

# Random Equations

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$$J^*(X(t)) = \min_{u(t)} \left\{ J^*(X(t+1)) + g(X(t), X(t+1)) - U_0 \right\}$$

Discrete-time system:

$$x_{k+1} = f(x_k, u_k, w_k) \quad \text{where } k = 0, 1, \dots, N-1$$

Cost function that is additive over time:

$$J_N = \mathbb{E} \left[ g_N(x_N) + \sum_{k=0}^{N-1} g_k(x_k, u_k, w_k) \right]$$