

Add uncertainty

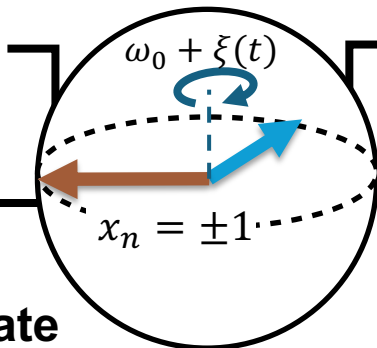
$$\sigma_n \rightarrow \sigma_n + \Delta\sigma_n$$



$$A_n \rightarrow (\{Est_\tau, Flip\}, \Delta\sigma)$$

Estimate
(select τ_n)

Flip
($\tau_n = 1/\mu_n$)



Bayesian update

$$\mu_{n-1}, \sigma_{n-1}, \tau_n, x_n \\ \rightarrow \mu_n, \sigma_n$$

Reward

$$r_n = 1 \text{ if } x_n = 1 \\ r_n = -p \text{ if } x_n = -1$$