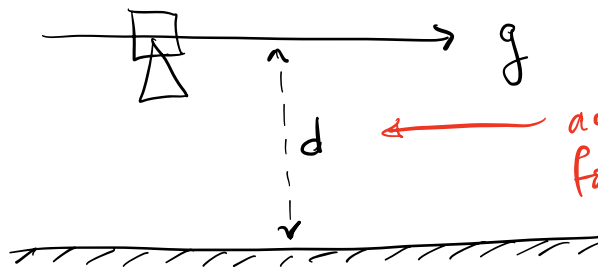# Single Moving Camera example

→ g

← assume this is constant for simplicity

d

Dynamics

$$x = \begin{bmatrix} g \\ d \end{bmatrix}$$

$$\dot{x} = \begin{bmatrix} u \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix} + \begin{bmatrix} 1 \\ 0 \end{bmatrix} u$$

$\underset{f_d(x)}{\uparrow} \quad \underset{f_u(x)}{\uparrow}$

$$\dot{x} = f_d(x) + f_u(x) \cdot u$$

System is linear, so we can also write:

$$= \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} x + \begin{bmatrix} 1 \\ 0 \end{bmatrix} u$$

Measurement

$y = $ optic flow
i.e.
image angular velocity

$$= \begin{bmatrix} g/d \end{bmatrix}$$