Goal

Simulate an arbitrary initial circumstance and see what happens

Constants

$k = 100$

$l_0 = 1$

$m = 1$

$g = 9.8$

Duration: 20s

Framerate: 25fps

Initial Values

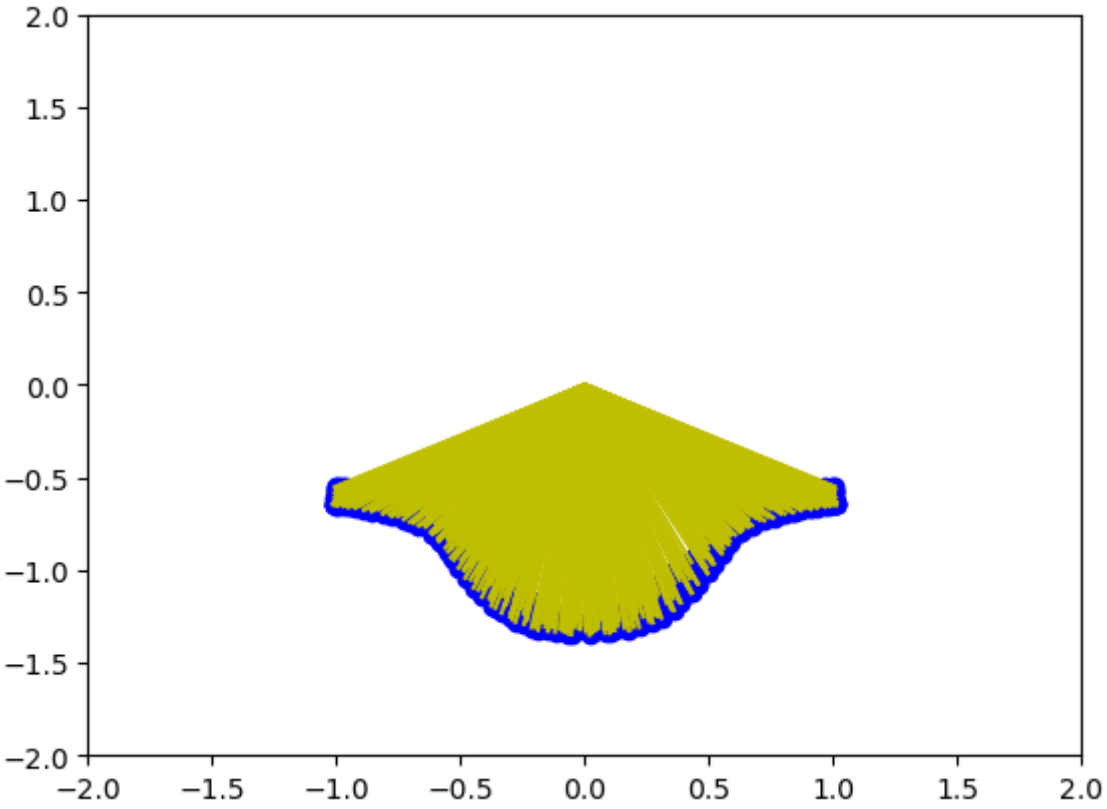
$l = 1.2$

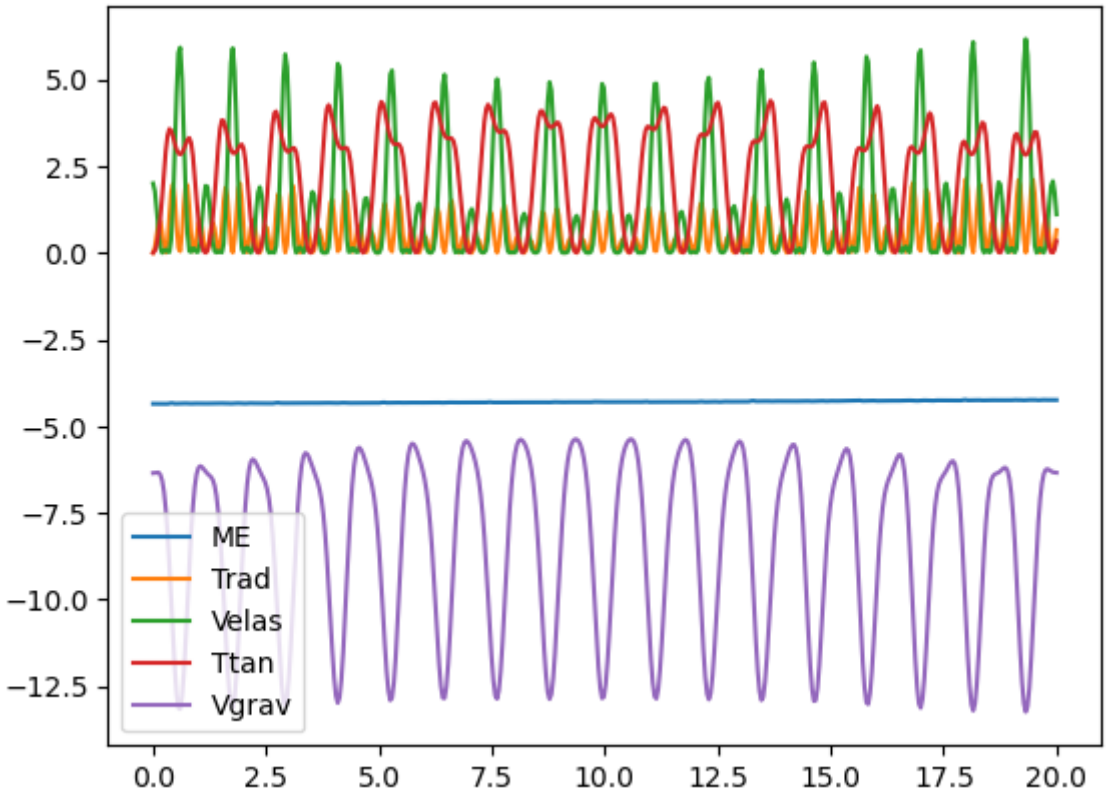
$\dot{l} = 0$

$\theta = 1$

$\dot{\theta} = 0$

Results





In which ME stands for mechanical energy, T_{rad} stands for radical kinetic energy, T_{tan} stands for tangential kinetic energy, V_{elas} stands for elastic potential energy, V_{grav} stands for gravitational potential energy.

The theoretical mechanic energy is -4.353955117009324 J

The average calculated mechanical energy is -4.300729771926146 J

The Root Mean Square Error of mechanical energy is 0.06163391174116638

the standard deviation of mechanical energy is 0.003870907691326819

Therefore the calculated energy is close enough to the theoretical energy, meaning the energy of this system conserves and the simulation has a high accuracy.