

Actuated Passive Dynamic Walker Control: Stable Walking with Varying Hip Mass and Ramp Angle

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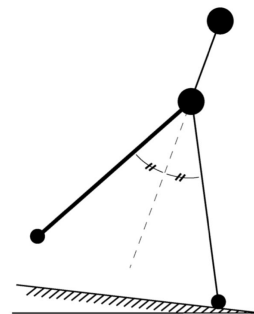
A dark blue diagonal gradient bar that starts from the bottom left and extends towards the top right, covering the lower half of the slide.

Compass Gait

- 1) Efficiency Analysis
 - a) Toe-off vs. Hip Actuator

- 2) Adding Upper Body Mass
 - a) Cart-pole system with compass gait

- 3) Various Speed
 - a) Leg angle planning



Compass Gait Stable Walking Conditions

1) Minimal Collision

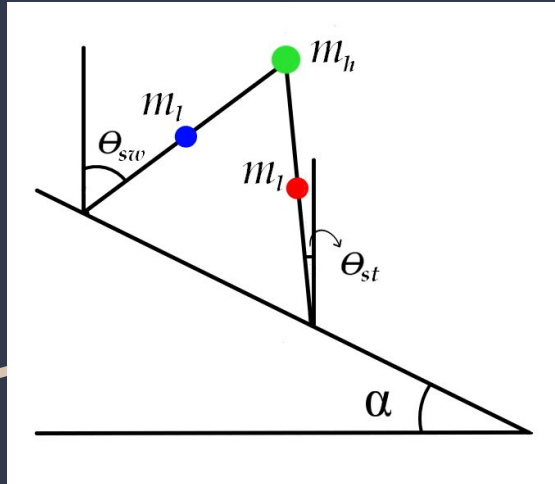


2) Sufficient Momentum

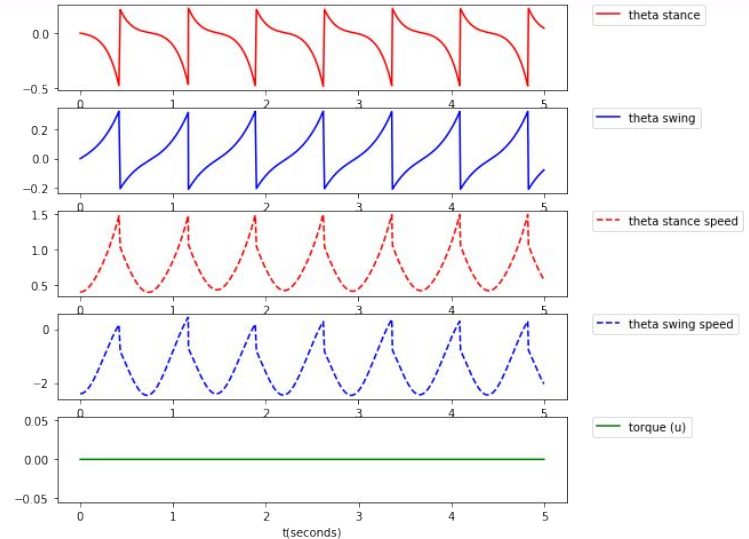
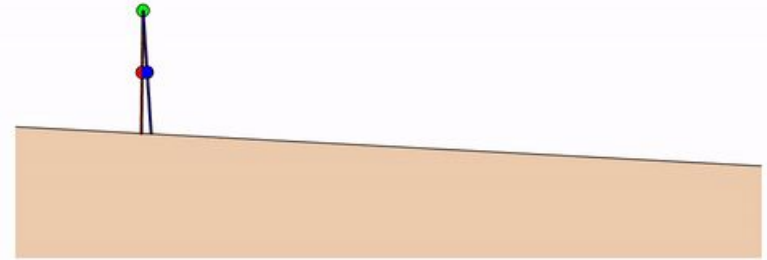


3) Torque Limit

Compass Gait Stable Walking Simulation



- Stance Leg
- Swing Leg
- Hip



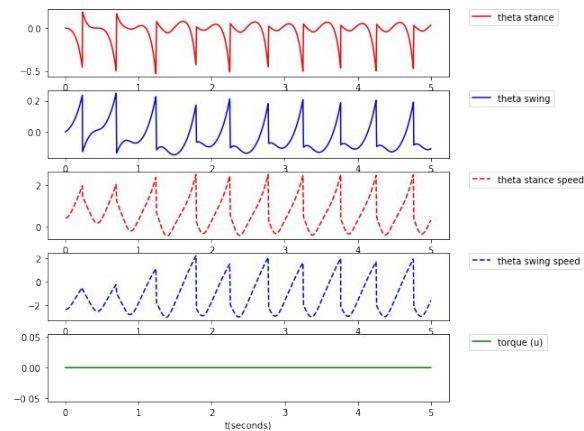
Compass Gait Controller

Hip Mass Perturbation

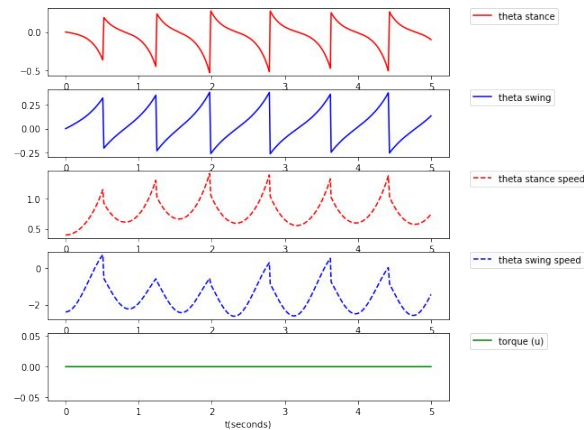


$m_h = 0.1 \text{ kg}$

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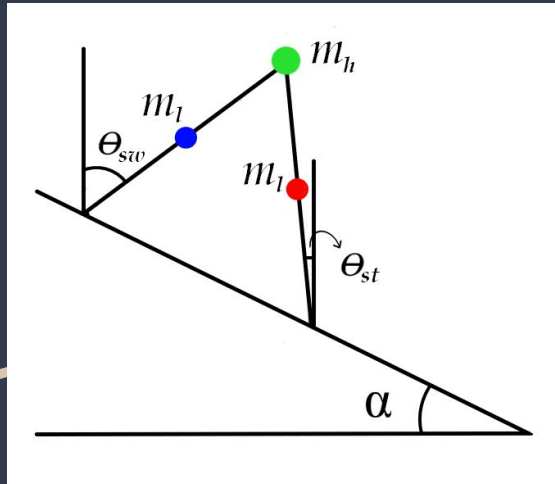


$m_h = 100 \text{ kg}$

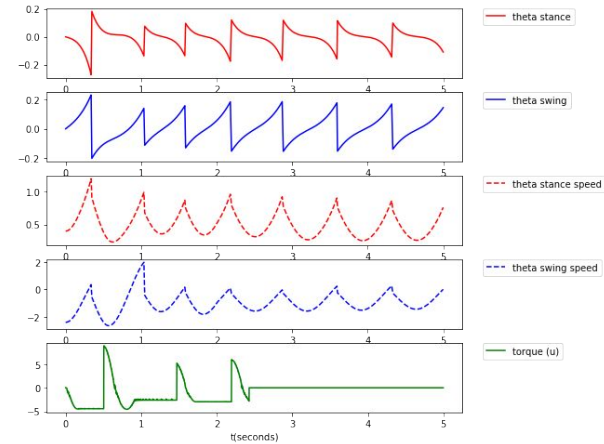


Compass Gait Controller

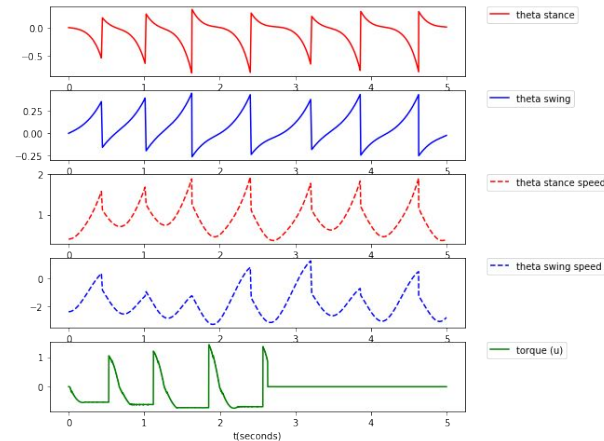
Ramp Angle Perturbation



$\alpha = 0.01$, gain ratio = 20:10



$\alpha = 0.09$, gain ratio = 2:1



Future Work...