，生成的图片风格差异较大，不能直接在项目中使用。这可能也与提示词较为简单模糊有关，但在处理较长的提示词，更多的要求时，其只能满足部分要求，同时不能根据一张已有的图片来制作一张风格类似的图片。

总的来说，GPT-4o 与 Qwen3 在网页前端开发中各有优势。GPT-4o 在代码生成、上下文理解和图像生成方面表现更为出色，适合需要高可控性和一致性的项目。而 Qwen3 则在设计布局和创意表达上更为奔放，适合快速原型设计和创意探索。两者的结合可以为前端开发提供更全面的支持。大语言模型在网页前端开发中展现出强大的潜力，但仍需注意其局限性，如可控性、上下文理解和项目维护等问题。未来，随着模型的不断优化与发展，我们有理由相信大语言模型将在前端开发领域发挥更大的作用。

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