F=ma

In an inertial frame of reference, the vector sum of the forces $\mathbf{F}$ on an object is equal to the mass $m$ of that object multiplied by the acceleration $\mathbf{a}$ of the object: $\mathbf{F} = m\mathbf{a}$.

In their original form, Newton’s laws of motion are not adequate to characterize the motion of rigid bodies and deformable bodies. Leonhard Euler in 1750 introduced a generalization of Newton’s laws of motion for rigid bodies called Euler’s laws of motion.

—https://en.wikipedia.org/
The world’s smallest inverted pendulum---stabilized by vertical oscillation of the base.

Time constants, mass, and inertia come important
Suppose there are only two (finitely many) actions that can be taken:

- Jerk the cart left or right one centimeter
- Under what circumstances can one keep the pendulum upright using this very coarse type of “control?”
- Ans: If and only if there is a sufficiently high actiel rate.
Air Packets: 17 bytes payload

Air Packets: ≤ 366 bits total

G(s)
Distributed and asynchronous control under communication constraints

Key Problem:

• Combined control and data-compression

Control of boundary flow using distributed arrays of micro-jet actuators is one target application for use of communicating sensor/actuator networks.
Housekeeping

- Three people still need to sign up for presentation slots.
- Homework 6 is posted.
- Shout-out to Joanna Thelen