6th Homework - Problems

- 6.1 Electrical Circuit
- 6.2 Cervical Syndrome

6.1 Electrical Circuit

- Given the following circuit:
6.1 Electrical Circuit

- The circuit is to be modeled using bond graphs.
- Use a sensor element together with a modulated source element to implement the non-linear current source in the circuit.
- Simulate the circuit during 50 µsec, and plot $v_3$ as a function of time.

6.2 Cervical Syndrome

- Create a bond graph for the model of the human body shown to the left.
- Simplify the bond graph using the diamond property.
Cervical Syndrome: Experiment

- We wish to apply a sinusoidal input to the force, $F$:
  \[ F = \sin (\omega_0 \cdot t) \]

- In our experiment, we wish to ramp up the frequency, thus:
  \[ \omega_0 = k \cdot t \]

- By plugging the latter equation into the former, we obtain:
  \[ F = \sin (k \cdot t^2) \]

- Set $k = 0.01$, and simulate during 100 sec. Use a sampling interval of 0.01 sec.