Human Interactive Materials (HIM)

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Developing (semi-) conductive liquid crystal elastomer toward an autonomous robot

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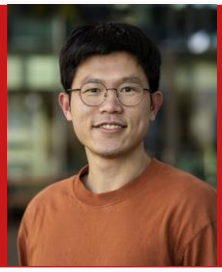


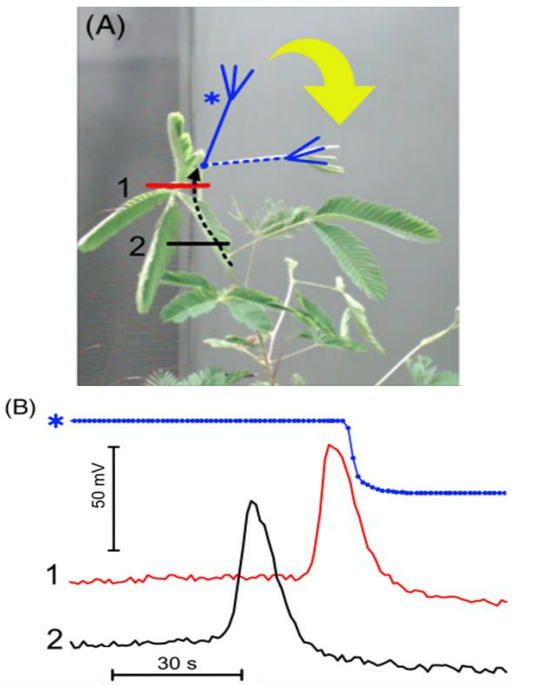
Introduction

In nature, the generation, transmission, and processing of electrical signals are common forms to control the action of plants and animals, such as the reflex arc in the human body, the sequential actuation of mimosa, and so on. The feedback system, consisting of the sensing, processing, and actuating unit, endows the animals and plants with autonomous behaviors.

Project summary

In this project, we plan to develop the **(semi-) conductive liquid crystal elastomer**, which can be used as both an actuating element and sensing element. It will be activated by electricity. Its deformation will be monitored simultaneously. Figures on the right show this concept. Currently, we use the ionic liquid as a medium for conducting electricity.

The next step is to use **new conducting liquid crystal polymers** to assemble devices with specific functions, such as grasping objects.



Mimosa generates and transmits action potentials after being stimulated[1].

[1] Stolarz,et al. *Physiologia Plantarum* 173.4 (2021): 1882-1888.

Project goals

- Develop (semi-) conductive (liquid crystal) materials
- Integrate the materials into an autonomous soft robot
- Analyze robotic functions

Contact information

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