## **Project Title:**

Human Locomotion Augmentation via Wearable Robotic Devices with Elastic Actuation

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## **Project Abstract/Proposal Summary:**

Legged locomotion, the primary mode of movement for terrestrial animals and humans, exhibits remarkable adaptability to various landscapes. Inspired by the exceptional mobility of animals and the potential of robotic augmentation, this project aims to develop wearable robotic devices that significantly enhance human running and locomotion performance beyond natural physiological limits.

Our approach involves the development of two human-centric devices. Initially, we will create a mo- torized pogo stick, leveraging our expertise in robotic jumping mechanisms, to enable continuous jumping with minimal physical exertion required from the user. This device will serve as a foundation for the de- velopment of the second device, as we will adapt the actuation mechanism to create actuated wearable stilt. These stilts will incorporate an actuated springloaded mechanism to achieve superior legged locomotion, efficiently storing and releasing energy during the running or hopping motion. This will empower users to achieve greater jump height, increased stride lengths, and faster running speeds.

The outcomes of this project include the successful development of both devices. Potential applications of these innovations span personal transportation, recreational activities, sports, and rescue operations in unstructured environments. Additionally, we aim to secure 2-3 patents and facilitate commercialization through licensing agreements with a recently established startup, ultimately contributing to the advancement of wearable robotics for human augmentation.