1 Magnetically suspended ball

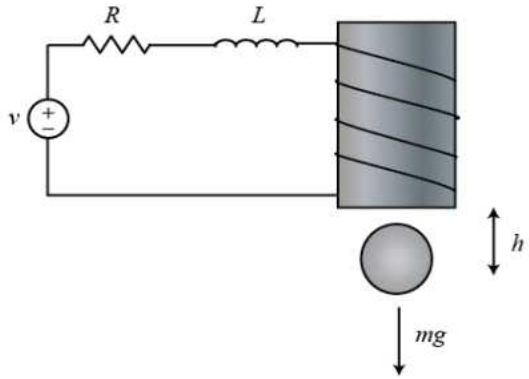

Figure 1: Magnetically suspended ball

The equations for the system are given by

$$M\frac{d^2h}{dt^2} = Mg - \frac{Ki^2}{h} \tag{1}$$

$$V = L\frac{di}{dt} + iR \tag{2}$$

where $M = 0.05Kg, K = 0.0001, L = 0.01H, R = 1Ohm, g = 9.81m/sec^2$.
The system is at equilibrium (the ball is suspended in midair) whenever $h = Ki^2/Mg$ (at which point dh/dt = 0). We linearize the equations about the point $h = 0.01m$ (where the nominal current is about 7 amp)