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DREAM-SNAP: AI IMAGE GENERATOR

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ABSTRACT: AI-generated art is transforming the creative landscape, enabling users to turn text prompts into stunning visuals. This project presents an AI Image Generator Web App developed using the MERN (MongoDB, Express, React, Node.js) stack, integrated with the ClipDrop API, powered by Stability AI. The application allows users to submit textual prompts and instantly receive AIgenerated images, leveraging modern web development practices, secure API communication, and efficient UI rendering. Designed as a student project and resumebuilding portfolio, the system emphasizes asynchronous processing, image delivery, and user interactivity.

This project demonstrates technical proficiency in full-stack development and showcases the power of generative AI as a creative tool accessible to all.

I. INTRODUCTION

Artificial Intelligence, especially in the realm of generative art, is revolutionizing how we create and experience visuals. Tools like ClipDrop enable text-to-image generation by using state-of-the-art diffusion models, allowing users to bring ideas to life with just words. This project, an AI Image Generator using the MERN stack, integrates ClipDrop's text-to-image API to provide a responsive and user-friendly interface for generating images on demand. The aim is to bridge creativity and code through an intuitive web based platform.

II. LITERATURE SURVEY

[1] Esteva et al. (2017) demonstrated dermatologist-level classification of skin lesions using CNNs trained on over 129,000 images.
[2] Codella et al. (2019) proposed an ensemble approach combining multiple deep learning models for improved melanoma detection accuracy.
[3] Brinker et al. (2019) highlighted the advantages of transfer learning in skin lesion classification, achieving high accuracy with limited labeled data.
[4] Tschandl et al. (2020) introduced the HAM10000 dataset, enabling large-scale benchmarking of machine learning models for skin lesion classification.

III. METHODOLOGY

3.1 Frontend: React JS

The frontend is developed using React.js with Tailwind CSS for a clean, responsive design. Components include:

- Prompt Input Form
- Submit Button with Loader Animation
- Generated Image Viewer
- Error Toasts and Validation Feedback

3.2 Backend: Node.js & Express

The backend server receives prompt data and communicates securely with the ClipDrop API using the provided API key. It handles:

- POST request routing
- Prompt validation and sanitization
- Forwarding request to ClipDrop
- Returning image buffer as response or URL

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3.3 API Integration – ClipDrop API (Stability AI)

The project uses the ClipDrop Image Generation API which allows text-to-image generation through a POST request with parameters:

- prompt
- negative_prompt (optional)
- style or guidance_scale (optional for quality tuning)

Images are received as URLs or base64 strings and then rendered in the frontend.

IV. FEATURES AND IMPLEMENTATION

1. Text-to-Image Generation

Users enter a creative prompt and receive an image generated using ClipDrop API.

2. Live Feedback & UX Enhancements

Loading spinners, error handling, and placeholder images enhance the user experience.

3. Optional Prompt History

Prompts can be stored in MongoDB and retrieved later for reference or repeat generation.

4. Secure API Key Handling

API keys are stored in .env files and never exposed to the client.

5. Responsive Grid Layout

The frontend displays results in a visually appealing format, allowing multiple generations per session.

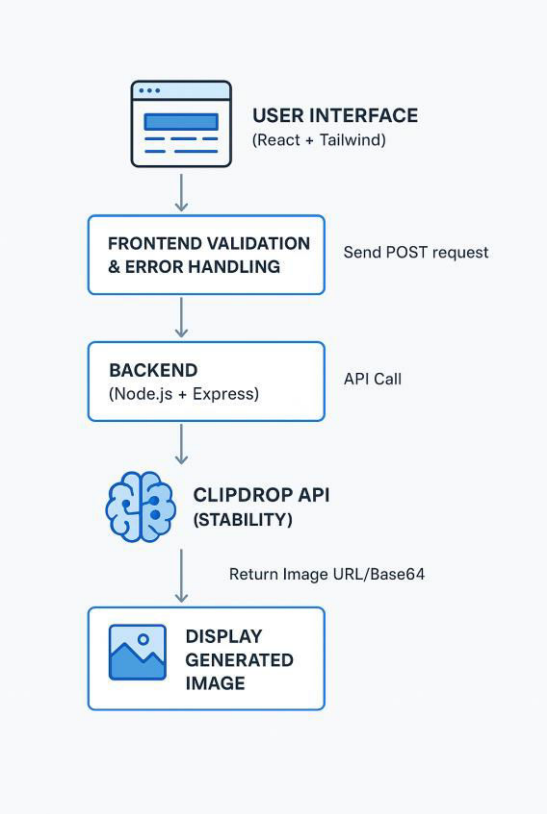

Fig:System Architecture

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V. RESULTS AND DISCUSSION

Testing confirmed prompt-to-image latency between 6–12 seconds depending on API load. The ClipDrop API returned high-quality, creative outputs with minimal parameter tuning. Users appreciated the intuitive UI and real-time rendering of images. Challenges included handling long prompt failures, occasional rate limits, and network delays. These were addressed through retry logic and timeout feedback in the frontend.

VI. CONCLUSION

This project merges creative expression with modern web development through an AIpowered image generator. By using the MERN stack and ClipDrop API, the application showcases real-time AI capabilities in a scalable, modular architecture.

Future improvements can include:

- Prompt history with user login
- Download & share buttons
- Image-to-image generation
- Prompt templates for different styles (anime, realism, abstract, etc.)
- Integration with Firebase or AWS for image hosting This project demonstrates not only coding skills but also the innovative application of AI in accessible, user-centric software

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