

FCAI

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$$J(\pi; f) = \mathbb{E}_{\epsilon_{0:\infty}} \left[\sum_{t=0}^{\infty} \gamma^t r(s_t, a_t) \mid s_{t+1} = f(s_t, a_t) + \epsilon_t, a_t = \pi(s_t) \right]$$

RL objective:

Expectation over transition noise, i.e. aleatoric uncertainty

Posterior overdynamics models:

p(f|g)

How should we use this?

$$J(\pi; f) = \mathbb{E}_{\text{???}} \left[\sum_{t=0}^{\infty} \gamma^t r(s_t, a_t) \mid s_{t+1} = f(s_t, a_t) + \epsilon_t, a_t = \pi(s_t) \right]$$

Source of Uncertainty

Decision-making under uncertainty

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Stochastic dynamics



Return = discounted sum of rewards



Deterministic policy





What is the expectation over?

Sources of Uncertainty

Decision-making Under Uncertainty

RL objective:

$$J(\pi; f) = \mathbb{E}_{\epsilon_{0:\infty}} \left[\sum_{t=0}^{\infty} \gamma^t r(s_t, a_t) \mid s_{t+1} = f(s_t, a_t) + \epsilon_t, a_t = \pi(s_t) \right]$$

Expectation is over transition noise, i.e. aleatoric uncertainty

Posterior over dynamics models:

$$p(f \mid \mathcal{D})$$

How should we use this?

Model Bias