Relationship of Joint Torque Control to the Force of the ground on the person's feet

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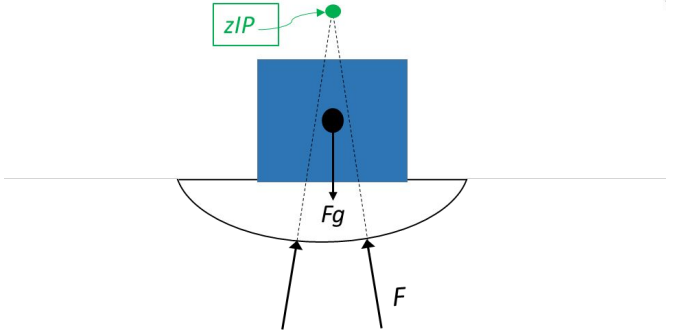
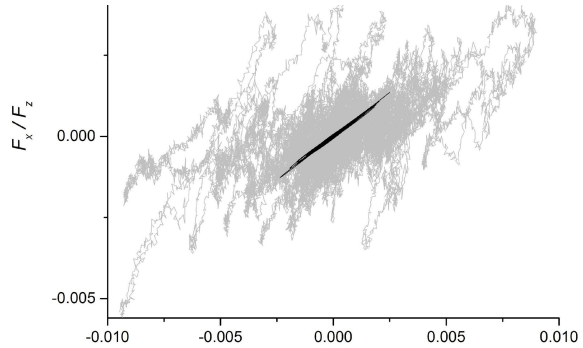
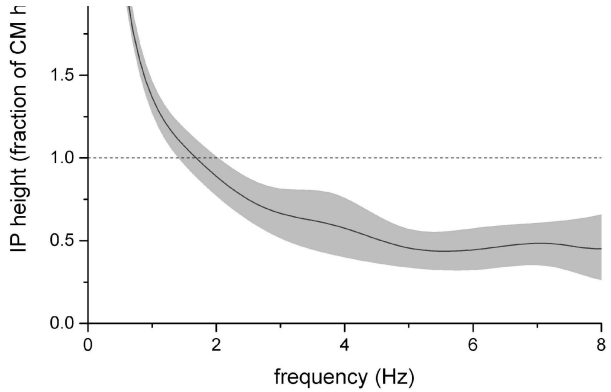
Background of My Research

- Existence of IP behavior in passive rocking objects
- Relationship between xCP, Fx, and Fz
- Potential of human to adopt any kind of joint torque and force control
- Existence in humans and is analyzed as a frequency dependent behavior
- Connection of IP behavior to inform us about joint torque control

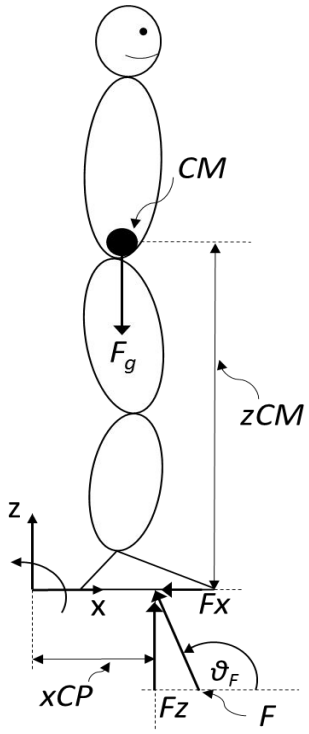


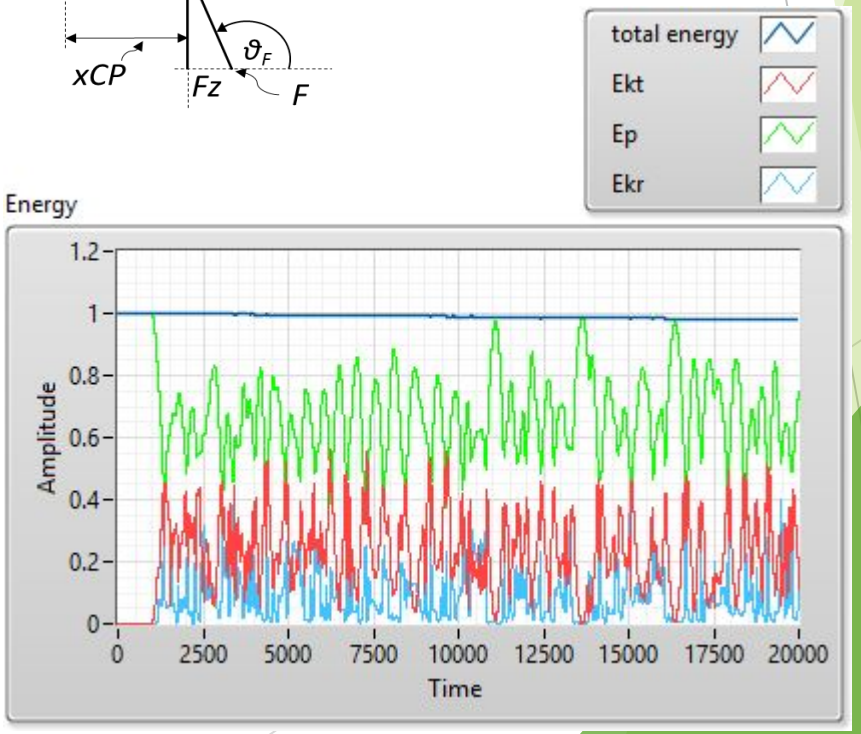




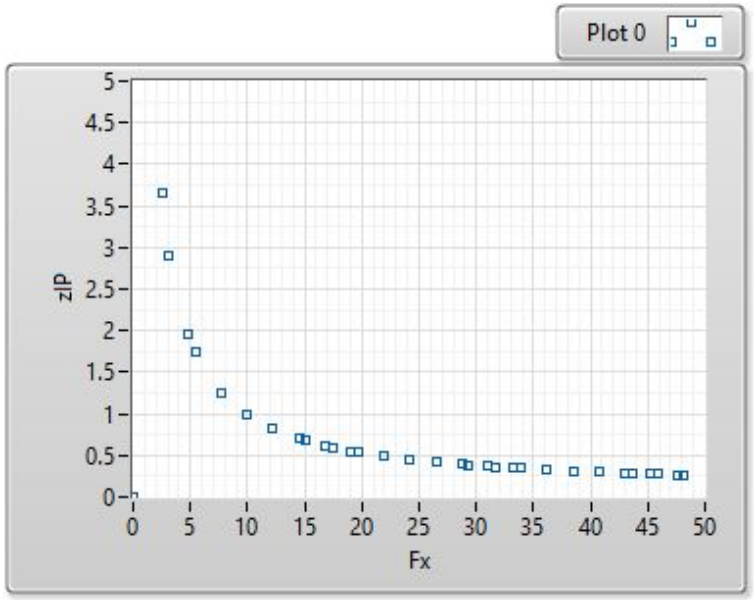
Mechanical model

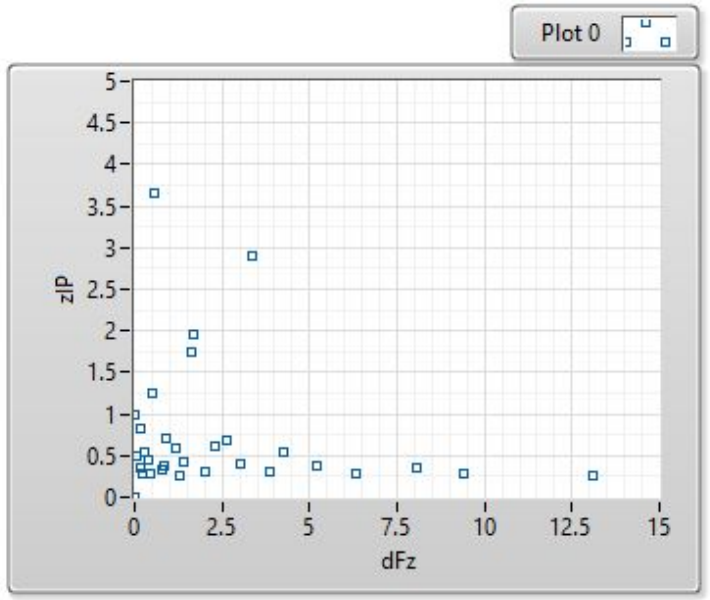
- Three rigid anthropometric segments
- Forward dynamics model using the Newton-Euler method
- Input of sagittal ankle, knee, and hip torque
- Period of linear joint torque
- State estimation using Runge Kutta

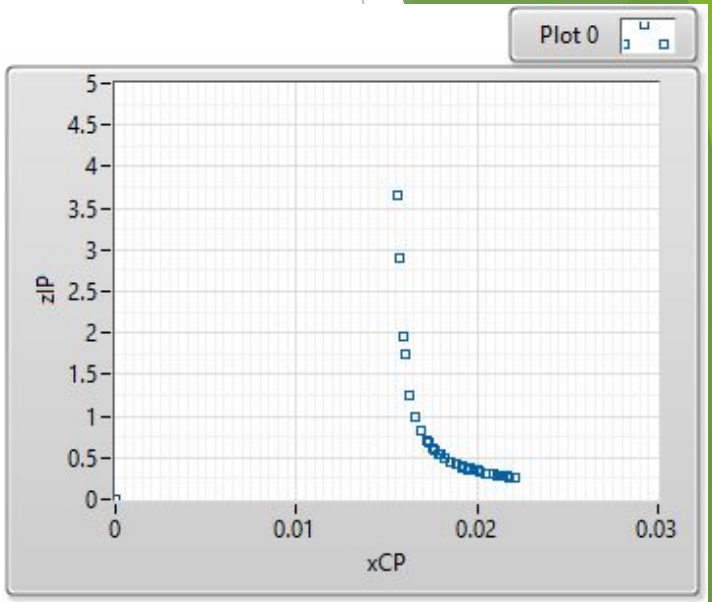


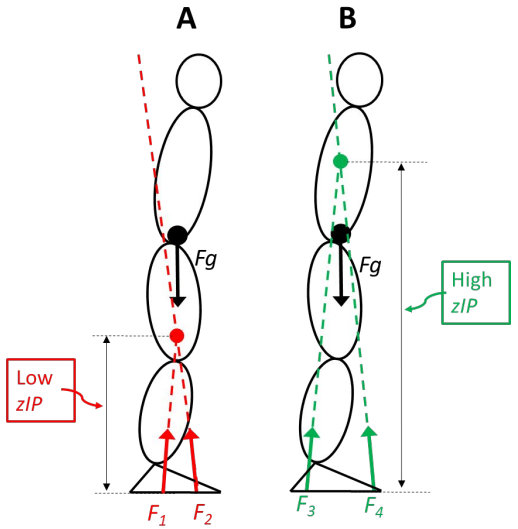


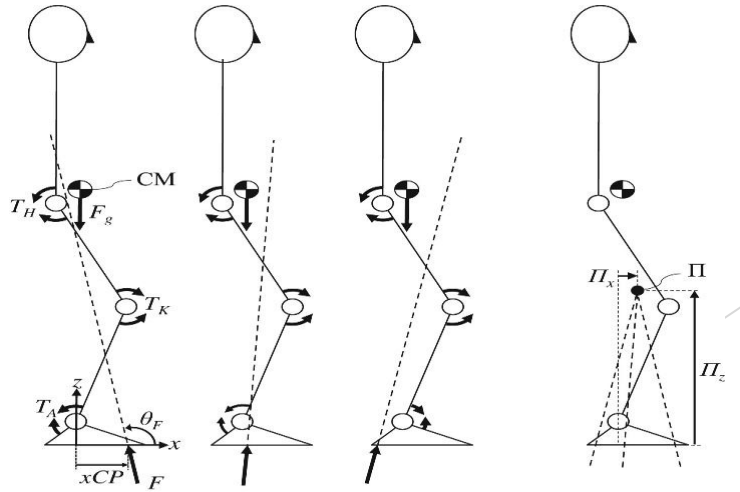
Exploration of Joint Torque Space











Future Goals

- Implement the Jacobian method
- Investigate the forward and backward nature of the intersection point
- Include sensory feedback to keep the model upright
- Use motion capture and inverse dynamics to observe joint torque control and see how the model responses to the control

Questions?