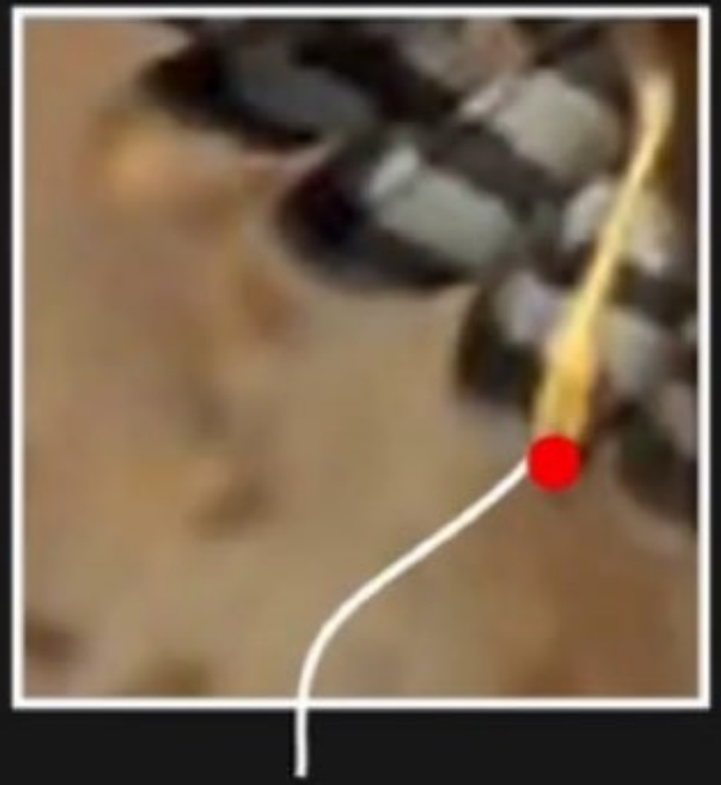


$I(x, y, t)$

$I(x + \delta x, y + \delta y, t + \delta t)$

Assumption #1:

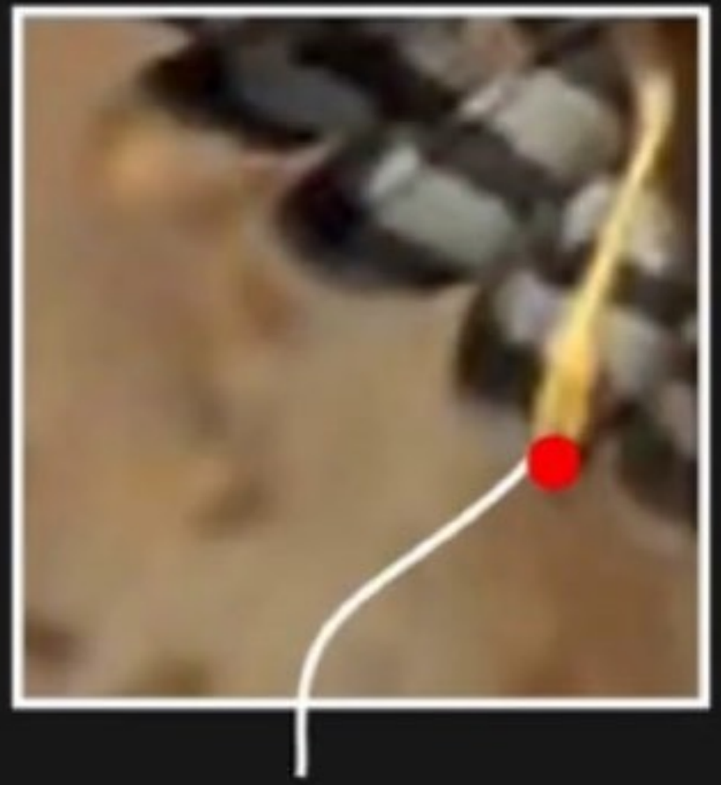
Brightness of image point remains constant over time

$$I(x + \delta x, y + \delta y, t + \delta t) = I(x, y, t)$$

Assumption #2:

Displacement $(\delta x, \delta y)$ and time step δt are small

$$I(x+\delta x, y+\delta y, t+\delta t) = I(x,y,t) + \frac{\partial I}{\partial x}\delta x + \frac{\partial I}{\partial y}\delta y + \frac{\partial I}{\partial t}\delta t$$



$I(x, y, t)$

$I(x + \delta x, y + \delta y, t + \delta t)$