MEM 733 Applied Optimal Control

Problem Set 2

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Consider the decent of the moon lander system:

$$\dot{h} = v$$

$$\dot{v} = -g + k\frac{u}{m}$$

$$\dot{m} = -u$$

The fuel flow rate u is used to steer the system to $h = 0, v = 0$. We wish to minimize the fuel used during landing, i.e.

$$J = \int_0^t u dt$$

The system is subject to the control constraint: $0 \le u \le c$, and the state constraint $h \ge 0$. Determine the optimal feedback control.