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AI Portfolio Maker / Builder Using Artificial Intelligence

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Abstract: A professional portfolio is critical requirement for students, developers, designers, and working professionals seeking employment or freelance opportunities. The traditional process of building a portfolio website demands knowledge of HTML, CSS, and JavaScript, which is a barrier for many users. This paper proposes an AI Portfolio Maker, an intelligent web-based system that automatically generates personalized, professional portfolio websites from user-provided information using Artificial Intelligence and Natural Language Processing. The system is implemented using Python (Flask), the Anthropic Claude API, React.js, MongoDB, and Tailwind CSS. Users supply their name, skills, projects, education, experience, and preferences; the AI engine generates structured content, selects appropriate design templates, and produces a complete deployable portfolio. Evaluation with 50 users shows accurate, aesthetically pleasing portfolios generated in under five minutes with high satisfaction.

Keywords: AI Portfolio Builder, Artificial Intelligence, Natural Language Processing, Automated Web Development, Large Language Models, Claude API, Portfolio Generation, Flask, React.js.

I. INTRODUCTION

Artificial Intelligence has revolutionized software development by automating complex tasks that previously required significant human expertise. Portfolio creation is one domain where AI makes a meaningful impact. A portfolio website serves as a digital identity card for professionals, showcasing skills, projects, and experience to potential employers or clients.

Despite the importance of a professional online portfolio, many individuals—particularly students and early-career professionals—lack the web development skills to create one from scratch. Existing website builders offer templates but still require manual effort, design decisions, and content writing expertise.

The proposed AI Portfolio Maker addresses this gap by leveraging Large Language Models (LLMs) and modern web frameworks to automatically generate a complete, personalized portfolio website from simple user input, without requiring any coding knowledge from the user.

II. PROBLEM STATEMENT

Many professionals and students struggle to create a compelling portfolio website due to limited web development knowledge, time constraints, and the high cost of hiring developers or designers.

Existing portfolio builders such as Wix or Squarespace offer drag-and-drop interfaces but still require users to manually write all content, arrange layouts, and make design decisions—tasks that are time-consuming and difficult without design expertise.

There is a clear need for an intelligent system that takes

structured user input and automatically generates a complete, professional-quality portfolio website using AI, removing all technical and creative barriers.

III. OBJECTIVES

- To develop an AI-based system that automatically generates portfolio websites.
- To use Large Language Models for professional content generation.
- To provide multiple design templates with intelligent theme selection.
- To allow users to preview, customize, and download their portfolios.
- To enable one-click deployment of the generated portfolio.
- To eliminate the need for coding or design skills from the user

IV. LITERATURE REVIEW

Automated content generation using AI has been an active research area. Radford et al. (2019) demonstrated that large language models such as GPT-2 could generate coherent, contextually relevant text from simple prompts, laying the groundwork for intelligent content automation.

Brown et al. (2020) showed that few-shot learning with GPT-3 can produce high-quality structured output—including code and professional writing—with minimal user instruction.

Beltramelli (2018) proposed pix2code, a neural network that generates HTML/CSS code from UI screenshots, demonstrating the feasibility of AI-driven code generation for web interfaces. The emergence of Claude (Anthropic, 2023) and similar instruction-following LLMs has enabled practical deployment

of AI content generation in production, producing JSON, HTML, and professional text with high reliability and consistency.

V. TECHNOLOGIES USED

- **Python (Flask):** Backend server and REST API development.
- **Anthropic Claude API:** AI-powered content and code generation.
- **React.js:** Dynamic, interactive frontend interface.
- **Tailwind CSS:** Utility-first CSS for responsive design templates.
- **MongoDB:** Database for storing user profiles and generated portfolios.
- **Node.js:** Runtime environment for frontend build tooling.
- **HTML5 / CSS3 / JavaScript:** Core technologies for portfolio output.
- **GitHub Pages / Vercel API:** One-click portfolio deployment.
- **JWT Authentication:** Secure user account management.

VI. SYSTEM ARCHITECTURE

The architecture of the AI Portfolio Maker consists of four main layers: the User Interface Layer, Application Logic Layer, AI Processing Layer, and Data Storage Layer.

A. User Interface Layer

A React.js single-page application provides users with a multi-step form to input personal information including name, skills, projects, work experience, education, social links, and preferences.

B. Application Logic Layer

A Flask REST API server handles authentication, request routing, and business logic, communicating between the frontend and the AI Processing Layer.

C. AI Processing Layer

The Claude API receives structured user data and generates professional bio text, project descriptions, skill summaries, and complete HTML/CSS portfolio code based on selected templates.

D. Data Storage Layer

MongoDB stores user accounts, portfolio data, generated HTML files, and version history. Portfolios can be exported as ZIP files or deployed directly to GitHub Pages.

- No coding or design skills required from the user.
- Portfolio generation completed in under 5 minutes.
- AI-generated content is professional and contextually relevant.

System Workflow

User Input → Data Validation → AI Content Generation → Template Selection → Portfolio Rendering → Preview & Edit → Download / Deploy

VII. METHODOLOGY

The methodology of the proposed system includes the following sequential steps:

A. Data Collection

Users complete a guided multi-step form providing personal details, skills with proficiency levels, project descriptions, work history, education, and aesthetic preferences.

B. AI Content Generation

Collected data is structured into a JSON prompt and submitted to the Claude API. The model generates polished professional text: a personal summary, skill descriptions, project write-ups, and a complete About section tailored to the user.

C. Template Selection

Based on the user's professional role (developer, designer, writer, etc.) and aesthetic preference, the system intelligently recommends and applies one of several pre-built Tailwind CSS templates.

D. Portfolio Rendering

The AI-generated content is injected into the selected HTML/CSS template, producing a complete portfolio website. Users can preview the result in real time within the browser.

E. Customization

An inline editor allows users to modify colors, fonts, section order, and individual text content before finalizing their portfolio, giving full creative control without any coding.

F. Export and Deployment

Users can download their portfolio as a ZIP file containing HTML, CSS, and assets, or deploy it directly to GitHub Pages or Vercel with a single click.

VIII. ADVANTAGES OF THE SYSTEM

The proposed AI Portfolio Maker provides the following key advantages:

- Multiple responsive design templates available.
- One-click deployment to public hosting platforms.
- Supports portfolio versioning and history management.
- SEO-optimized HTML output for better search visibility.

- Fully customizable after AI generation.
- Secure user authentication and data storage.

A. Students and Fresh Graduates

IX. APPLICATIONS

Students can quickly generate portfolios showcasing academic projects, internships, and skills to attract recruiters during campus placement drives.

B. Software Developers

Developers can create technical portfolios highlighting GitHub projects, programming languages, frameworks, and open-source contributions without spending time on web design.

C. Designers and Creative Professionals

Graphic designers, UI/UX professionals, and photographers can generate visually attractive portfolios showcasing their creative work with gallery-style layouts.

- Ensuring AI-generated content is accurate and non-repetitive across all sections.
- Managing API rate limits and response latency during peak usage.
- Designing templates that adapt well to varying amounts of user content.
- Multi-language portfolio generation for global users.
- AI-powered portfolio analytics and visitor tracking dashboard.
- Voice-input mode for hands-free portfolio creation.
- Integration with LinkedIn for automatic data import.
- AI chatbot on generated portfolios to answer visitor

XII. RESULTS

The AI Portfolio Maker was tested with 50 users across different professional backgrounds including software developers, graphic designers, students, and freelancers. Key results are below:

Content accuracy rating (peer review)	91%
Responsive design compliance	100%
Successful one-click deployments	94%
Users requiring zero code edits	78%

The results confirm that the AI Portfolio Maker successfully

- Cost-effective compared to hiring a web developer.

D. Freelancers

Freelancers on platforms such as Upwork and Fiverr can generate professional portfolios to increase credibility and attract higher-value clients.

E. Job Seekers

Professionals switching careers or re-entering the job market can rapidly build portfolio websites that highlight transferable skills and relevant experience.

F. Academic Institutions

Universities can integrate the system to help students generate portfolios as part of placement training programs, improving overall employment outcomes.

X. CHALLENGES FACED

- Handling diverse user inputs including non-English characters and special symbols.
- Maintaining consistent visual quality across different devices and browsers.
- Providing a one-click deployment experience across multiple hosting providers.

XI. FUTURE ENHANCEMENTS

questions.

- Automated A/B testing of different portfolio layouts for better engagement.
- Mobile application for portfolio creation and management on-the-go.
- AI resume generator integrated with the portfolio system.

Metric	Result
Average portfolio generation time	3 minutes 42 seconds
User satisfaction rating	4.6 / 5.0

automates portfolio creation with high user satisfaction, significantly reducing the time and effort required to build a professional online presence.

XIII. CONCLUSION

An AI-powered portfolio builder represents a significant advancement in making professional web presence accessible to everyone regardless of technical skill. The proposed AI Portfolio Maker demonstrates how Large Language Models, combined with modern web frameworks, can automate the

end-to-end process of portfolio website creation.

The system uses the Claude API for intelligent content generation, Flask for robust backend processing, React.js for an interactive user experience, and Tailwind CSS for beautiful, responsive design templates—producing a complete, deployable portfolio in under five minutes.

Future work will focus on multi-language support, LinkedIn integration, and AI-powered portfolio analytics to further

enhance the system's utility and reach.

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