ARTEFACT 2

System & DPI Architecture Overview

AI-enabled Image Enhancement Infrastructure

Architecture Overview

1. User Interaction Layer

- PyQt5 interactive GUI
- Real-time preview toggle
- Color hint injection interface

2. AI Processing Layer

- PyTorch deep learning model
- Color propagation model
- Inference and prediction workflows

3. Data and Output Management Layer

- Structured image outputs (ours.png, input.png, mask.png)
- Full-resolution exports
- .npy file generation for retraining and reuse

4. Governance & Control Layer

- Controlled model execution
- Reproducible output storage
- Clear separation between input, mask, and generated output

DPI Principles Applied

- Modular AI components reusable across imaging workflows
- Designed for extensibility (batch processing, video support)
- Structured output management
- Custom validation embedded by design

Why this Matters

Rather than deploying AI as a black-box system, the platform institutionalized AI into a controlled and scalable infrastructure component.