Meeting

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Progress report

- Training the controller on numerical environment.
- The time system between XPlane and Python is asynchronous.
- Study about likelihood function.

Training result

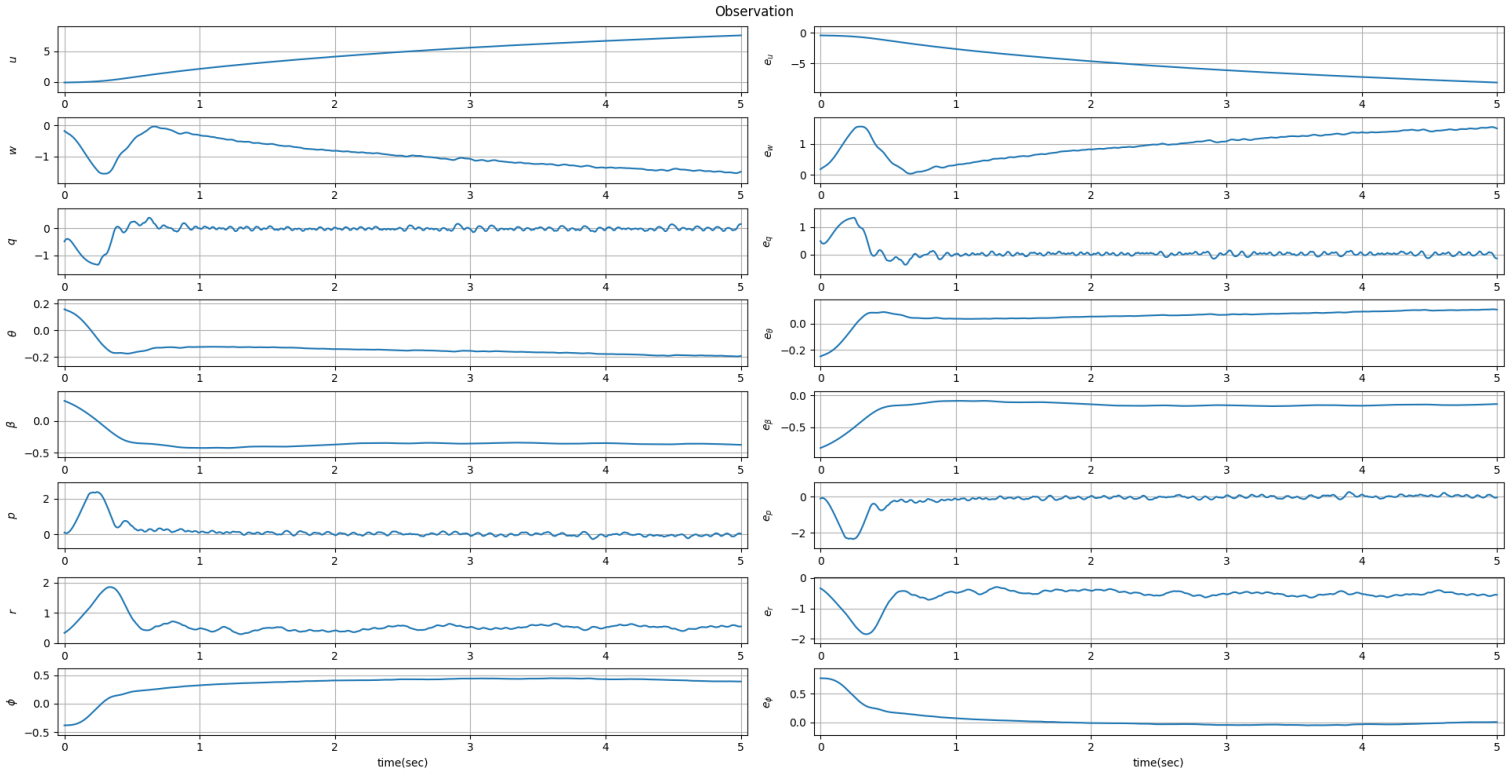

Figure 1: Training result

Training result

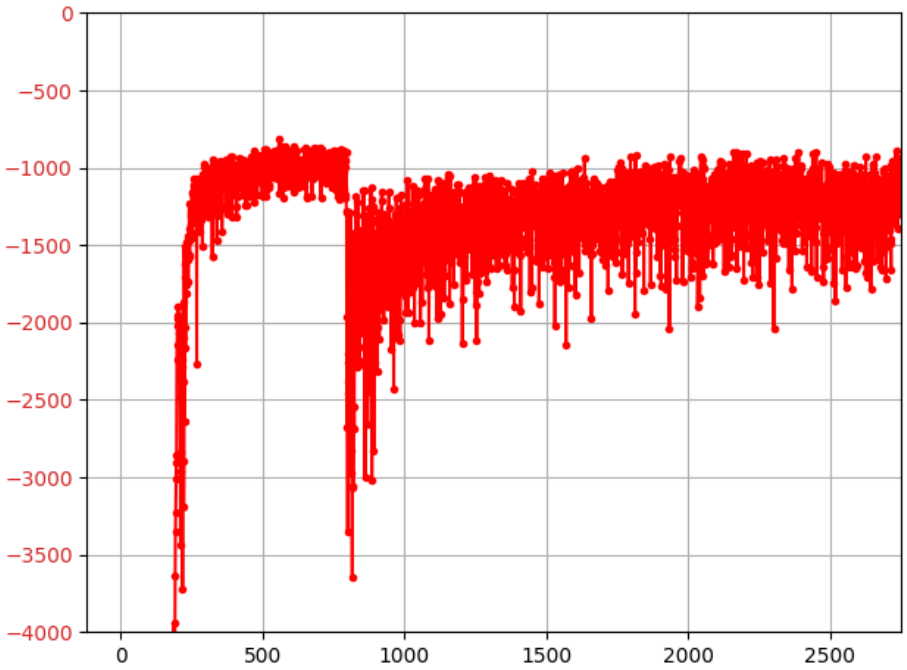

Figure 2: Mean trajectory reward

Training result

- Change the definition of $\bar{x}$ and $\bar{\delta}$
  - Old: $\bar{x} = \frac{x}{x_{\text{ref}}}$
  - Now: $\bar{x} = \frac{x}{||x||}$

$$r(t) = -\underbrace{A(1 - e^{-\frac{1}{\tau}t})}_{\text{Time factor function}} \underbrace{\left(\bar{x}^T Q \bar{x} + \bar{\delta}^T R \bar{\delta}\right)}_{\text{Quadratic function}} \tag{1}$$

likelihood function

The will be used to estimate how reliable an approximate probability model is. Similar to the mean square error for a linear regression.

$$\mathcal{L}(\theta|x) = f_\theta(x)$$

where x is a realization of random variable, and θ is the parameters of the probability distribution[1].

[1] For instance, in the case of the Normal distribution $\mathcal{N}(\mu, \sigma)$, the parameters μ and σ representing the mean and standard deviation, respectively, will be denoted by θ.

likelihood function

The different between PDF and Likelihood

- Probability density function $f(x|\theta)$

$$x \mapsto f(x|\theta)$$

- Likelihood function $\mathcal{L}(\theta|x)$

$$\theta \mapsto f(x|\theta)$$