Report

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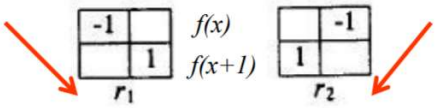
Robert's Operator: 12

$f'(x) \approx f(x+1) - f(x)$



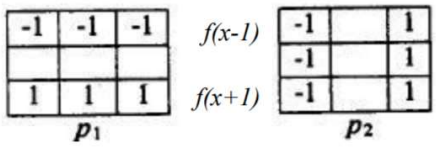
gradient magnitude: $\sqrt{r_1^2 + r_2^2}$

```
void Roberts_operator(Mat &img, Mat src, int threshold)
```

Use the above way to count and threshold is 12.

Prewitt's Edge Detector: 24

$f'(x) \approx f(x+1) - f(x-1)$ **Threshold=24**



gradient magnitude: $\sqrt{p_1^2 + p_2^2}$

```
void Prewitt_operator(Mat &img, Mat src, int threshold)
```

Use the above way to count and threshold is 24

Sobel's Edge Detector: 38

Sobel operator (ppt p.84)

$f'(x) \approx f(x+1) - f(x-1)$ **Threshold=38**

-1	-2	-1	$f(x-1)$
1	2	1	$f(x+1)$

s_1

-1		1
-2		2
-1		1

s_2

gradient magnitude: $\sqrt{s_1^2 + s_2^2}$

```
void Sobel_operator(Mat &img, Mat src, int threshold)
```

Like Prewitt's Edge Detector just only change the matrix. Threshold is 38.

Frei and Chen's Gradient Operator: 30

(ppt p.87) Threshold=3(

$f(x-1)$	-1	$-\sqrt{2}$	-1
$f(x+1)$	1	$\sqrt{2}$	1

f_1

-1		1
$-\sqrt{2}$		$\sqrt{2}$
-1		1

f_2

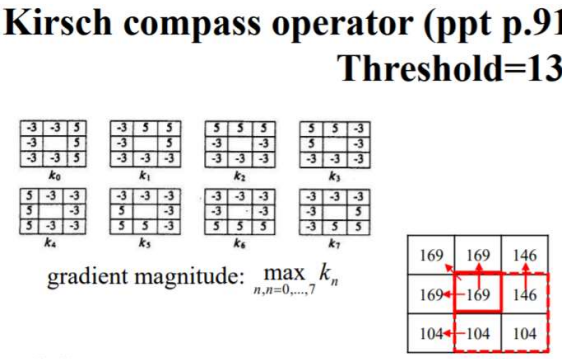
gradient magnitude: $\sqrt{f_1^2 + f_2^2}$ $f'(x) \approx f(x+1) - f(x-1)$

```
void FreiChen_operator(Mat &img, Mat src, int threshold)
```

Like Prewitt's Edge Detector and Sobel's Edge Detector.

Also change the 3X3matrix. Threshold is 30.

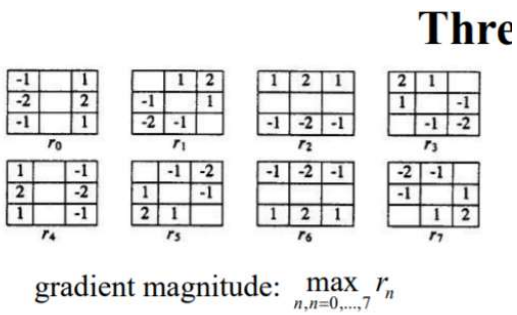
Kirsch's Compass Operator: 135




```
void Kirsch_operator(Mat &img, Mat src, int threshold)
```

The 3x3 matrix to find max, this function is force to count the 3x3 matrix and find the max result. Threshold is 135.

Robinson's Compass Operator: 43



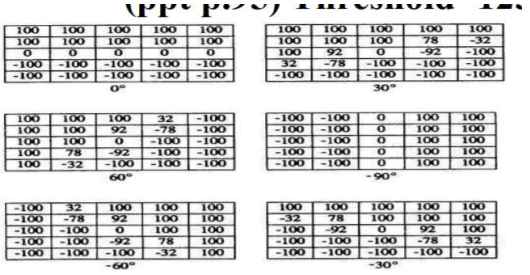

```
void Robinson_operator(Mat &img, Mat src, int threshold)
```

The 3x3 matrix to find max, this function I use following way.

```
int r[8] = { 0, 0, 0, 1, 2, 2, 2, 1 };
int c[8] = { 0, 1, 2, 2, 2, 1, 0, 0 };
```

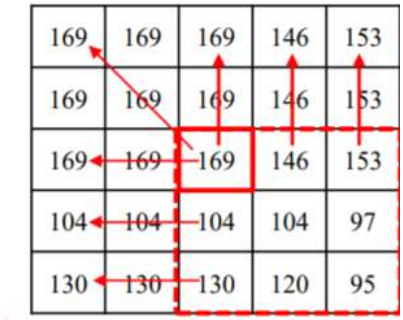
And then use a loop to count max. Threshold is 43.

Nevatia-Babu 5x5 Operator: 12500




```
void NevatiaBabu_operator(Mat &img, Mat src, int threshold)
```

The 5x5 matrix I use 6 arrays to store and the image's 5x5 matrix I force to count by following way.



Threshold is 12500.