

Bryson Benchmark Problem

$$\min_u \frac{1}{2} \int_0^{t_f} x_1(t)^2 dt$$

$$s. t. \quad \frac{dx_1(t)}{dt} = u(t) + x_2(t)$$

$$\frac{dx_2(t)}{dt} = -u(t)$$

$$x(0) = [0.5, 0]$$

$$x(t_f) = [0, 0]$$

$$t_f = 1.5$$

$$-1 \leq u(t) \leq 1$$