

This study proposes a novel biomimetic active prosthesis for above-knee amputees. The clinical impact of this technology focuses on improving an amputee's gait symmetry, walking speed, and metabolic energy consumption on variant terrain conditions. The electromechanical design of this robotic device mimics the body's own musculoskeletal design, using actuator technologies that have muscle-like behaviors and can integrate control methodologies that exploit the principles of human locomotion. This work seeks to advance the field of biomechatronics by contributing to the development of intelligent assistive technologies that adapt to the needs of the physically challenged.

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**Status** : Going on

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