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Half-Virtual-Half-Physical Microactuator

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Technology description

Actuators convert energy into motion in a wide range of systems. The use of actuators to mimic biological systems is desirable but currently available actuators are large, constrained in movement, and are subject to high failure. The potential miniaturization and mass production of actuators can help solve recurring problems in medical devices (such as artificial muscle) and commonplace mechanical systems.

Researchers at the University of California, Davis have developed a versatile half-virtual-half-physical microactuator for use in medical and mechanical systems. This actuator consists of an array of microactuators. Each microactuator is small (100μm -a few mm) and can independently contract or relax via embedded computing units in response to locally generated, real-time, virtual signals (such as those from a computational modeled signals). The actuators themselves are powered by an external power supply and are made of durable and flexible materials for use in severe environments. The actuators can be connected to work in parallel by an elastic body, allowing the system to be scaled for use in a wide array of applications.

Researchers at the University of California, Davis have developed a half-virtual-half-physical microactuator that utilizes a combination of computational models and microelectromechanical systems for use in medical devices and mechanical systems.

Application area

Versatile microactuator

Artificial cardiac or skeletal tissue

Mechanical and hydraulic systems

Advantages

Durable and flexible actuator, capable of withstanding harsh environments

Small (100μm -1mm) and scalable (~a few m)

Independent, fully functional units

Units can be linked for synced, parallel signaling with a high level of redundancy for use in large systems

Can support structural systems or serve as structural material

Applicable in a broad range of systems

Institution

University of California, Davis

Inventors

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