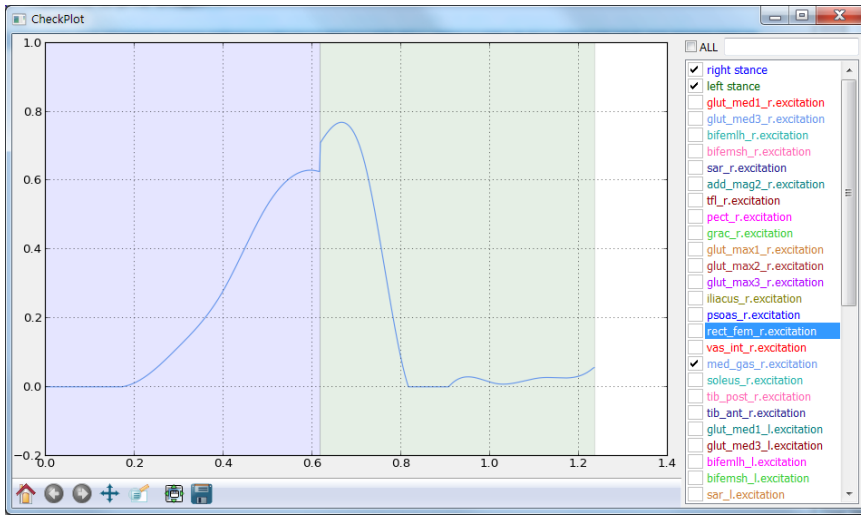
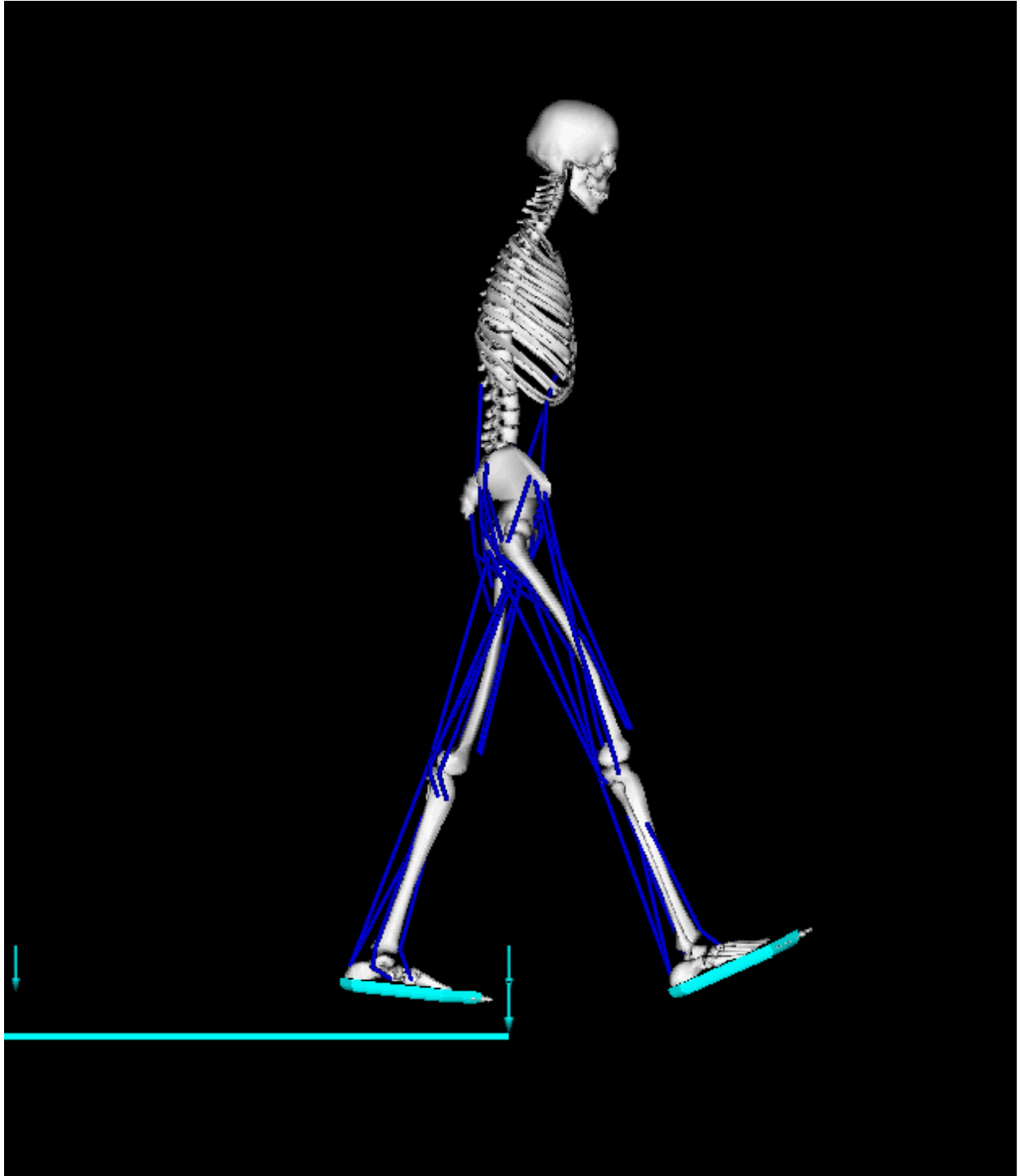


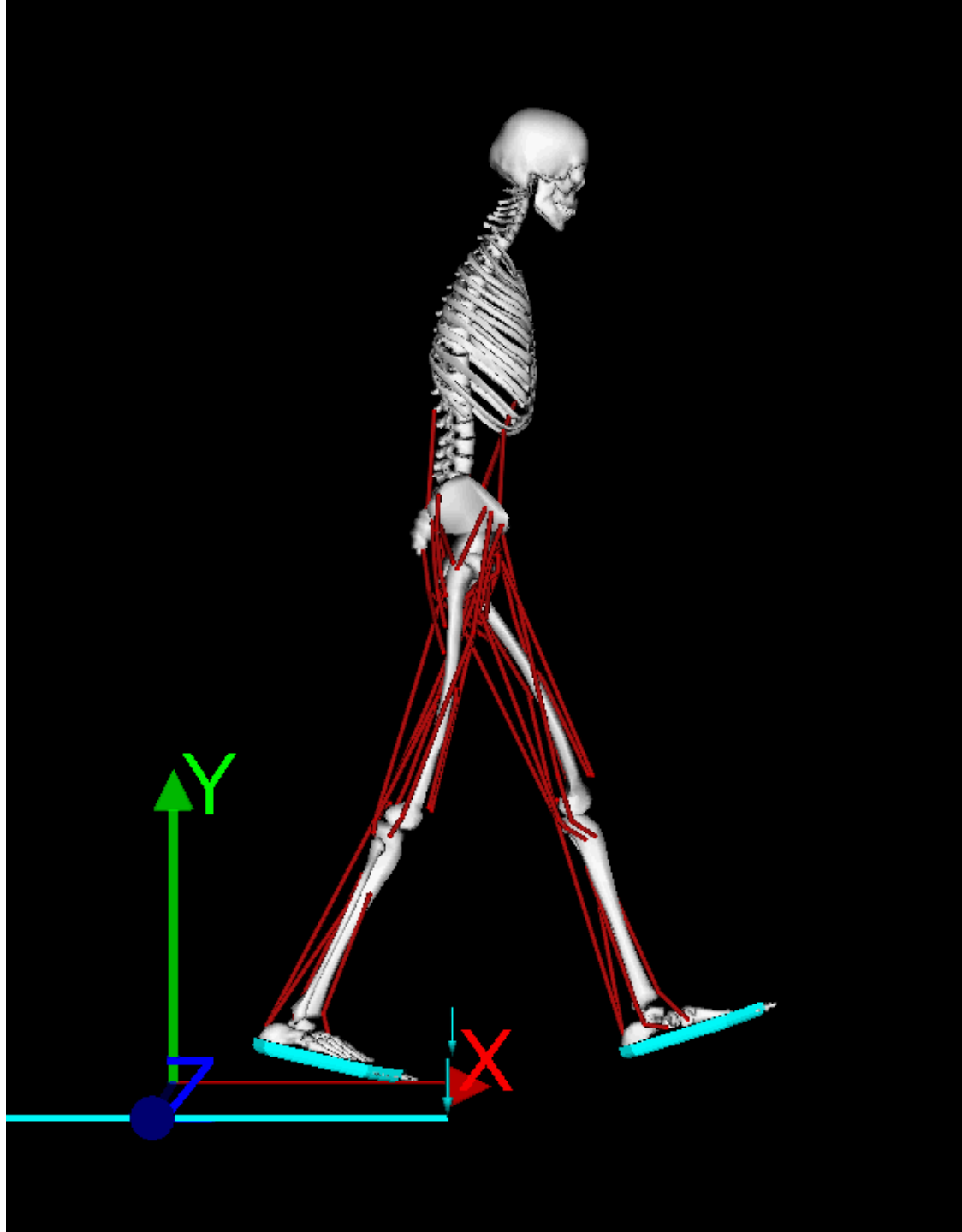
Progress Report

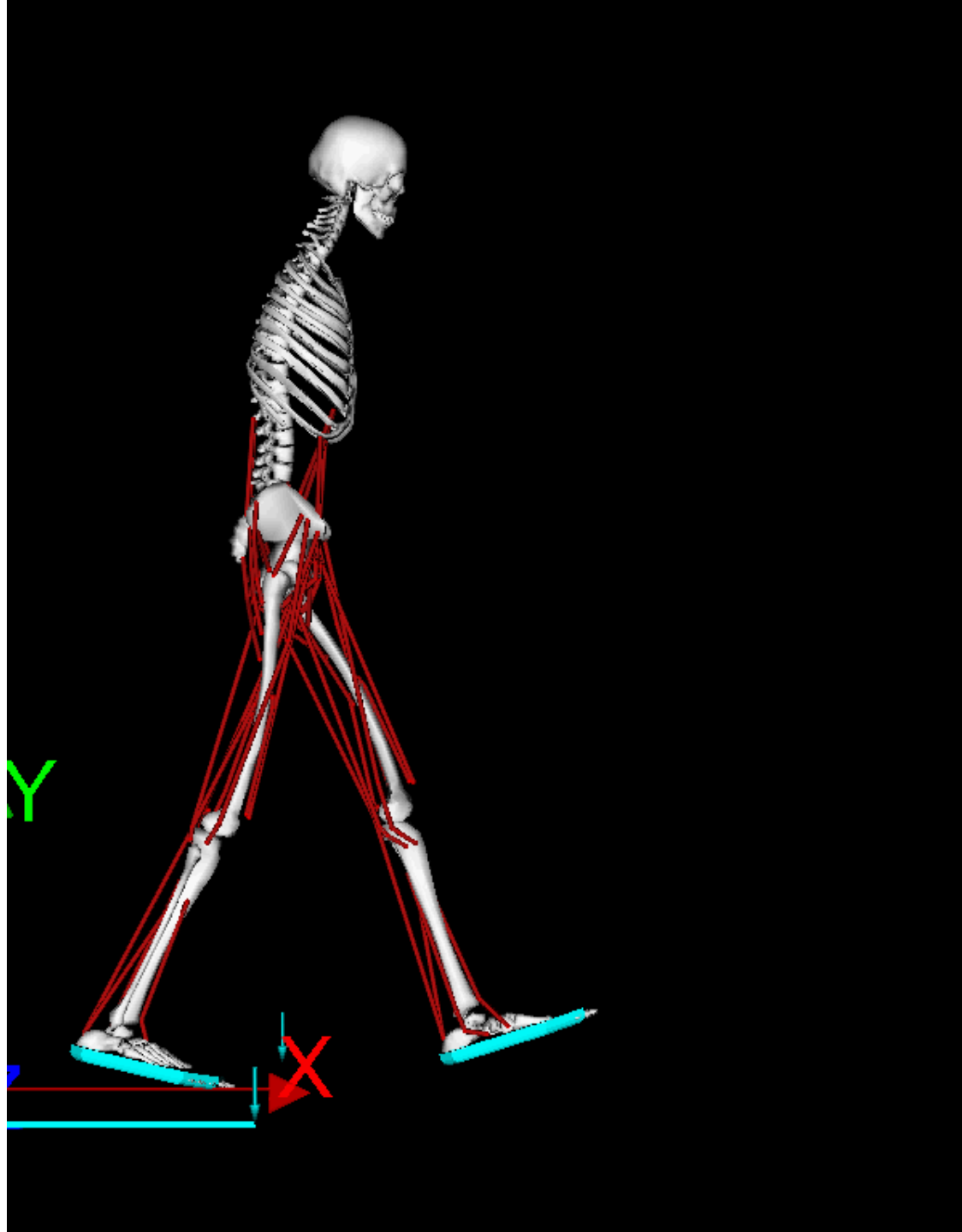
Yoonsang Lee,
Movement Research Lab.,
Seoul National University

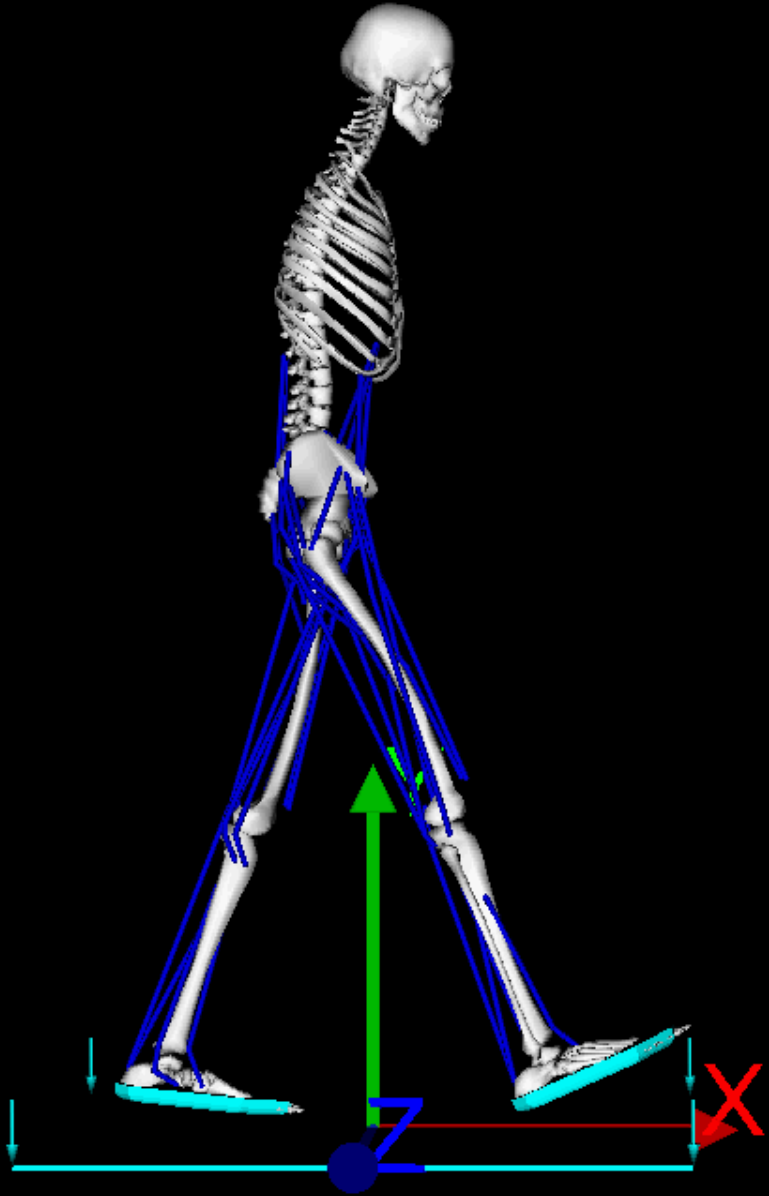
Reference Excitation





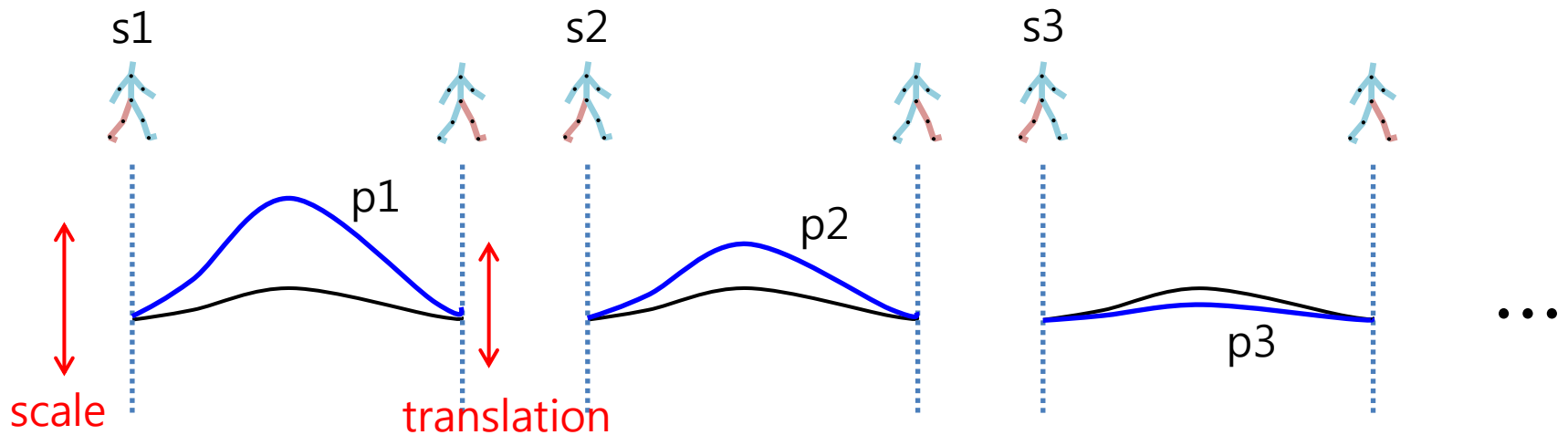


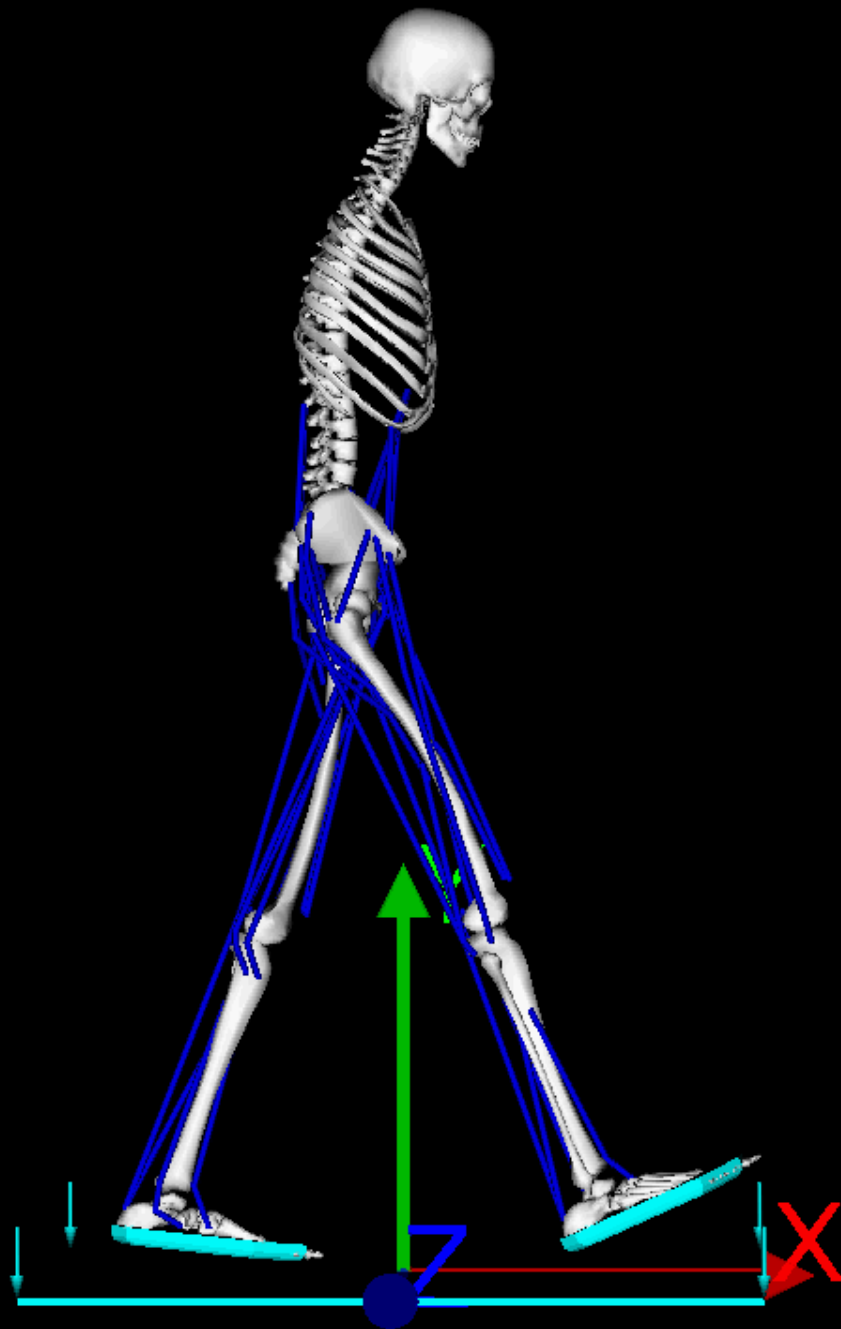


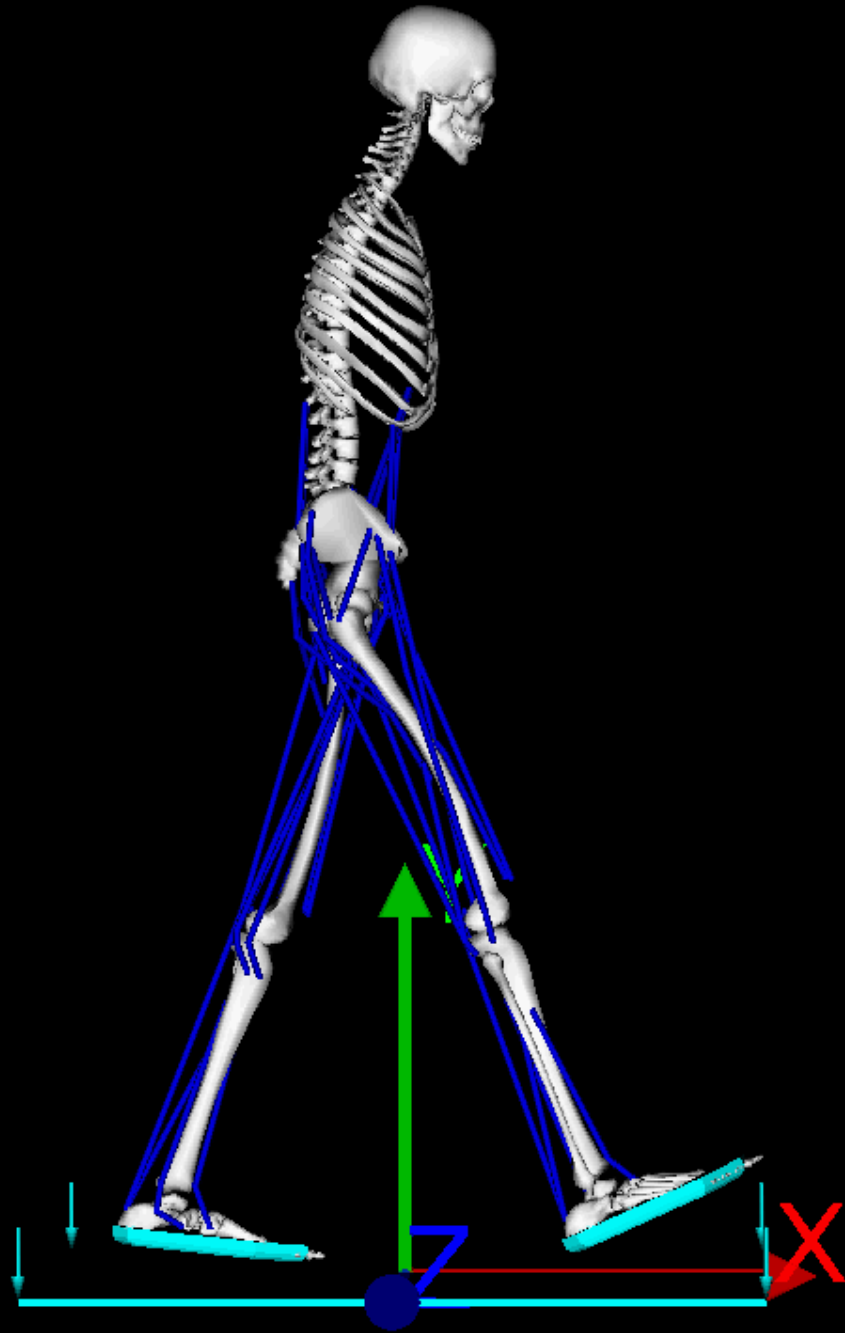


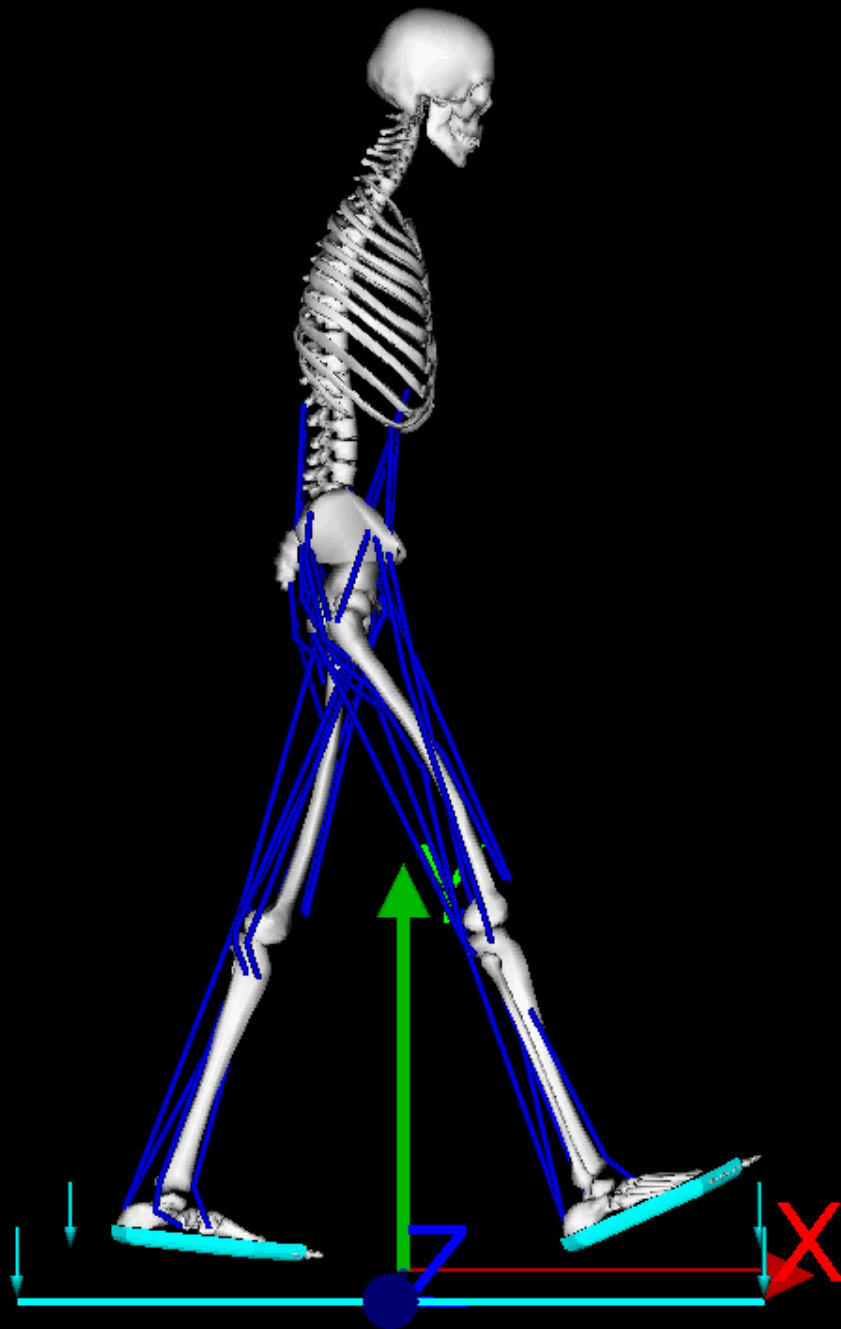
Generate Samples

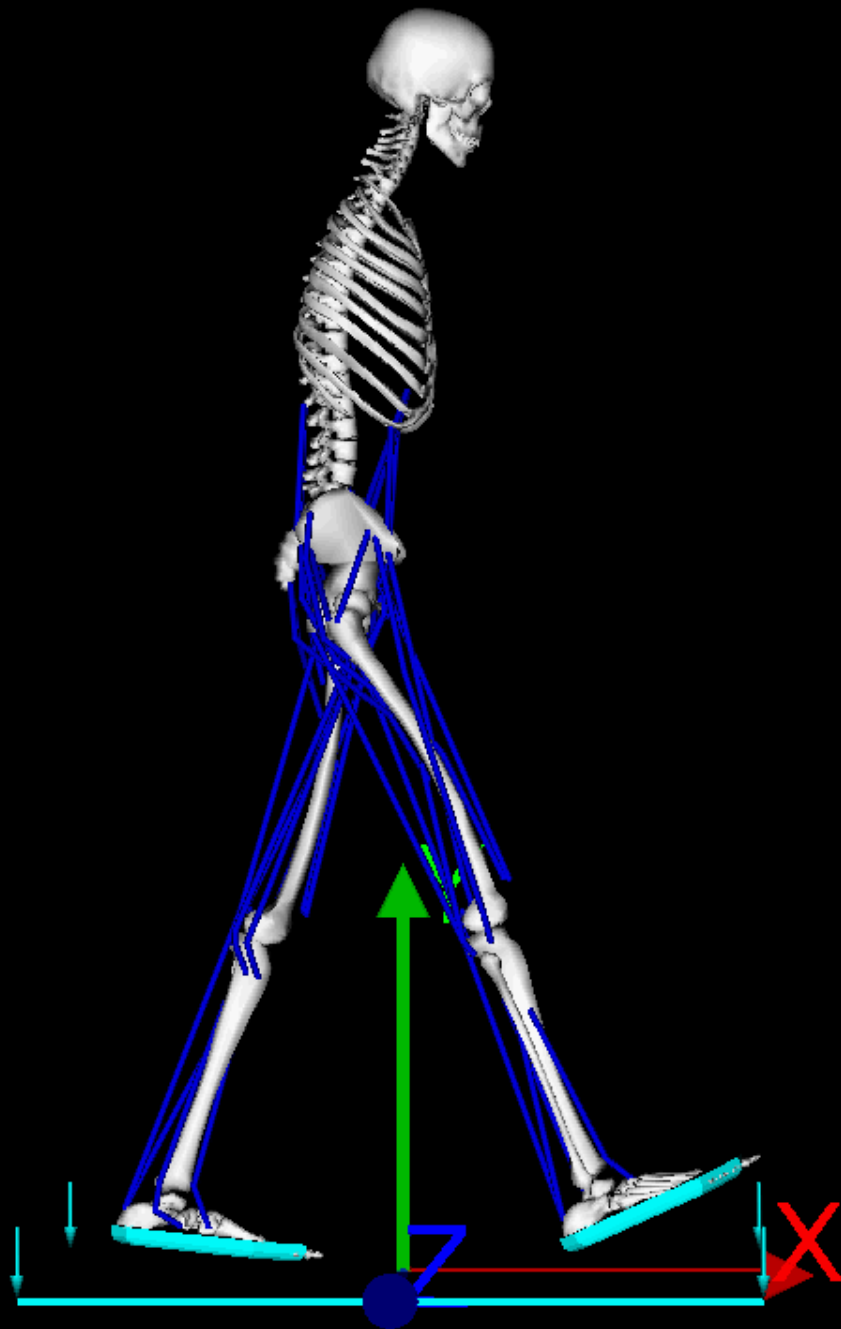
- Generate [state, modulation parameter] samples





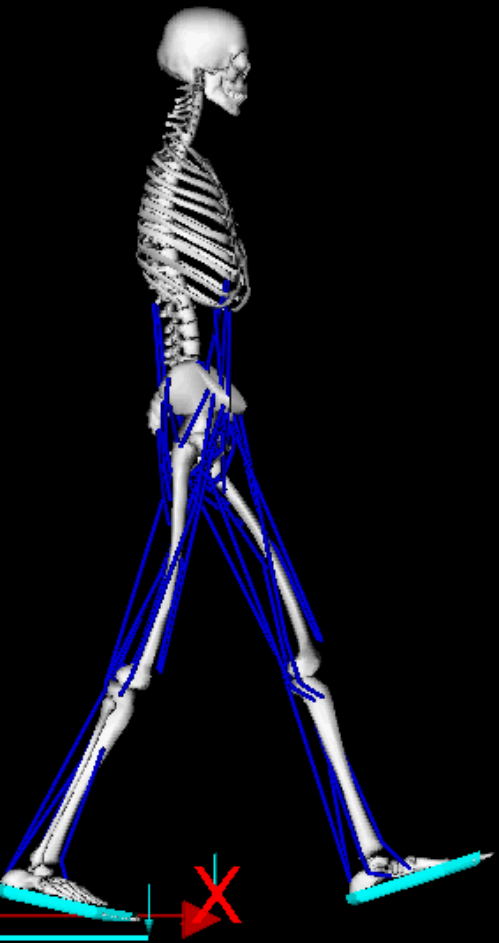






Approach 2

- Starts from Data-Driven Biped Control [2010]
- Data-driven controller for OpenSim Model



Approach 2

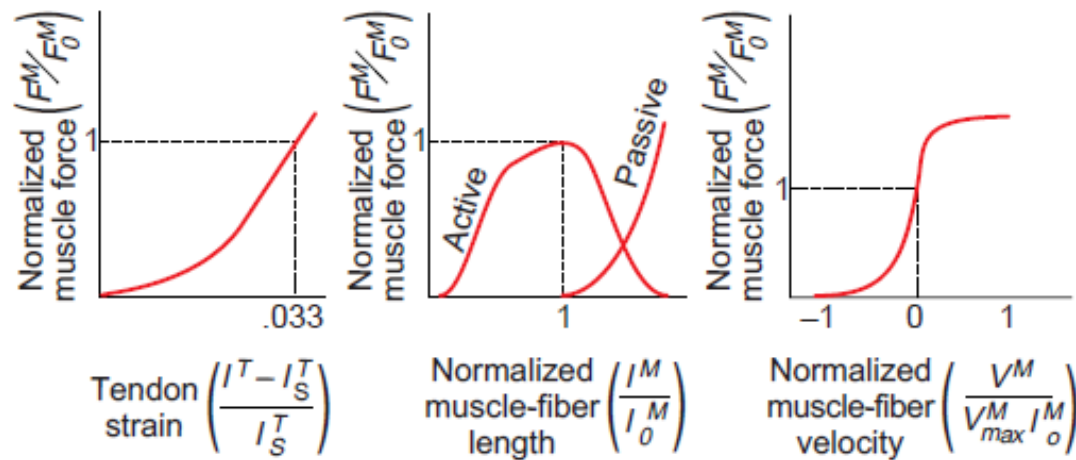
- At each time instance, we can get joint torques
- Muscle force
 - Quadratic Programming

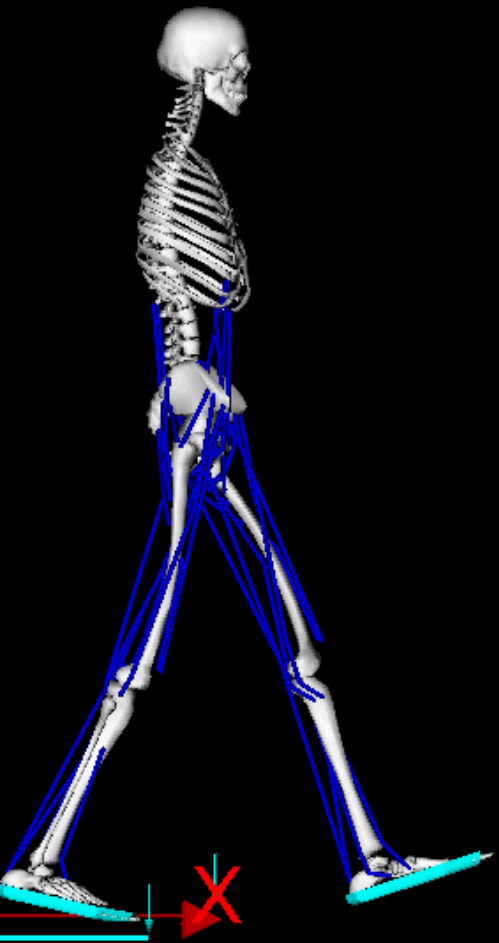
$$\min \|\mathbf{f}\|^2, \quad \tau = \mathbf{M}\mathbf{f}, \quad \mathbf{f}_{min} \leq \mathbf{f} \leq \mathbf{f}_{max}$$

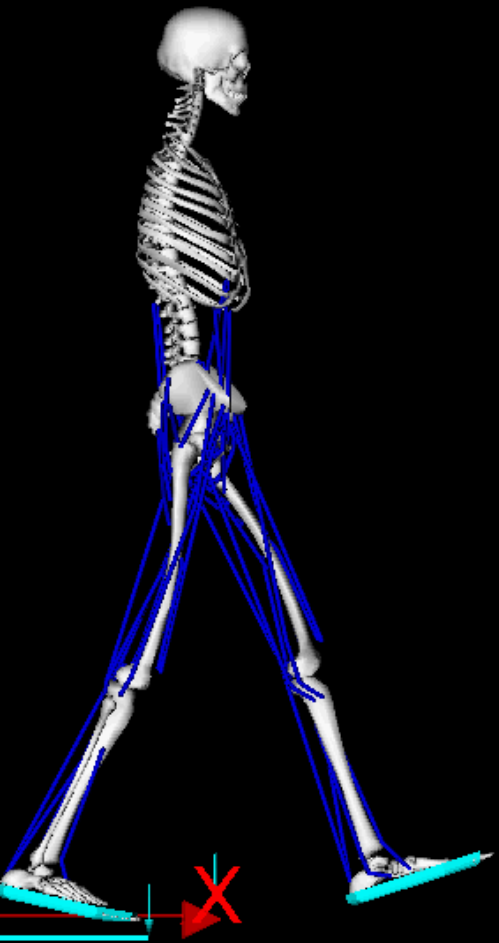


Approach 2

- Very very simple excitation computation
 - Excitation = muscle force / muscle maximum isometric force

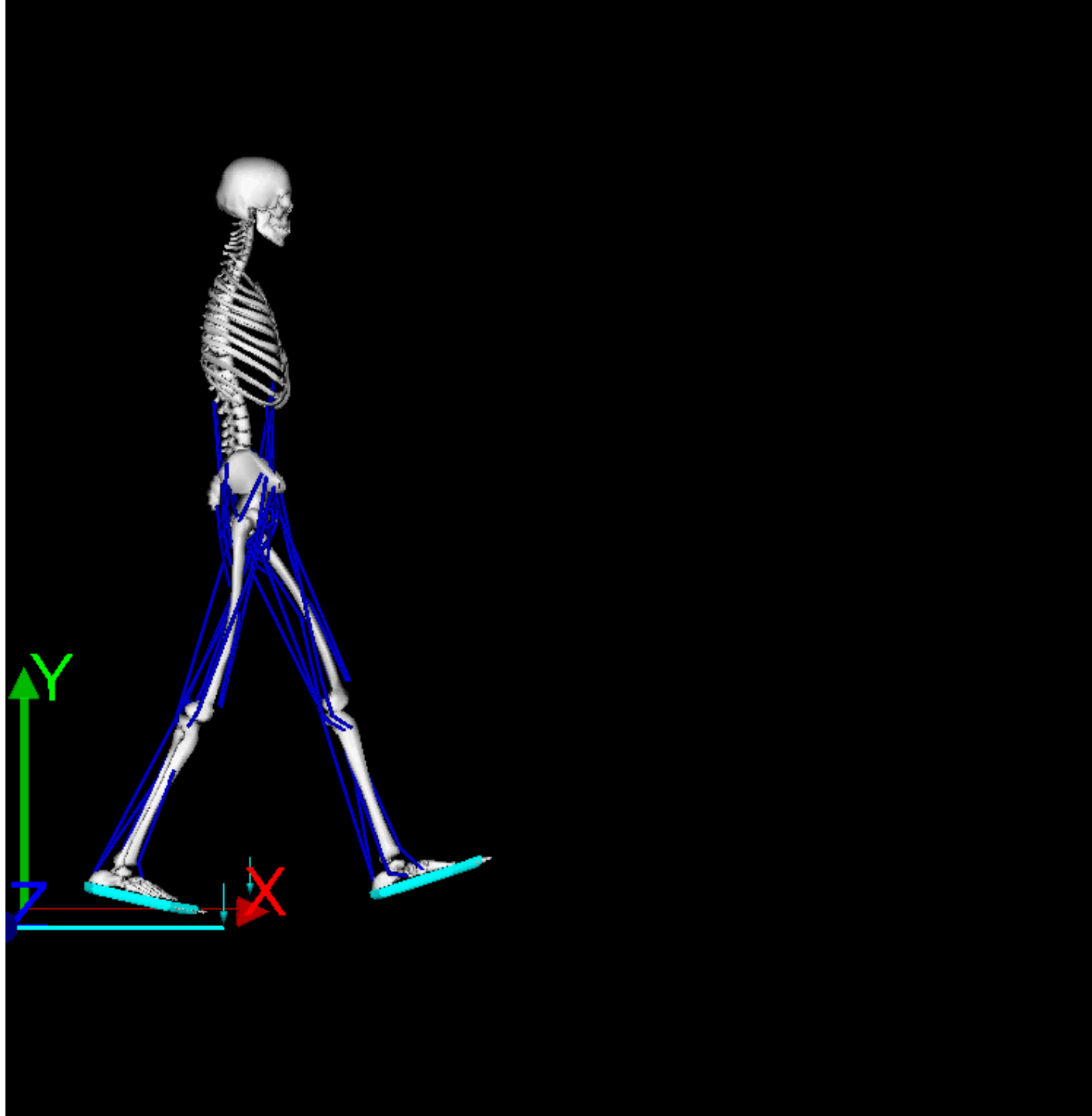






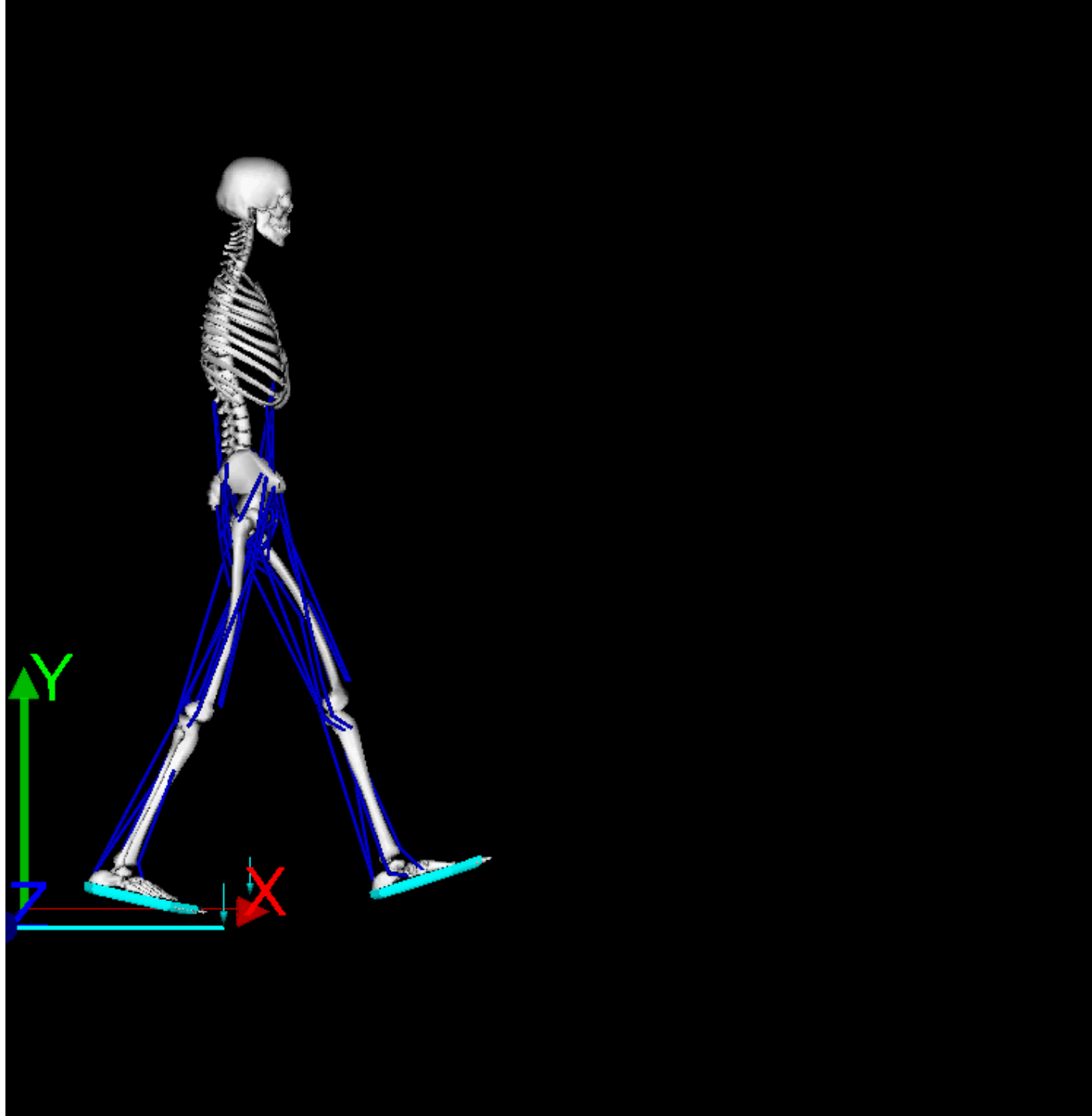
$$w1 = 100 * I$$

$$w2 = 1 * I$$



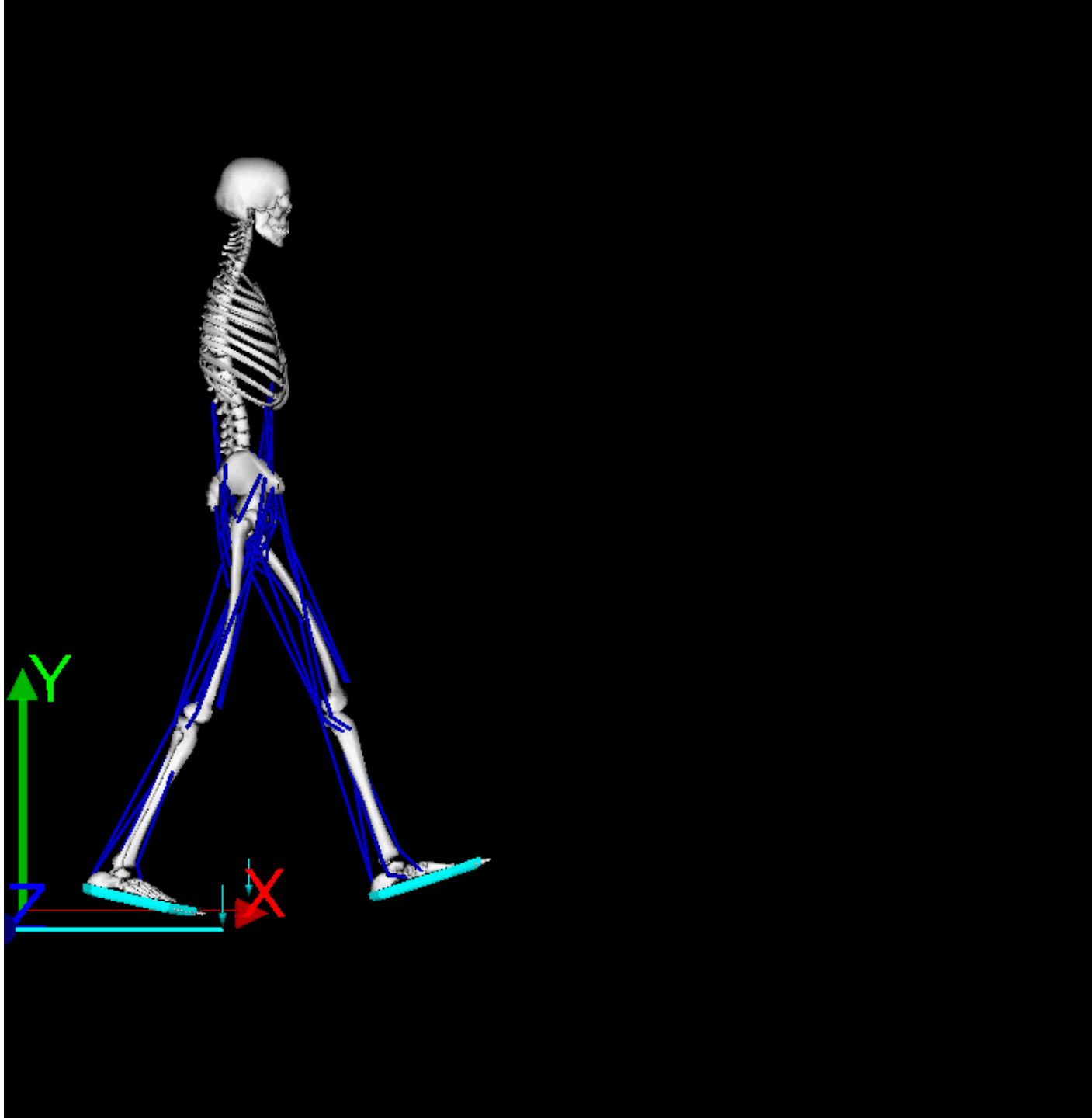
$$w1 = 500 * I$$

$$w2 = 1 * I$$



$$w1 = 1000 * I$$

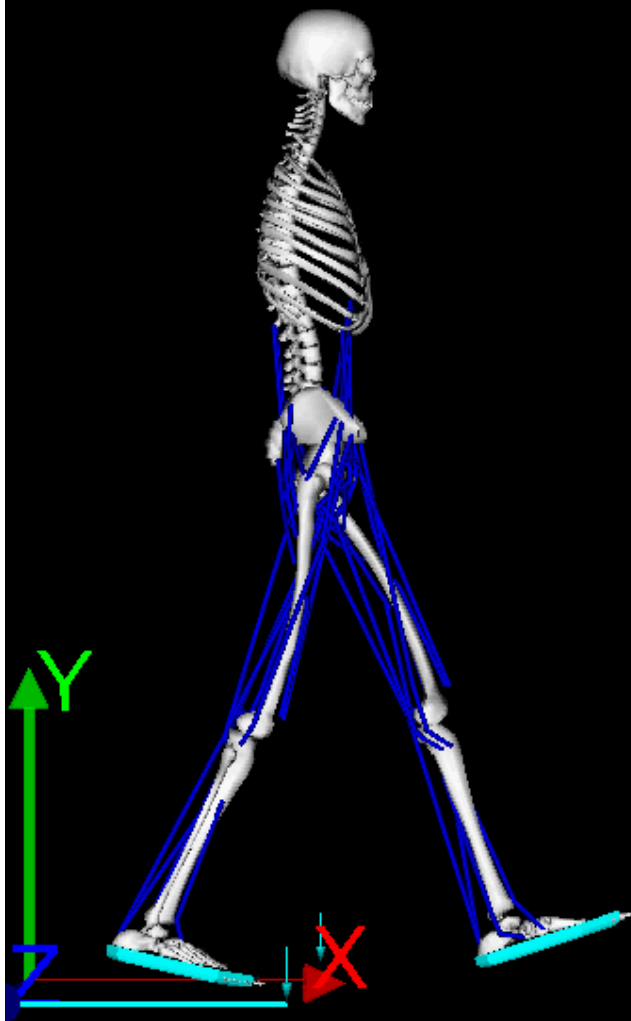
$$w2 = 1 * I$$



$w1=1000*I$

$w2=1*I$

More faster initial vel



Thank you