Computer Vision Final Project Proposal

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1. Automatic Document Scanner

1.1 Objectives

The goal of this project is to develop a system that takes an image of a physical document and outputs a corrected, binarized, and flattened version, similar to what a real scanner would produce.

- **Input:** A photograph of a document (e.g., from a smartphone or webcam).
- **Output:** A top-down, perspective-corrected, black-and-white image of the document.

The system must:

- Detect the borders of the document in the image.
- Correct the perspective distortion.
- Enhance the readability (binarization, contrast adjustment).

Limitations:

- The system is not required to perform OCR or understand document content.
- It assumes a single document per image and that the document is reasonably well-lit and not severely wrinkled.

1.2 Applications

This system is useful in scenarios where users need to scan documents but lack a physical scanner. It has practical applications in:

- Mobile document scanning apps.
- Digital archiving of paper records.
- Simplified digitization in educational or bureaucratic contexts.

1.3 Performance Evaluation Metrics

- **Corner Detection Accuracy:** Distance error between detected and truth corners. The coordinates of the truth corners are provided in the file "coordinates.txt".
- **IoU (Intersection over Union):** Between the detected document area and the truth, calculated on the scanned image area located in the Output folder.
- ***Processing Time:*** *Time taken per image — lower processing times are preferable.*