Basic Models for Robot Motion and Perception

Time and Transitions

Models of time

To describe how actions change the state, we need a model of **time**.

- **Discrete time**: Time is an integer k.

- **Continuous time**: Time is a real number t.

Transitions

A **state transition equation** describes how actions change the state.

Discrete time, deterministic:

$$x_{k+1} = f(x_k, u_k)$$

Continuous time, deterministic:

$$\dot{x} = f(x, u)$$

Transitions

A **state transition equation** describes how actions change the state.

Discrete time, with errors:

$$x_{k+1} = f(x_k, u_k, \theta_k)$$

Continuous time, with errors:

$$\dot{x} = f(x, u, \theta)$$