Mcahine Vision HW6 Report

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Dependencies

```
python = ">=3.9,<4"
opencv-python = "^4.9.0.80"
alive-progress = "^3.1.5"
```

Run

```
python 110590004_hw6.py
```

Question 1

Canny Edge Detector

- Implement Canny edge detector.

Step 1 Noise Reduction

- Apply a Gaussian filter to smooth the image in order to reduce noise. Using kernel size 5x5 and sigma 0.9.

Step 2 Finding Intensity Gradient of the Image

- Use Sobel operator to calculate the gradient and direction of each pixel.

Step 3 Non-maximum Suppression

- Thin the edges by removing pixels that are not considered to be part of an edge.

Step 4 Double Threshold

- Use two thresholds to determine potential edges.

Step 5 Edge Tracking by Hysteresis

- Track edges by hysteresis: pixels that are weak and not connected to strong edges are removed.

Result

- The result of Canny edge detector is shown below.