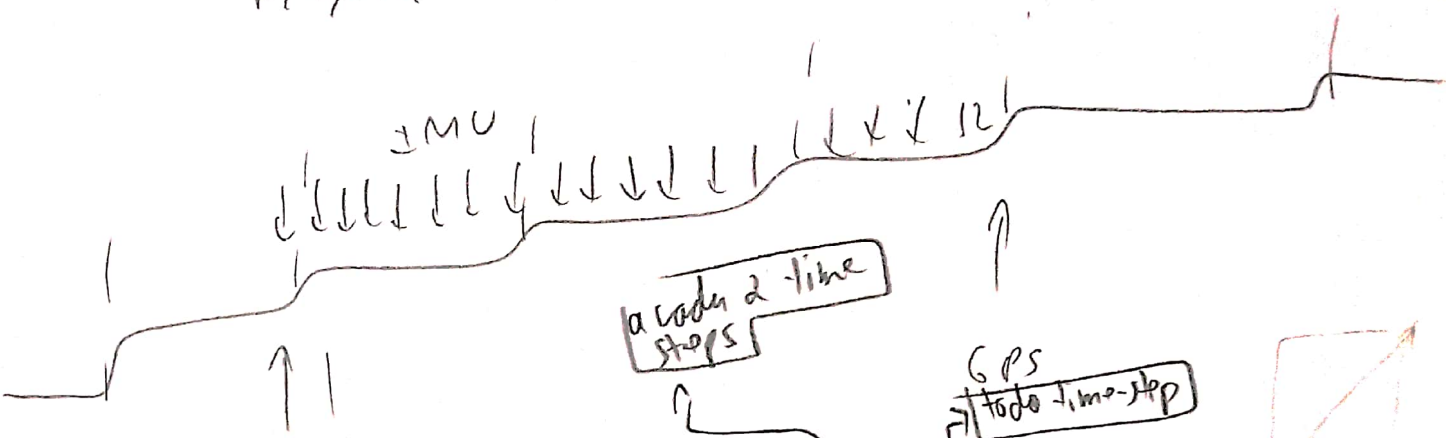
ZOH pydyna



assuming calibrated sensors

GPS: 10 Hz
IMU: 2000 Hz

$2x^2 = y^2$
$x = \sqrt{\frac{y^2}{2}}$

r error:

$$\sigma^2 = \left[\frac{0{,}3 \cdot \sqrt{\frac{0.1}{3600}}}{0.1}\right]^2 = 0{,}00025$$

(std of ψ/GPS) (bias in-run stability) (calibrated)

IMU

$\mu = 0$

IMU

$z_{95\%} = 1{,}96$
$z_{63\%} = 1$
$z_{50\%} = 0{,}674$

GPS ψ error

$\sigma^2 = 9^\circ \to 0{,}15709$ rad (heading arc)

$\mu = 0$

→ assuming 0 covariances and same variances

factor = $\frac{z_{63\%}}{z_{95\%}}$

GPS X, Y errors

$$\sigma^2 = \left(\sqrt{\frac{5^2}{2}}\right)^2 = \frac{5^2}{2} = 12{,}5$$ (horizontal arc)

$\mu = 0$

$$\sigma = \frac{5 \cdot \left(\frac{1}{0{,}674}\right)}{2}$$

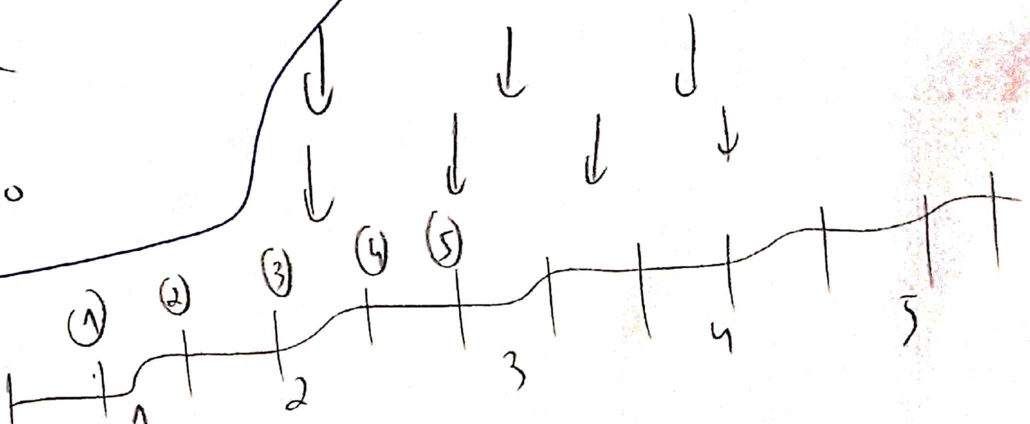
factor = $\frac{0{,}43}{1{,}66}$

=

V, M error

$\sigma^2 =$

$\mu = 0$



$$\sigma_{\dot{x}} = \sqrt{\sigma_x^2 + \sigma_x^2} = \sqrt{2}\,\sigma_x \quad (1)$$

$$\sigma_{\dot{y}} = \sqrt{2}\,\sigma_y$$

$$\begin{bmatrix} u \\ v \end{bmatrix} = \begin{bmatrix} \cos\psi & \operatorname{sen}\psi \\ \operatorname{sen}\psi & -\cos\psi \end{bmatrix} \begin{bmatrix} \dot{x} \\ \dot{y} \end{bmatrix} \quad (2)$$

x e y tem invertido aqui KKK

$$u = \dot{x}\cos\psi + \dot{y}\operatorname{sen}\psi$$

$$v = \dot{x}\operatorname{sen}\psi - \dot{y}\cos\psi$$

$$\sigma_u = \sqrt{(\cos\psi \cdot \sigma_{\dot{x}})^2 + (\operatorname{sen}\psi\,\sigma_{\dot{y}})^2 + [(\dot{y}\cos\psi - \dot{x}\operatorname{sen}\psi)\cdot\sigma_\psi]^2}$$