Image Processing And Edge Detection App (MATLAB App Designer)

Objective :-

This project is a MATLAB App Designer–based Image Processing and Edge Detection Application that allows users to load, filter, and analyze images using various edge detection techniques. The app provides an intuitive GUI for applying filters, adjusting parameters, and visualizing results in real time ,making it useful for beginners, students, and researchers working in image processing and computer vision.

Key Features :-

1. Image Loading & Display

   - Load images in common formats (PNG, JPG, JPEG, BMP).
   - Side-by-side visualization of original and processed images.

2. Filtering Options

   - Low Pass Filter
   - High Pass Filter
   - Gaussian Blur Filter
   - Median Filter
   - Sharpen Filter

3. Edge Detection Methods

   - Sobel
   - Prewitt
   - Canny
   - Roberts

4. Additional Functionalities
   - Adjustable kernel sizes for enhanced control (3×3, 5×5, 7×7).
   - Adjustable threshold slider for fine tuning.
   - Dynamic plotting of processed output.
   - Reset image to original.
   - Save processed output to local storage.
   - Clean and user-friendly UI built using MATLAB App Designer.

Requirements :-

MATLAB R2021a or newer versions.

How to Run :-

1. Open MATLAB.
2. Navigate to the cloned repository.
3. Open the file image123.mlapp in MATLAB App Designer.
4. Click on the Run button in App Designer.
5. Once the app opens, you can start loading images and applying filters.