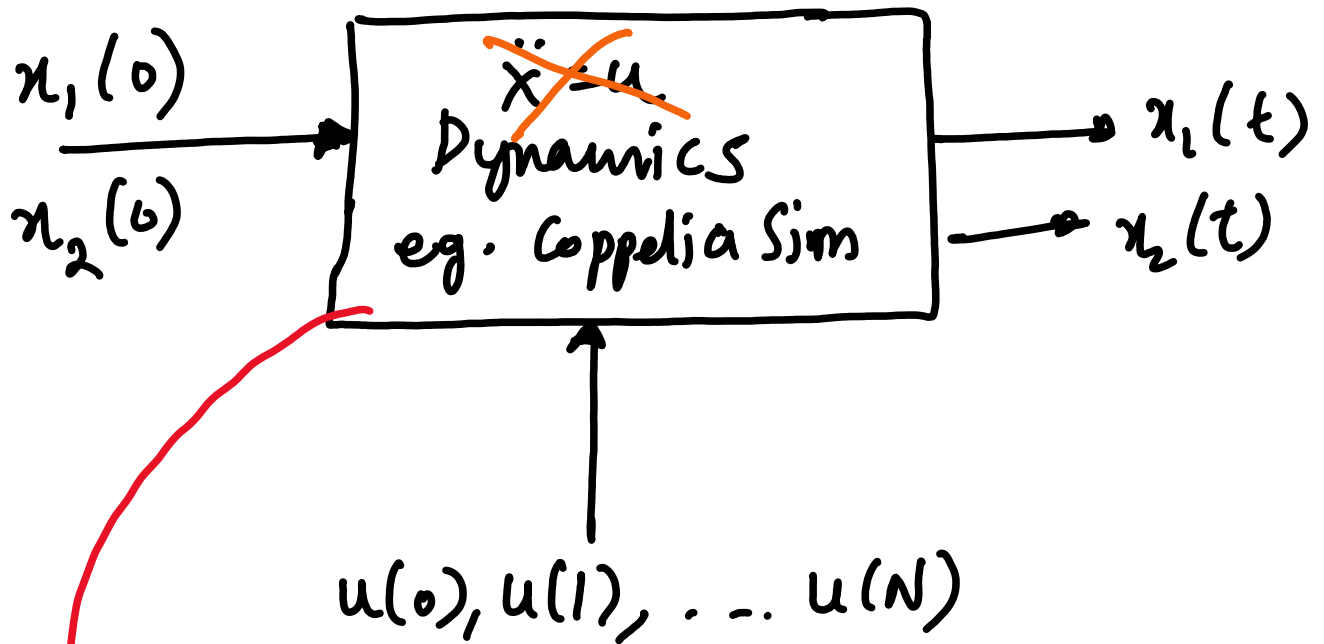


② Shooting method

- Treat the dynamics as a blackbox.



Equations are unavailable

(a) Optimization variables

(1) $T, u[0], u[1], \dots, u[N]$ $N+2$
 $\underbrace{\hspace{10em}}_{N+1}$

(b) Cost: T

(c) Constraints ($x_1 = \text{position}, x_2 = \text{velocity}$)

~~$x_1(0) = 0$~~ ~~$x_2(0) = 0$~~ initialized in the simulator.

$x_1(T) = D \checkmark$
 $x_2(T) = 0$ } 2 constraints

Optimization variables: $N+2$

Constraints: 2

Free variables $(N+2) - 2 = \underline{N}$