AI Virtual Painter - Project Proposal

Project Overview

This project introduces an AI-powered virtual drawing tool that enables users to paint using hand gestures captured through a webcam. With real-time computer vision tracking, the system translates hand movements into brush strokes on a digital canvas. Users can change brush size, select colors, and save their artwork as images. The app aims to make digital art creation more engaging and accessible for students, artists, and beginners.

Main Objectives

- Build an intelligent painting application using hand gesture tracking.
- Design an interactive UI for selecting brush sizes and colors.
- Allow users to store their paintings as image files.
- Enhance performance for smooth real-time tracking.
- Deliver clear documentation and a user guide.

Project Scope

Included in Scope:

- Implementing hand tracking via MediaPipe and OpenCV.
- Enabling real-time drawing using gestures.
- Designing an interactive interface with brush and color settings.
- Providing image export functionality.

Excluded from Scope:

- 3D modeling or body tracking.
- Integration with mobile or web platforms.
- Online sharing or collaboration features.

Team Members and Roles

Team Member	GitHub	Role	Responsibilities
Youssef El-Shennawy kamel	Youssef-ElShennawy	Team Leader / Lead Developer	Leads project, integrates UI, manages team tasks.
Amr Mostafa Said	amr720	Developer	Implements hand tracking, assists with testing and integration.
Adham Emad AbdelMawla	adham3mad	Tester / UI Developer	Designs UI, performs testing, documents features.

Tools and Technologies

Tool / Library	Purpose	Usage Details
Python	Programming Language	Used for writing and running the core application logic.
OpenCV	Computer Vision	Handles webcam input, frame processing, and canvas rendering.
MediaPipe	Hand Tracking	Detects and tracks hand landmarks to generate drawing coordinates.
Tkinter / PyQt	User Interface Framework	Builds the UI for brush and color selection along with save options.
GitHub	Version Control	Used for project collaboration and source code management.

4-Week Work Plan

Week	Planned Tasks	Expected Outcome	Assigned To
Week 1	Set up the environment, plan system structure, start UI sketching.	Functional setup and UI layout design.	Youssef
Week 2	Implement hand tracking and connect with drawing logic.	Working prototype with gesture-based drawing.	Amr
Week 3	Enhance interface, test accuracy, fix bugs, and boost FPS.	Stable and efficient version.	Adham
Week 4	Finalize documentation, record demo video, and prepare slides.	Completed deliverables and final presentation.	Entire Team