Permanet magnet actuator for adaptive actuation

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The invention

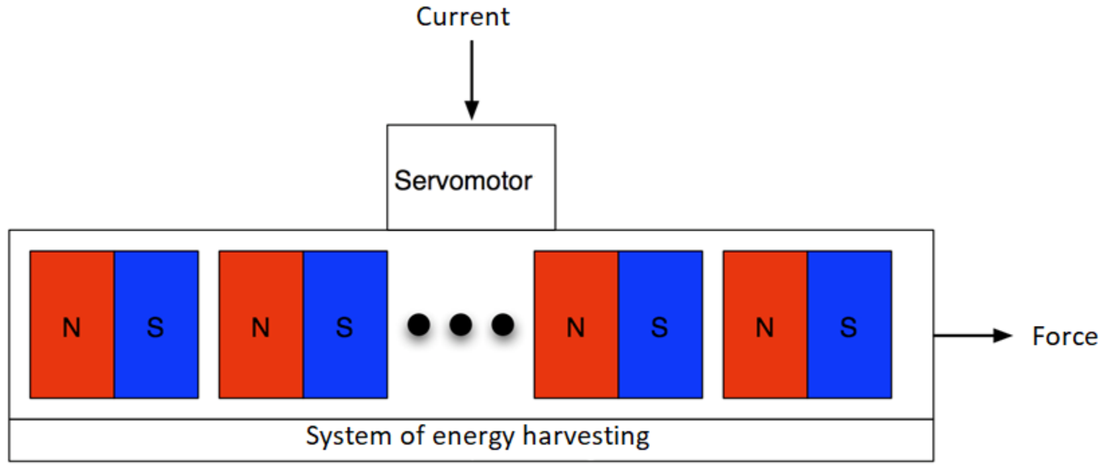
In bioinspired robotics, the performance of robotic actuators are not effective like achieved, for example, by muscles. The main limitations are inertia, irreversibility, low efficiency, and inability to control stiffness. These limitations prevent the development of suitable machines n applications where natural interaction with the environment and the user is required. Furthermore, these limitations force the embodiment to have only partially effective control.

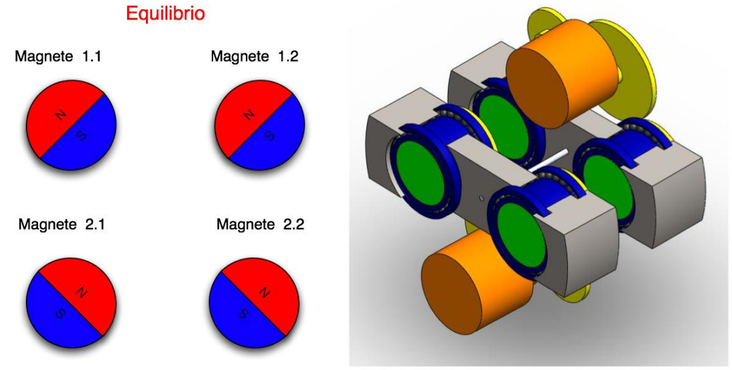
The invention proposes the creation of a new type of actuator that allows to achieve adaptability to the environment, ensuring a high mechanical efficiency and high transmission force.

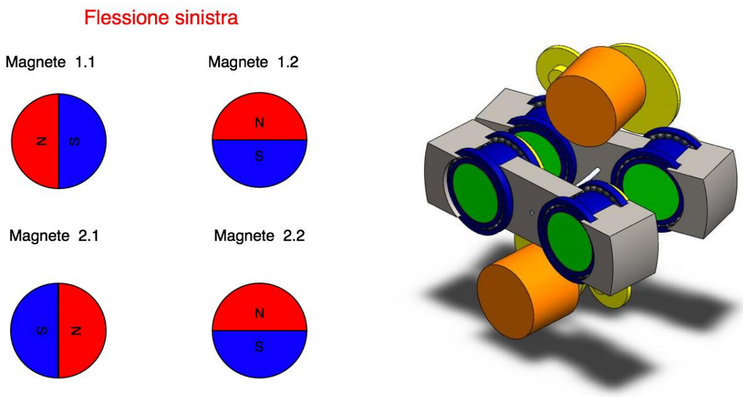
The resulting actuator has the following characteristics:

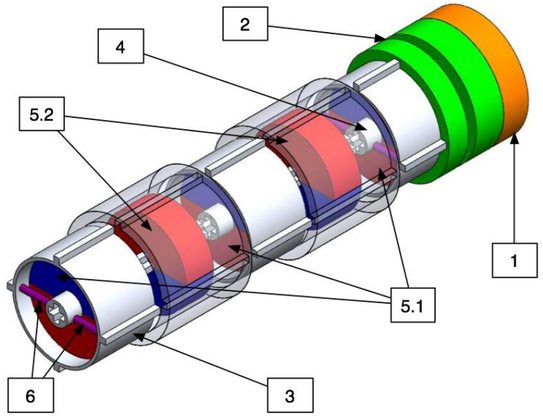
- Direct use of magnets allows high forces to be achieved with good adaptability.
- More effective control of magnetic interactions
- More control of transmission forces in intensity and direction.

Drawings & pictures









Industrial Application

The main characteristic of the magnetic actuator is the ability to interact with the environment or the user in an adaptive way. This ability can perform decoupled forces from the generated displacement. This characteristic is intrinsic to the system (no dedicated control techniques are needed) and is achieved with greater efficiency and simplicity than traditional commercial implementation systems.

Applications range goes from the bioinspired robotics ("muscle like" actuators) to industrial robotics (flexible assembly or handling systems).

Possible development

The research group is interested in industrial collaborations to increase the TRL of this invention or industrial partners interested in licensing the technology covered by this patent.

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