1. Getting Started

To launch the application, ensure your MATLAB path includes the folder containing ShapeRecognitionApp.mlapp (or .m). Or upload to MATLAB online

1. Type ShapeRecognitionApp in the MATLAB Command Window. Or Run directly on MATLAB online
2. The main interface will open, featuring two display axes and a control sidebar.

2. Loading and Initializing

Before detection can occur, you must provide a source image.

1. Load Image: Click the Load Image button. Supported formats include .jpg, .png, .bmp, and .tiff.
2. Image Requirements: For best results, use images with high contrast between the shapes and the background.
3. Reset: Use the Reset button at any time to clear the axes and return all sliders to their default positions.

3. Configuring Detection Parameters

Adjust these if the shapes are not being detected correctly:

Preprocessing Methods

- Adaptive (Default): Best for images with uneven lighting or shadows.
- Global Threshold: Best for high-contrast, perfectly lit scans.
- Edge Detection: Best for shapes that are outlines rather than solid fills.

Fine-Tuning Sliders

- Threshold: Controls the sensitivity of the binarization. If your shapes are "disappearing," try lowering this value.
- Min/Max Area: Filters out noise. If the app detects tiny dots as shapes, increase the Min Area.
- Circularity/Solidity: Defines how "perfect" a shape must be. For example, a lower Solidity setting helps detect irregular or "distorted" stars.

4. Selecting Shapes to Detect

The Shape Selection panel allows you to narrow the focus of the analysis

5. Visualization & Results

Once you click Detect Shapes, the results appear in the right-hand axes.

Customizing the View

You can toggle the following overlays in the Visualization Options:

- Contours: Draws the detected boundary.
- Bounding Box: Shows the rectangular limits of the shape.
- Labels: Displays the Shape Type and ID number.
- Transparency Slider: If Fill Shapes is checked, use this to see the original image through the colored overlays.

6.Troubleshooting

- Too much noise/dotsIncrease the Min Area value.
- Shapes are "merged"Try the Edge Detection method or adjust the Threshold.
- Wrong classification Adjust Circularity (for circles) or Solidity (for stars/polygons).
- Dark backgroundCheck the Invert Image box.