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Harvesting and storing energy is a key problem in some applications. Elastic energy storage technology has the advantages of wide-sources, simple structural principle, renewability, high ...

Storage of elastic energy is key to increasing the efficiency, speed, and power output of many biological systems. This paper describes a simple design strategy for the rapid fabrication of prestressed soft actuators (PSAs), exploiting elastic energy storage to enhance the capabilities of soft robots. The elastic energy that PSAs store in their ...

Elastic materials that store and release elastic energy play pivotal roles in both macro and micro mechanical systems. Uniting high elastic energy density and efficiency is crucial for emerging technologies such as artificial muscles, hopping robots, and unmanned aerial vehicle catapults, yet it remains a significant challenge.

This enables efficient utilization of dead points for elastic energy storage and release, enhancing operational simplicity and reliability. Building upon this strategy, we designed a jumping leg mechanism in which the fully contracted position before take-off was aligned with a dead point. The storage and release of elastic energy are ...

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This relaxor ferroelectric elastomer maintains a stable energy density ($>8 \text{ J cm}^{-3}$) and energy storage efficiency ($>75\%$) under strains ranging from 0 to 80%. This strain ...

Energy storage in elastic deformations in the mechanical domain offers an alternative to the electrical, electrochemical, chemical, and thermal energy storage approaches studied in the recent years. The present paper aims at giving an overview of mechanical spring systems" potential for energy storage applications. Part of the appeal of ...

Introduction. The role of the Achilles tendon (AT) in elastic energy storage with subsequent return during stance phase is well established 1 - 7.Recovery of elastic energy ...

Elastic energy and biological springs When a material is subjected to a force, F , it deforms. During this deformation, the force moves over a finite displacement, x , and thus does work, Fx . This ...

substantial elastic energy storage and return during hopping. However, recent species-specific material properties research suggests that, despite relative thickness, the ankle extensor tendons of these small hoppers are considerably more compliant than had been assumed. With faster locomotor speeds demanding higher forces, a lower tendon ...

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