I) About myself

II) Prior experience falls:
- elasticity / beam theory
- circuitry
- fabrication
- Microlab experience

III) Conceptualizing the accelerometer example

IV) Introduction to elastic properties

Consider a cubical solid subjected to uniaxial tension:

\[ \varepsilon_x = \frac{I}{a^2 \cdot E} \]  - Young's modulus (1a)

\[ \varepsilon_y = \frac{e_t}{C_{xx}} \]  - Poisson's ratio (1)

Also: density \( \left( \frac{kg}{m^3} \right) \)

This will be covered in more detail later.
II) Introduction to vibration

Ex. 1) Slinged possible mechanical resonator:

\[ f_0 = \frac{1}{2\pi} \sqrt{\frac{k}{m}} \]

Some MEMS devices actually behave almost like this.

Ex. 2) "Guitar" string

"Stiffness": tension (T)
"Mass": line density (\( g_s \))

\[ f_0 = \frac{1}{2\pi} \sqrt{\frac{T}{g_s}} \]

Difficult to implement in MEMS.

Ex. 3) Beam (clamped-clamped)

Not the same differential equation:
"Stiffness": flexural stiffness
"Mass": line density

\[ f_0 = 1.03 \sqrt{\frac{E}{\rho}} \frac{b}{L^2} \]

No analytical solution.

This will also be covered in more detail later; don’t worry if you don’t really understand it.