VisionX

Challenge 1: Removing Reflections from Images

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Github Repo: https://github.com/Radi8ion/visionx

Qualcomm

Technology Stack

React Native & Tailwind CSS (Frontend)
ExpressJs and NodeJs (Backend)
MongoDB (Database)
Flask API (Machine Learning Integration)
ONNX (Open Neural Network Exchange)
Tensorflow & Keras
OpenCV (Image Processing & Visualization)
Numpy/Pandas (Data Manipulation)
Seaborn (Visualization of metrics & training results)
Scikit-Image (Image Manipulation Library)
Vercel (Web Hosting)
Python (language)

Overview:

This web-based utility uses Advanced AI Model Architecture to eliminate reflections from photographs captured through reflecting surfaces. This system achieves great accuracy and precision by integrating a lightweight Swin-Unet with Attention Mechanisms, while remaining accessible to low-resource hardware.

Features:

1. **Model**:
    - Swin-Unet combines deep learning with transformers for exceptional results.
    - Robust against complex lighting conditions and reflective surfaces.
2. **Web UI**:
    - A modern, user-friendly interface using **React** and **TailwindCSS**.
    - Drag-and-drop functionality, side-by-side comparison, and download options.
3. **Optimized for Resource Constraints**:
    - Efficient enough to run on limited GPU systems.
    - Open-source libraries ensure free usage.
4. **Real-Life Applications**:
    - Enhance personal photography.
    - Improve security camera footage.
    - Assist autonomous vehicles in handling reflective environments.

Conclusion:

In conclusion, my study highlights how AI can tackle real-world challenges, enabling reflection-free photography for anyone. Using this model we can achieve high-precision outcomes through an intuitive web interface, focusing on open-source tools and low-resource usability. The modular architecture enables for future upgrades, assuring its utility in teaching, research, and practical applications equally.

Model Workflow