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PASSIVELY VARIABLE TRANSMISSION FOR PROSTHETICS AND EXOSKELETONS

MEDICAL DEVICES

Passively variable transmission system that enables powered walking.

TECHNOLOGY TYPE

Class I/II
Prosthetics
Exoskeletons

STAGE OF DEVELOPMENT

- Preliminary simulations and CAD models.
- Refining CAD model and fabricating first prototype.

IP PROTECTION

Provisional patent filed.

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TECHNOLOGY SUMMARY

There are about 185,000 lower limb amputations in the United States each year. Moving lower limb prosthetics often requires greater metabolic costs and often slows amputees' walking gaits. Current active prosthetics, which react autonomously to changing surroundings, gait cues, and more, are unable to optimize themselves to large changes in pace: For example, a motorized device optimized for stair climbing has a high transmission ratio that is unable to move fast enough to provide assistance walking.

University of Utah researchers at the Bionic Engineering Lab have developed a passively variable transmission system, enabling passive transmission ratio fluctuation. The passively variable elements of the transmission change length and/or orientation with variations in direction and magnitude of torque and force from elements of the prosthesis.

FEATURES AND BENEFITS

- Provides high-torque and high-power phases during extension, enabling use of smaller motors and reducing overall prosthesis size.
- Reduces weight compared to state-of-the-art prosthetics.
- Simplifies design of variable transmission prosthetics.

INVENTOR PROFILE

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