

# Computer Vision — Homework 9

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## 1 Robert's Operator (with threshold: 12)

Code: Calculate Gradient magnitude.



Robert's Operator

## 2 Prewitt's Edge Detector (with threshold: 24)

Code: Calculate Gradient magnitude.



Prewitt's Edge Detector

### 3 Sobel's Edge Detector (with threshold: 38)

Code: Calculate Gradient magnitude.



Sobel's Edge Detector

### 4 Frei and Chen's Gradient Operator (with threshold: 30)

Code: Calculate Gradient magnitude.



Frei and Chen's Gradient Operator

## 5 Kirsch's Compass Operator (with threshold: 135)

Code: 用八個 3x3 的 mask 對影像做卷積，拿最大值與 threshold 做比較。



Kirsch's Compass Operator

## 6 Robinson's Compass Operator (with threshold: 43)

Code: 用八個 3x3 的 mask 對影像做卷積，拿最大值與 threshold 做比較。八個 3x3 的 mask 中會得到四組正負相反的數字，因為只要拿最大值與 threshold 做比較，因此只做四個 3x3 的 mask，再對得到的結果做絕對值。因為有每組數字都會有正負兩個，正值一定會比負值大，所以不管 mask 做出來的結果是正數還是負數，取絕對值後的值一定是這組正負兩個數字中較大的那個。四組數字都取較大的數字放進 list 之後再挑出最大的值與 threshold 做比較。



Robinson's Compass Operator

## 7 Nevatia-Babu 5x5 Operator (with threshold: 12500)

Code: 用六個 5x5 的 mask 對影像做卷積，拿最大值與 threshold 做比較。



Nevatia-Babu 5x5 Operator