Overview

An interactive MATLAB-based computer vision application designed to detect and classify geometric shapes within digital images using Image Processing.

Key Features

- Multi-Shape Detection: Automatically detects all shapes in an image once the Detect button is pressed.
- Advanced Image Processing: Includes Adaptive Thresholding, Canny/Sobel Edge Detection, and Watershed segmentation to handle touching objects.
- Visualization Suite: Toggle contours, bounding boxes, centroids, and color-coded labels.

Project Structure

- Preprocessing and Noise reduction
- Segmentation: Binary conversion via user-selected methods (Adaptive vs. Global).
- Feature Extraction: Calculation of geometric descriptors.
- Classify shapes using a predefined logic

Requirements

- MATLAB (R2021a or later recommended)
- Image Processing Toolbox

Usage

- Run the App: Execute ShapeRecognitionApp in the MATLAB Command Window, or run on MATLAB online.
- Load Image: Click " Load Image" to import your source file.
- Configure Parameters: Adjust the Threshold and Area sliders based on your image quality.
- Detect: Click " Detect Shapes" to run the analysis.
- Export: Use the "Export Results" button to save the data table.