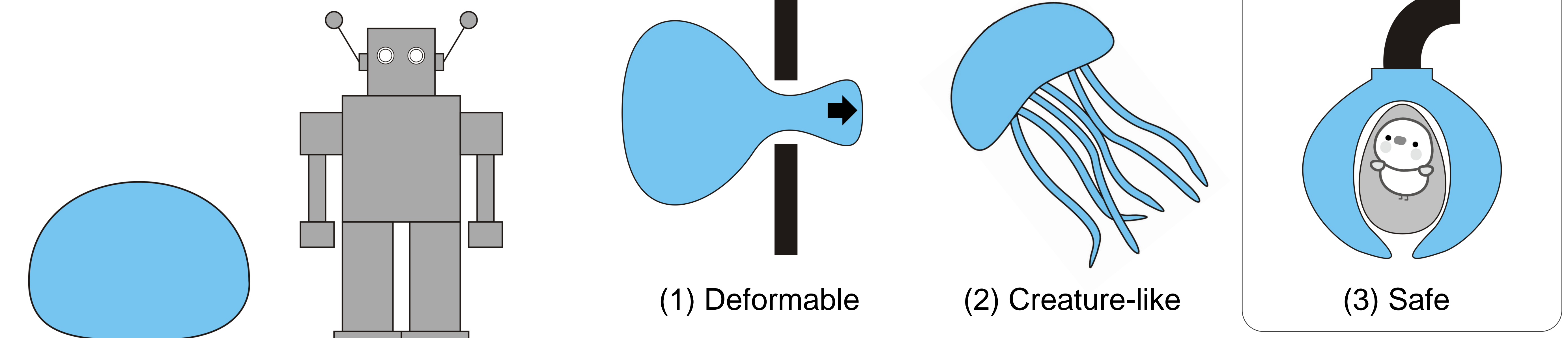


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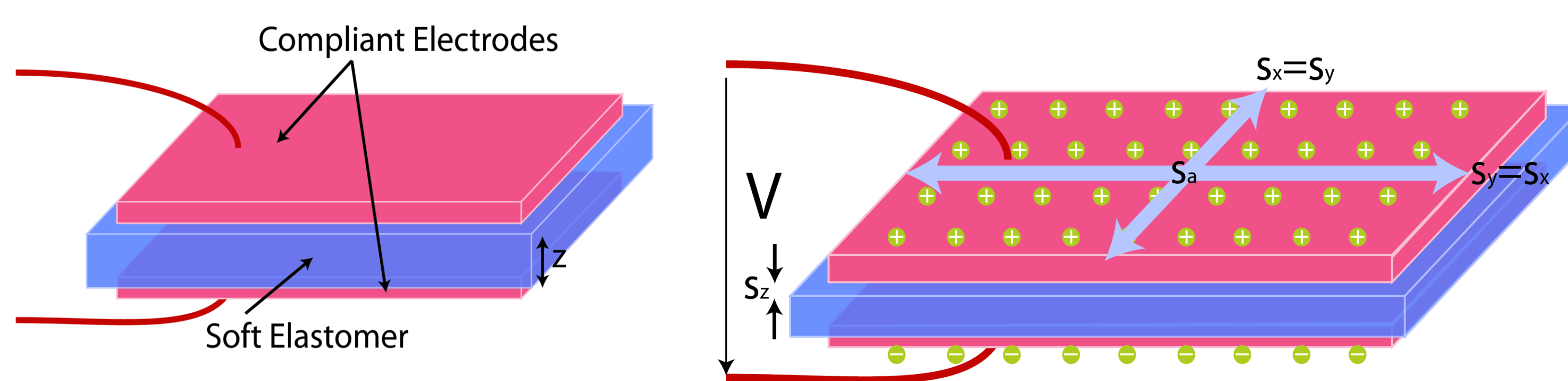
Soft robots?



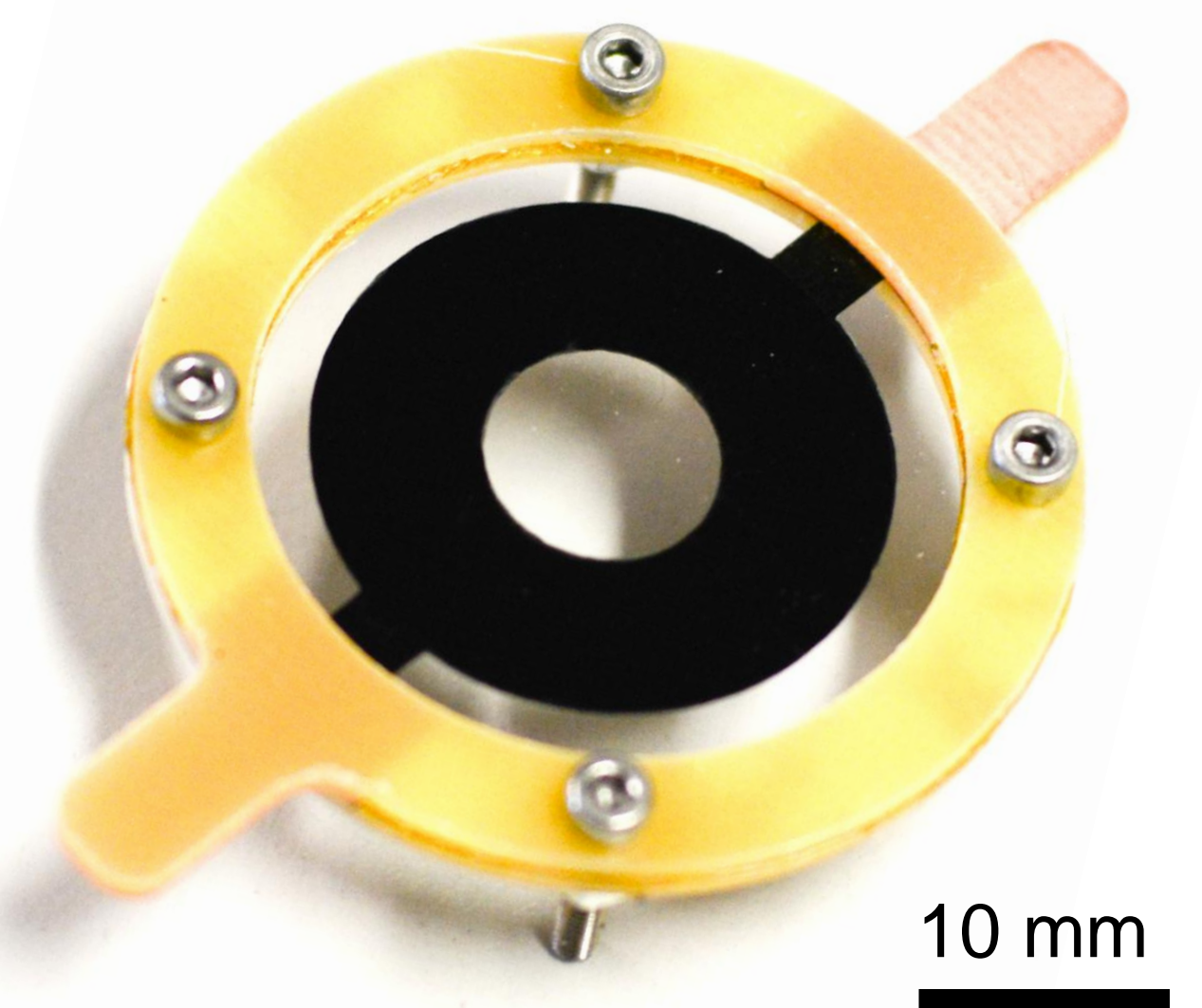
Soft robots consist of soft or flexible materials unlike traditional methods which use rigid parts. The softness allows the robots to be (1) highly deformable, (2) creature-like, and (3) safe to other objects.

Artificial muscle?

We are using Dielectric Elastomer Actuators (DEA) which are often called artificial muscles because their properties are similar to natural muscles.



A DEA device



DEA consists of a soft elastomer sandwiched by compliant electrodes. When a voltage is applied to the electrodes, an electrostatic force is generated, compressing the elastomer, which leads to decrease of thickness and expansion of area.

Material:

- Silicone elastomer (transparent)
- Carbon particle mixed silicone electrodes (black)
- PCB frame

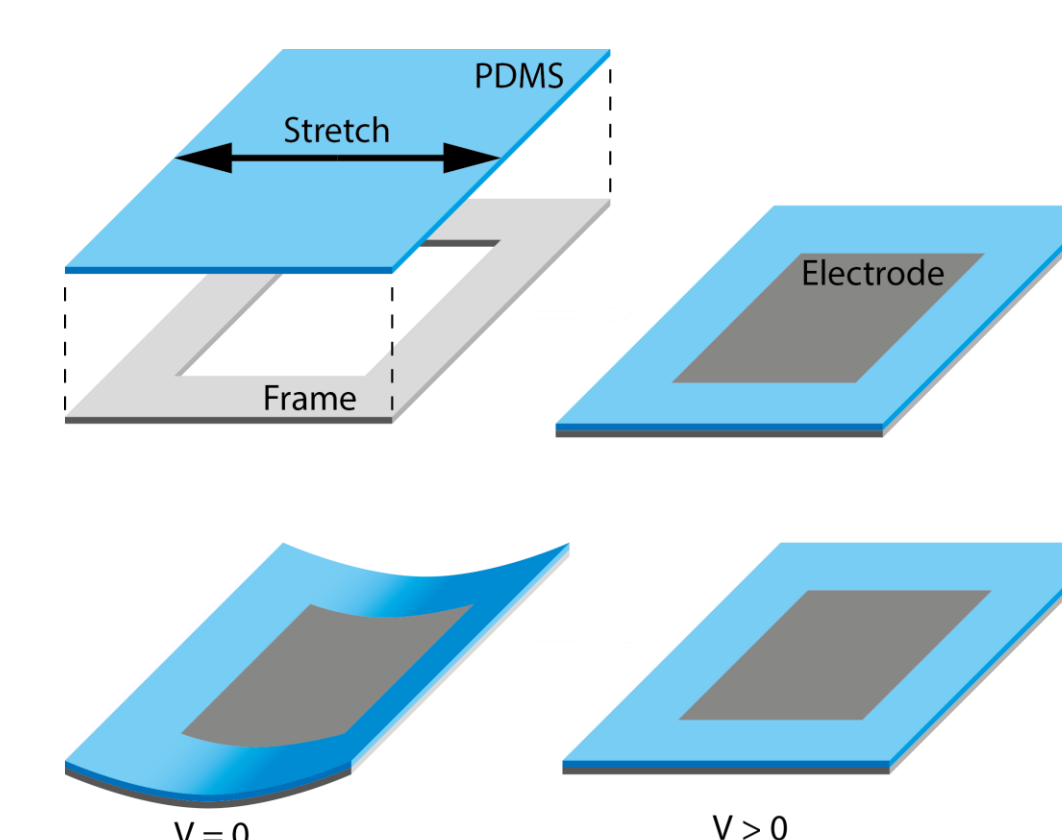
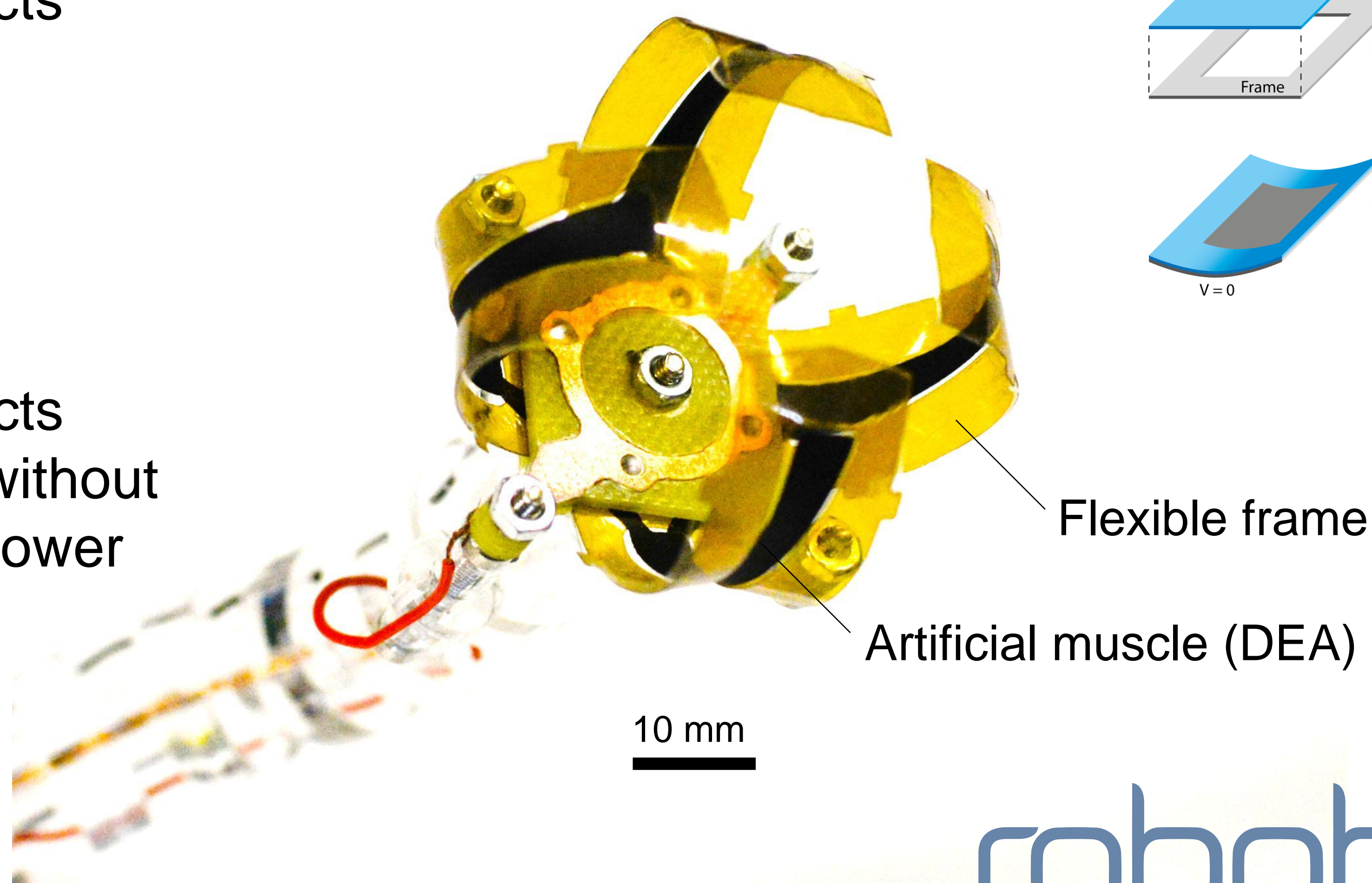
Soft gripper using artificial muscle

Feature:

- Soft touching of objects
- Fast movement
- Thin (~0.1 mm)
- Light weight

Possible use:

- Handling fragile objects
- Long term grasping without the need of electric power



Working principle:
When a stretched DEA is attached to a flexible frame, they form a bent shape.

As the DEA activates, it changes towards flat shape.