



Unsteady Bipedal Walking

How do people control their gait under unsteady conditions, like walking over uneven terrain or varying distances? Do young and older adults respond differently to unsteady conditions? Can wearable technology track and enhance older adult gait? In this talk, I will explore these questions through experiments using wearable sensors and an optimal control framework based on Newtonian mechanics. I will compare human strategies to predictions from optimal control models to better understand the foundations of gait control. Extending these studies, I will discuss how sensory feedback can change gait and balance and introduce a new method for assessing gait speed in older adults which is one of the most important metrics to monitor aging. I will then present a wearable system that applies low-level electrical stimulation to the balance organs and shows promising effects on standing and walking stability of older adults.

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Osman Darici is a postdoctoral associate in the Human Performance Laboratory at the University of Calgary and a researcher at Neursantys Inc. He conducts experimental and computational research on human biomechanics and neuroscience. He focuses on understanding how humans control their walking and balance in novel environments (i.e., uneven terrain walking) and the effects of sensory feedback (i.e., muscle vibration, vestibular stimulation) on young and older adult gait and balance.