

Neural Prosthesis Seminar

“Designing Spring Based Robots for Enhancing Mobility”

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Biomedical Research Building 105
Case Western Reserve University



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Abstract:

The Human Machine Integration Laboratory at Arizona State University has developed a powered prosthetic ankle using a spring-based Robotic Tendon and a unique control structure. The Robotic Tendon stores energy from both the human and a motor in a spring during the stance phase. The energy is released by the spring in a powerful burst to propel the person forward. A unique controller measures the angular rate and position of the shank to determine the ankle movement. It is a continuous looping controller that does not change states. It is also based on elevation angles, not joint angles. The combination of a simple controller and spring based actuator has allowed SPARKY (Spring Ankle with Regenerative Kinetics) to demonstrate walking, walking on slopes, ascending and descending stairs, jumping, and running. Future goals for this research would be to add volitional control using ideas such as peripheral nerve interfaces.

For more information, please contact Cheryl Dudek at (216) 231-3257.

Live stream video link for each lecture at www.FEScenter.org/Seminar