ENR106 Project Problem Definition Details

Project Title: GALLERY GENIE

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## Objectives of developing software/application:

* To democratize image editing to anyone with a computer without needing a PHD in photoshop or image editing in general
* AI-Powered Intent Recognition: Implement state-of-the-art semantic understanding using sentence transformers to accurately match user descriptions with appropriate image effects.​
* To support cross-platform web-based image viewing and processing, enhancing accessibility for users on different operating systems.
* To create a photo editing app that is not built to ostracize casual users and is done by creating a friendly UI and fun experience
* Privacy

## End-Users of the software:

* **General Users** - Individuals interested in experimenting with image effects for creative or fun purposes, such as hobbyists or students.
* **Design Enthusiasts and** **Digital Artists** - Users who want quick transformations like sepia, sketches, or pixelation without complex software like Photoshop.
* **Content Creators** - Social media influencers, bloggers, and digital artists seeking quick aesthetic transformations for their visual content with minimal friction.
* **Students and Educators** - Academic users exploring image processing concepts through hands-on experimentation with various filters and effects.
* **Hobbyists** - Photography enthusiasts experimenting with artistic transformations and retro aesthetics for personal projects.

## Listing of functionality/features/main modules:

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* User Interface – A Playful Mascot and a visually simulatingfirst page to engage viewer
* Login Module: Simulates authentication with token check, updates login counts, and greets returning users.
* Tool Suggestion Engine: Uses scikit-learn's TF-IDF vectorizer and cosine similarity to recommend image effects based on user's natural language query (e.g., "make it retro" suggests pixelate-8bit).
* Image Processing Modules: Implements effects using OpenCV and ascii\_magic:
* ASCII Art: Converts images to ASCII art and saves as image.
* Aesthetic Blur: Applies Gaussian blur for a soft, dreamy effect.
* Vintage Sepia: Converts to grayscale and applies warm sepia tones.
* Invert Colors: Inverts the image for a negative/cyberpunk look.
* 8-bit Pixelate: Resizes to low resolution and upscales for pixelated retro style.
* Pencil Sketch: Generates a sketch-like effect using edge detection and blending. ETC
* Path Management: Remembers and prompts for last used image path, validates file existence, and generates descriptive output filenames.
* Output Handling: Saves processed images with effect-specific names and opens them in the default system viewer.
* Interactive Menu: Allows manual tool selection if suggestion is not used or score is low.

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