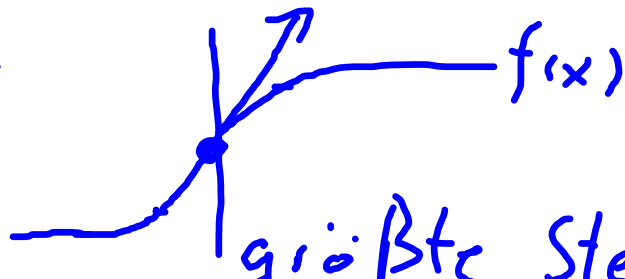
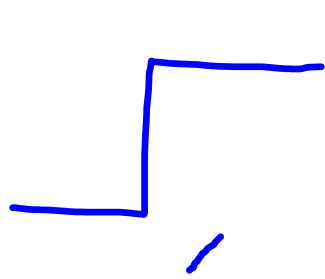


Kanten : Wie detektieren?

1D



$$\frac{\partial f}{\partial x} = \text{Max}$$

$$\frac{\partial f}{\partial x} \approx \frac{0 \cdot f(x-1) - f(x) + f(x+1)}{1}$$

$$\text{oder } \frac{-f(x-1) + f(x) + 0 \cdot f(x+1)}{1}$$

Addieren

$$\begin{bmatrix} 0 & -1 & 1 \end{bmatrix} + \begin{bmatrix} -1 & 1 & 0 \end{bmatrix}$$
$$\begin{bmatrix} -1 & 0 & 1 \end{bmatrix} \quad \boxed{\text{1D-Prewitt}}$$

Kante = Maximum 1. Ableitung

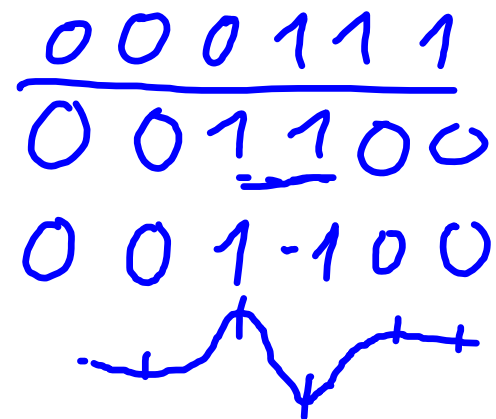
od. Nulldurchgang 2. Ableitung

$$\frac{\partial^2 f}{\partial x^2} \approx -(-f(x-1) + f(x)) + (-f(x) + f(x+1))$$

$$\nabla^2 = \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} \leftarrow \text{Laplace-Op}$$

$[1 \ -2 \ 1]$ 1D-Laplace

$$\begin{array}{l} [1 \ 0 \ 1] \\ [1 \ -2 \ 1] \end{array} \begin{array}{cccccccc} 0 & 0 & 0 & 1 & 3 & 5 & 6 & 6 & 6 \\ 0 & 0 & 1 & 3 & 4 & 3 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 & -1 & 0 & 0 \end{array}$$



$$[-1 \ 0 \ 1]$$

2D

$$\begin{bmatrix} -1 & 0 & 1 \\ -1 & 0 & 1 \\ -1 & 0 & 1 \end{bmatrix}$$

x-Kante

2D-Prewitt-Operator

$$\begin{bmatrix} -1 & -1 & -1 \\ 0 & 0 & 0 \\ 1 & 1 & 1 \end{bmatrix}$$

y-Kante