

$$\begin{matrix} I(x+1, y), I(x-1, y) \\ I(x, y+1), I(x, y-1) \end{matrix}$$

$$d_x, d_y$$

$$\text{quadrant II} = \text{sign}(d_x) * \text{sign}(d_y)$$

$$|d_x|, |d_y|$$

$$\phi_1, \phi_2 = \begin{cases} 070, 090 & \text{if } 004 \times |d_y| \geq 011 \times |d_x| \\ 050, 070 & \text{if } 073 \times |d_y| \geq 087 \times |d_x| \\ 030, 050 & \text{if } 168 \times |d_y| \geq 097 \times |d_x| \\ 010, 030 & \text{if } 017 \times |d_y| \geq 003 \times |d_x| \\ 170, 010 & \text{if others} \end{cases}$$

$$\begin{cases} |d_x| = B_{\phi_i} \times \cos(\theta_i) + B_{\phi_{i+1}} \times \cos(\theta_{i+1}) \\ |d_y| = B_{\phi_i} \times \sin(\theta_i) + B_{\phi_{i+1}} \times \sin(\theta_{i+1}) \end{cases}$$

$$\theta = \begin{cases} 180 - \theta & \text{if quadrant II} \\ \theta & \text{if others} \end{cases}$$

$$\theta_i, \theta_{i+1}, B_{\phi_i}, B_{\phi_{i+1}}$$