

$$1. a) \quad x_1 = f \cdot \frac{p_x}{p_z} \quad | \quad -x_2 = f \cdot \frac{(T - p_x)}{p_z}$$

$$d = x_1 - x_2 = f \cdot \frac{p_x}{p_z} + f \cdot \frac{(T - p_x)}{p_z} = \frac{f}{p_z} \cdot (p_x + T - p_x) =$$

$$= \frac{f \cdot T}{p_z}$$

$$Q_1: \quad d = (f \cdot T) \cdot \frac{1}{p_z}$$

inverse relation

Q<sub>2</sub>: object is close to the camera → disparity is large  
 object is far → disparity is small.

$$1. c) \quad f = 0,25 \text{ cm}$$

$$T = 12 \text{ cm}$$

$$p_x \text{ Num} = 648$$

$$\text{middle pix } x = 648 : 2 = 324$$

$$\text{pix width} = 7,4 \cdot 10^{-4} \text{ cm}$$

$$f \cdot T = 3 \text{ cm}^2$$

$$p_z = \frac{f \cdot T}{d} \quad d = x_1 - x_2$$

$$1. \quad x_1 = 550 - 324 = 226 \text{ pix}$$

$$x_2 = 300 - 324 = -24 \text{ pix}$$

$$d = 250 \text{ pix} = 0,185 \text{ cm}$$

$$(\text{cm} = \text{pix} \cdot \text{pix width})$$

$$p_z = \frac{3 \text{ cm}^2}{d} = 16,216 \text{ cm} = 0,16216 \text{ m}$$

$$2. \quad x_1 = 226 \text{ pix}$$

$$x_2 = 540 - 324 = 216 \text{ pix}$$

$$d = 10 \text{ pix} = 7,4 \cdot 10^{-3} \text{ cm}$$

$$p_z = \frac{3 \text{ cm}^2}{d} = 405,405 \text{ cm} = 4,05405 \text{ m}$$



2.a)

$$\text{col} = 0 = x = u$$

~~$$\text{row} = 0 =$$~~

$$\text{row} = 2 = y = v$$

1. ~~aff~~

$$x = \begin{bmatrix} 0 \\ 2 \\ 1 \end{bmatrix}$$

$$F_x = \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix} \Rightarrow y - 1 = 0$$

2.

$$x = u = 1$$

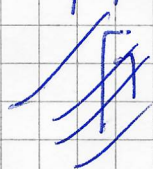
$$y = v = 0$$

$$x = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$$

$$F_x = \begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}$$

$$\Rightarrow x - 1 = 0$$

Epipole:



Where they intersect.

$$x = 1, y = 1 \quad e = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$