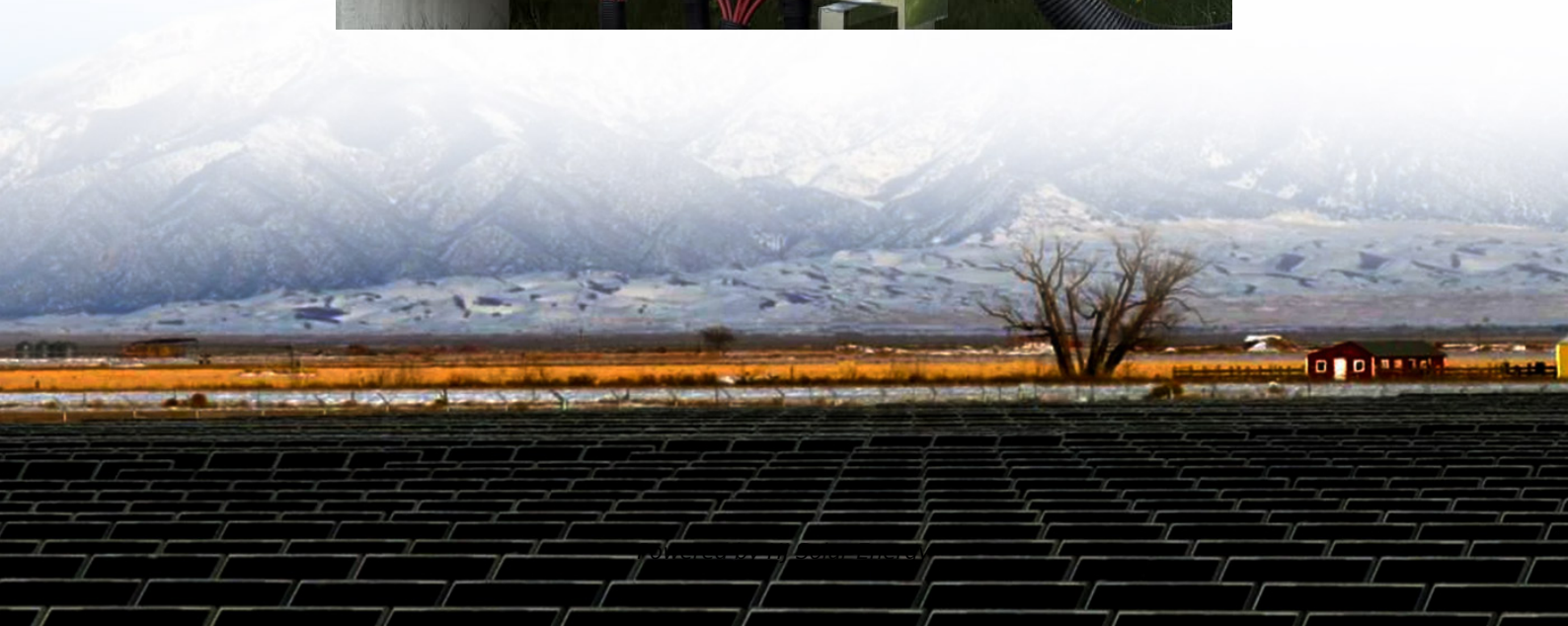


# Elastic energy storage joint





## Overview

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Despite the advantages and widespread use of bolted joints in manufacturing, one major problem is their tendency to loosen, which can ultimately cause the joint to fail. This research evaluates strain energy stora.



## Elastic energy storage joint



### Structure and Function of Ligaments, Tendons, and Joint ...

BACKGROUND Elastic energy storage in tendons in the legs and feet of many animals is an important mechanism that saves substantial quantities of muscular energy during locomotion ...

### Optimally Controlling the Timing of Energy Transfer in Elastic ...

Furthermore, we demonstrate that providing full control authority over the energy transfer timing and link decoupling allows the user to synchronously release both elastic joint and gravitational ...



### Elastic energy storage mechanism and driving joint ...

A technology of an exoskeleton robot and an energy storage mechanism, applied in the field of medical devices, can solve the problems of power consumption, ...

### Structure and Function of Ligaments, Tendons, and Joint Capsule

For vertebrates to achieve locomotion and to hurl objects efficiently, they must be able to develop muscular forces, store elastic energy in tendon,



and then transfer this energy to the attached ...



### Shorter heels are linked with greater elastic energy storage in the

The spring function of the Achilles tendon was evaluated using specific net work, a metric of mechanical energy production versus absorption at a limb joint. We also combined ...

### Research on the biomimetic quadruped jumping robot based on ...

Here, a design concept and a control algorithm are presented that aim at enhancing the explosive force of quadruped robots during jumping by utilizing elastic energy storage components. The ...



### Kinematic synthesis and mechanism design of a six-bar jumping ...

The energy stored inside the elastic components is constant, and most of the existing jumping robots cannot control the take-off velocity [22]. Thirdly, the time gap of the ...



### The mechanics of the gibbon foot and its potential for elastic energy

To estimate the potential elastic storage of energy in the triceps and digital flexors, we calculated instantaneous joint powers and positive and negative external work at ...

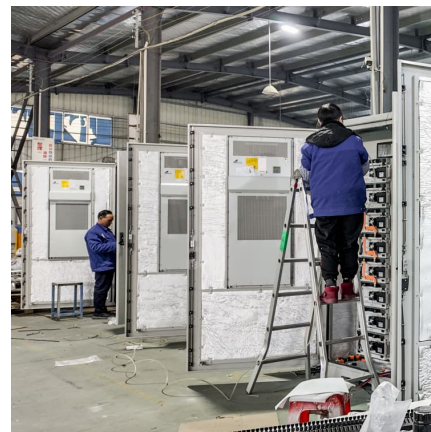


### Increased force and elastic energy storage are not the

Joint moments, 198 joint power, and vertical COM power data were filtered with a 5Hz low-pass second-order 199 Butterworth filter. We then integrated joint power and vertical ...

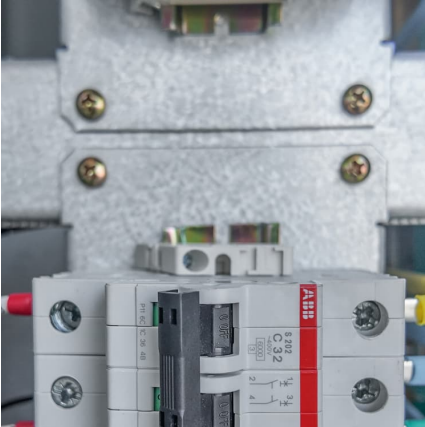
### The mechanics of elastic loading and recoil in anuran ...

This poses a challenge to elastic energy storage systems, which require some method to resist the joint torque and allow stretching of the ...



### The effects of temperature on elastic energy storage and release ...

The elastic recoil mechanism in frog jumps is mediated by a dynamic mechanical advantage latch (a type of geometric latch), where the poor mechanical advantage ...



### Evidence for a vertebrate catapult: elastic energy storage in ...

These supramaximal power outputs are hypothesized to be the result of a catapult-like mechanism, which stores and subsequently releases elastic strain energy [2-5]. A catapult ...



### Design of the Jump Mechanism for a Biomimetic Robotic Frog

Moreover, the compact elastic energy storage and trigger mechanism is used to realize the complete jumping process of the robot, that is, elastic energy storage and regulation, energy ...

### Optimally Controlling the Timing of Energy Transfer in Elastic ...

Optimally Controlling the Timing of Energy Transfer in Elastic Joints: Experimental Validation of the Bi-Stiffness Actuation Concept Published in: IEEE Robotics and Automation Letters ( ...





### **Stiffness Optimal Modulation of a Variable Stiffness Energy ...**

Abstract-- Lower limb energy storage assisted exoskeletons realize walking assistance by using the energy stored by elastic elements during walking. Such exoskeletons are characterized by ...

### **Unlocking the secrets of kangaroo locomotor energetics: Postural**

Based on their suggestion that kangaroo posture changes with speed increase tendon stress/strain and hence elastic energy storage/return, the authors imply (but do not ...



### **Evidence for a vertebrate catapult: elastic energy storage in the**

Anuran jumping is one of the most powerful accelerations in vertebrate locomotion. Several species are hypothesized to use a catapult-like mechanism to store and ...

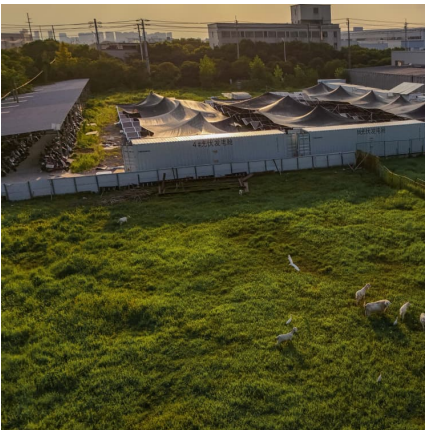
### **Investigation of energy storage in bolted joint components and the**

This work opens further research avenues for analyzing anti-loosening joints from the perspective of the elastic energy stored in the joint and thereby predicting when the joint ...



### [Movement Strategies for Countermovement Jumping ...](#)

Abstract The preferred movement strategies that humans choose to produce work for movement are not fully understood. Previous studies have demonstrated an ...



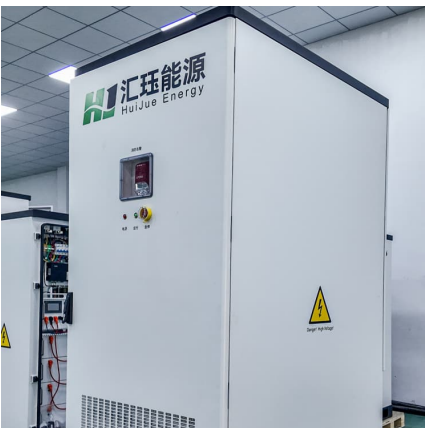
### **Evidence for a vertebrate catapult: elastic energy storage in the**

A study of semimembranosus function during jumping concluded that there was a tight correlation between muscle action and joint action [1]. In contrast, measurements of plantaris muscle ...



### **Tendons and Ligaments: Structure, Mechanical Behavior and ...**

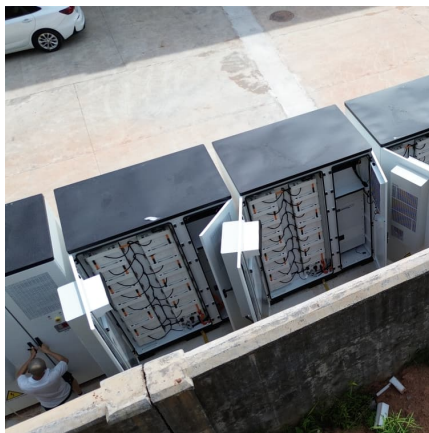
Tendon architecture greatly affects the storage and recovery of elastic strain energy, with long, thin tendons favoring greater strain energy/volume (and weight) of the tendon. It is likely that ...





### The mechanics of the gibbon foot and its potential for ...

To estimate the potential elastic storage of energy in the triceps and digital flexors, we calculated instantaneous joint powers and positive and ...

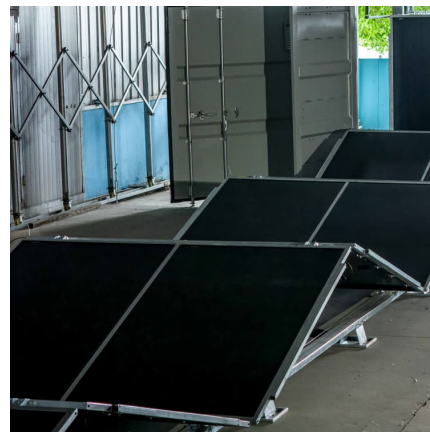


### CN112025762A

The embodiment of the invention provides an energy storage joint structure and an exoskeleton device, and relates to the technical field of exoskeleton. The energy storage joint structure ...

### Increased force and elastic energy storage are not the ...

Therefore the joint moment changes at the turning point of the jump with AEL suggests no change in elastic energy storage at the ankle (a key joint for storing and returning ...



### Contribution of elastic tissues to the mechanics and energetics of

Summary: Muscles are full of springs. Some roles for elastic elements are well established; others can be predicted based on the potential for energy storage within individual ...



### **CN112025762B**

The embodiment of the invention provides an energy storage joint structure and an exoskeleton device, and relates to the technical field of exoskeleton. The energy storage joint structure ...



### **Shorter heels are linked with greater elastic energy storage ...**

The role of the Achilles tendon (AT) in elastic energy storage with subsequent return during stance phase is well established<sup>1-7</sup>. Recovery of elastic energy imparted to the AT is ...

### Tendon elasticity and muscle function

Vertebrate animals exploit the elastic properties of their tendons in several different ways. Firstly, metabolic energy can be saved in locomotion if tendons stretch and then ...





### **The integrated function of muscles and tendons during locomotion**

Elastic energy storage and recovery in tendons may also provide a key mechanism to enable individual muscles to alter their mechanical function, from isometric force-producers during ...

### It pays to have a spring in your step

A large portion of the mechanical work required for walking comes from muscles and tendons crossing the ankle joint. By storing and releasing elastic energy in the Achilles tendon during ...

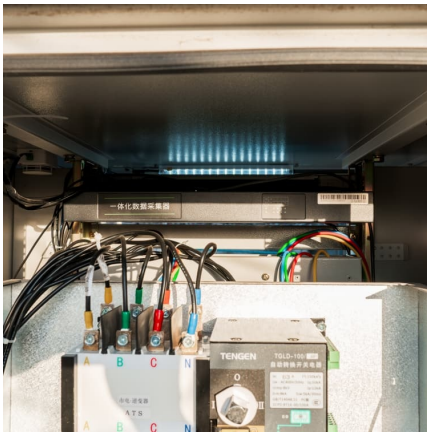


### **Investigation of energy storage in bolted joint components and the**

One of the tool's inputs is the bolt deflection relaxation within the acceptable bolt preload window. This work opens further research avenues for analyzing anti-loosening joints ...

### **Design of a Compact Energy Storage with Rotary Series Elastic ...**

In this paper, the design of a compact, lightweight energy storage device combined with a rotary series elastic actuator (ES-RSEA) is proposed for use in a lumbar ...



### **Muscle mechanics and energy expenditure of the triceps ...**

Given that these findings conflict with the suggestion that forefoot patterns 79 should result in a reduced whole-body metabolic cost, greater elastic energy storage and release 80 by the ...

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