State Estimation

(Flight Path Reconstruction)

bias λ

noise $\mathbf{w}$

noise $\mathbf{v}$

$$\mathbf{u_m} = \mathbf{u} + \lambda + \mathbf{w}$$

Measured input vector

$$\dot{\mathbf{x}} = f(\mathbf{x}(t), \mathbf{u_m}(t))$$

Aircraft Kinematic Model

$$\mathbf{z_m} = h(\mathbf{x}(t), \mathbf{u_m}(t), \mathbf{v}(t))$$

Observation Model

(Iterative) Extended Kalman Filter

$\hat{\mathbf{x}}$ (state estimate)

Corrected Measurements

$$\mathbf{z} = h(\hat{\mathbf{x}}, \mathbf{u_m})$$

Aerodynamic Parameter Estimation

Aerodynamic forces and moments

Parameter estimates $\hat{\theta}$

LS Parameter Estimator