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Sheet #3

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① $$M = \begin{bmatrix} \Sigma(I_x^2) & \Sigma(I_x I_y) \\ \Sigma(I_x I_y) & \Sigma(I_y^2) \end{bmatrix}$$

$$Q = |M| - \alpha \, trace(M)^2$$

$$|M| = (\Sigma(I_x^2) * \Sigma(I_y^2) - (\Sigma I_x * I_y))^2$$

$$trace(M) = \Sigma(I_x^2) + \Sigma(I_y^2)$$

$$\Sigma(I_x^2) = 0+0+0+4+2.25+4+4+0.4+0.01$$
$$= 0 + 10.25 + 4.05 = 14.3$$

$$\Sigma(I_y^2) = 8.83$$

$$\Sigma(I_x * I_y) = 5.15$$

$$M = \begin{bmatrix} 14.3 & 5.15 \\ 5.15 & 8.83 \end{bmatrix}$$

$$det(M) = 99.7465$$

$$trace = 23.13$$

$$Q = 99.7465 - 0.06 \times 23.13 = 67.64$$

Q > threashold # Corner Candidate

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(2) $det(M_1) = 5$
$trace(M_1) = 10.5$

$Q_1 = 0.59$

$det(M_2) = 49$
$trace(M_2) = 14$

$Q_2 = 37.16$

$det(M_3) = 0.001$
$trace(M_3) = 0.06$

$Q_3 = 0.000804$

$det(M_4) = 2$
$trace(M_4) = 20.1$

$Q_4 = -14.1616$

$M_1 \longrightarrow$ Corner

$M_2 \longrightarrow$ Vertical edge

$M_3 \longrightarrow$ Horizontal edge

$M_4 \longrightarrow$ Corner

(3) When $\alpha \approx r$:

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(4) $\sigma = 10$

at (3,3) local maxima

17	15	15
16	(18)	17
14	14	17

Maximum Value is 18 in the whole response

at (3,7)

not local maxima

11	12
10	(11)
15	15

$\sigma = 6$

(3,3) → local maxima

29	25	24
28	(30)	25
28	29	25

30 is the max of all the response

(3,7) → not local maxima

30	29
28	(28)
30	29

$\sigma = 3$, (3,3) → local maxima

22	21	20
24	(25)	22
24	21	20

(3,7) → not local

23	23
25	(21)
20	20

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