Blatt 3: bis Do 30.4. in Kappe vor CG P43

Blatt 4: bis 8.5.

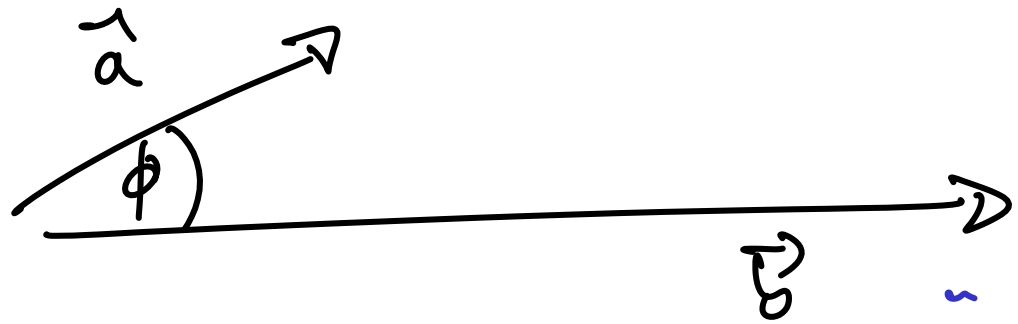
$$r_{xy} = \frac{s_{xy}}{s_x s_y}$$

$$s_{xy} = \frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})$$

$$s_x = \sqrt{\frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})^2} \qquad \text{analog } s_y$$

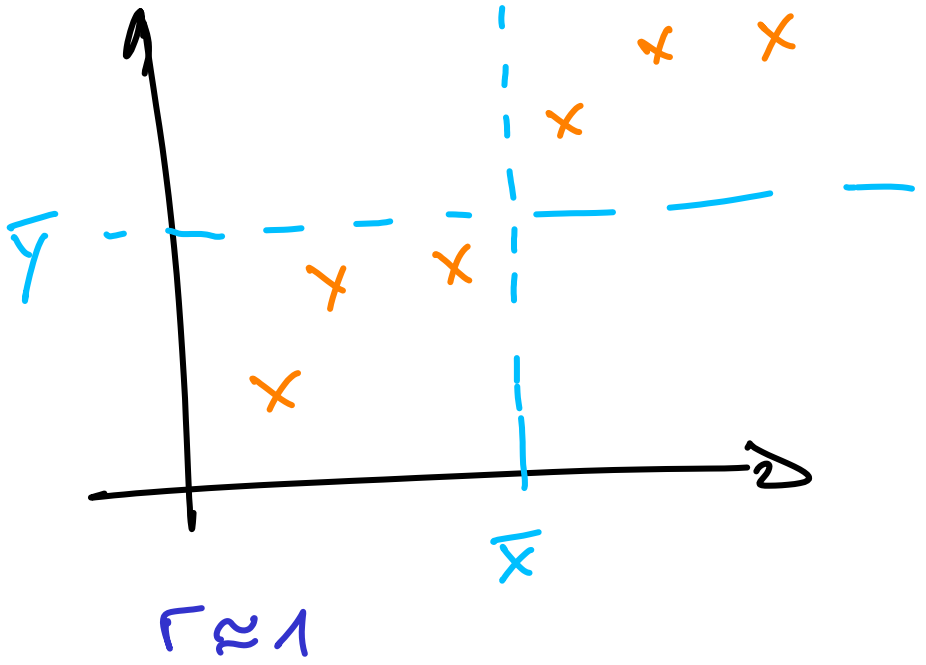
$$r_{xy} = \frac{\frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\left(\frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})^2\right) \cdot \left(\frac{1}{n-1} \sum_{i=1}^{n} (y_i - \bar{y})^2\right)}}$$

$$\vec{a} = \begin{pmatrix} x_1 - \bar{x} \\ \vdots \\ x_n - \bar{x} \end{pmatrix}, \quad \vec{b} = \begin{pmatrix} y_1 - \bar{y} \\ \vdots \\ y_n - \bar{y} \end{pmatrix}$$

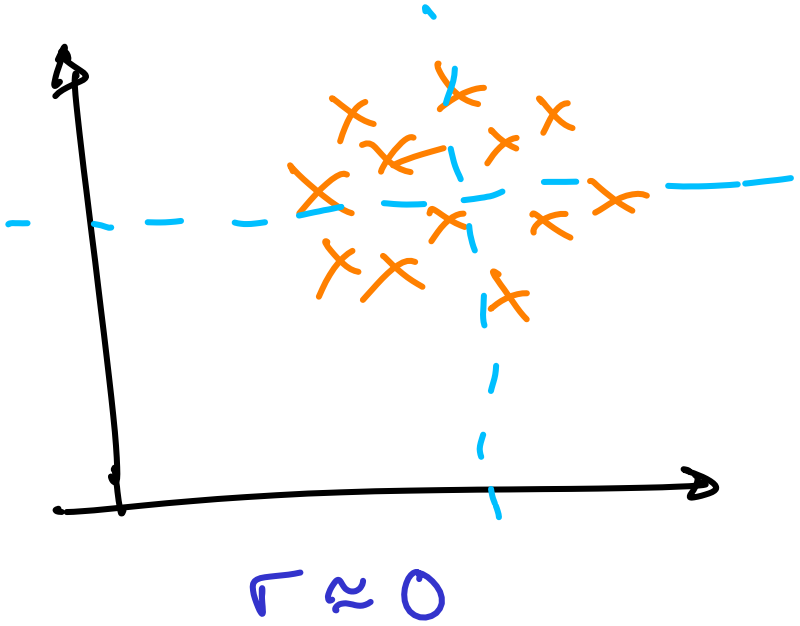


$$\cos\phi = \frac{\vec{a} \cdot \vec{b}}{|\vec{a}| \cdot |\vec{b}|} = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2} \cdot \sqrt{\sum_{i=1}^{n} (y_i - \bar{y})^2}}$$

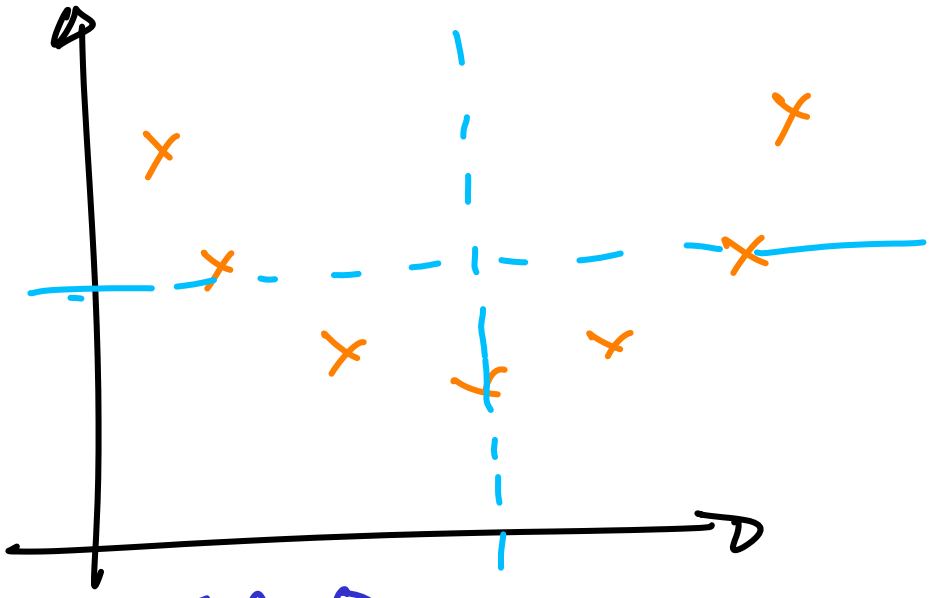
$$= r_{xy}$$



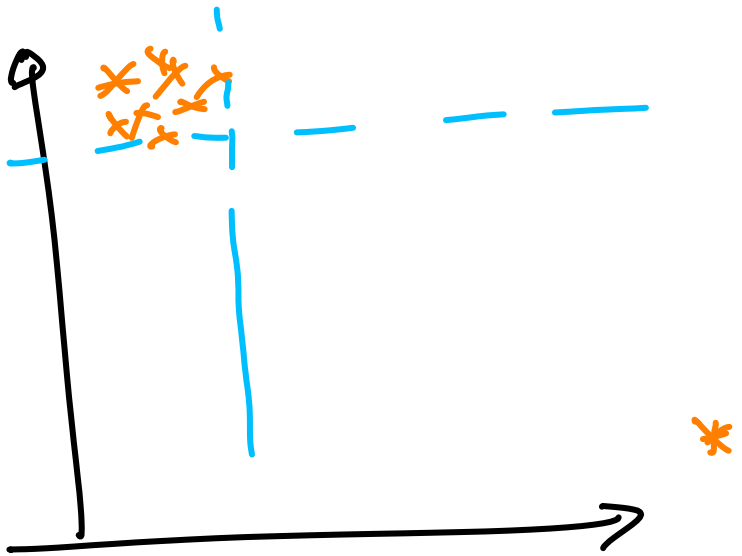
$r \approx 1$



$r \approx 0$

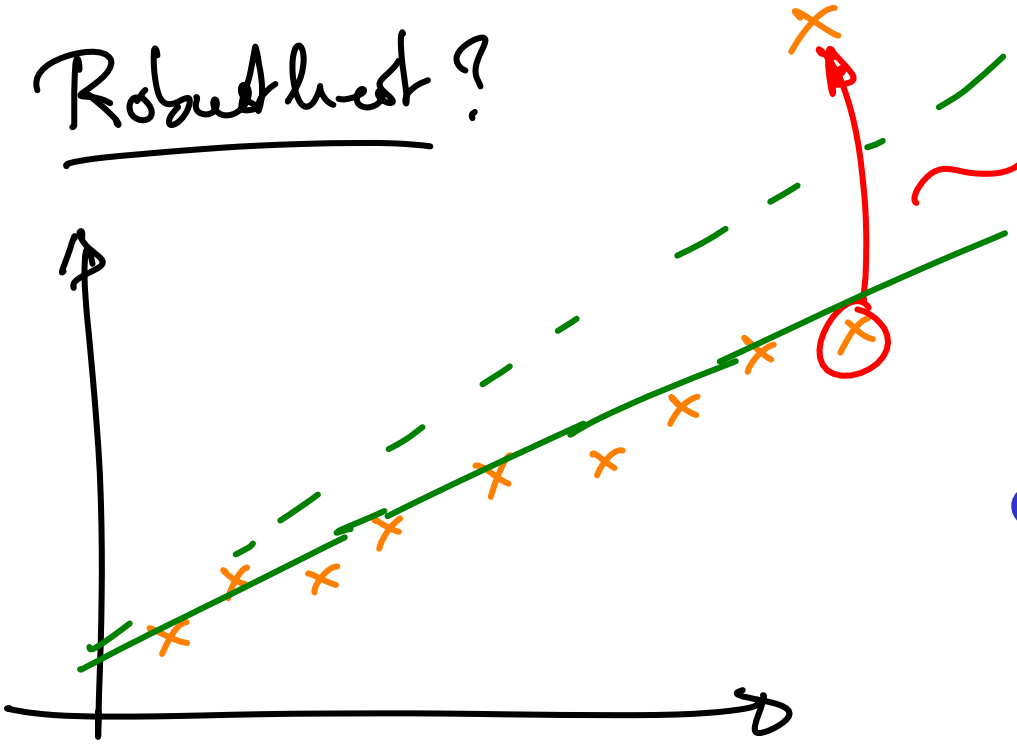


$r \approx 0$



$r \approx -1$

Robustheit?



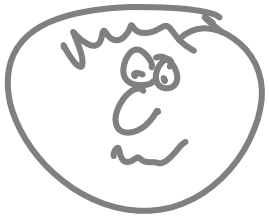
Messfehler

Korrelation sinkt

Regression ändert sich nicht

... etwas ganz anderes

faire Münze



Wahrscheinlichkeit $\frac{1}{2}$ $\frac{1}{2}$

Behauptung: Münze fair

wenn 3x : 3xK

wenn 10x : 3xK & 1xZ

Wahrscheinlichkeit für 3xK (in 3 Würfe)

falls Münze fair: $\frac{1}{8} = 12{,}5\%$

What for 9 × K (in 10 Würfe) bei fairer Münze

$$\frac{5}{512} \quad , \quad \frac{1}{1024} \quad , \quad \frac{1}{512}$$

$$\left(\frac{1}{2}\right)^9 \cdot \frac{1}{2} \cdot 10 = \frac{10}{2^{10}} = \frac{10}{1024} = \frac{5}{512} \approx 1\%$$