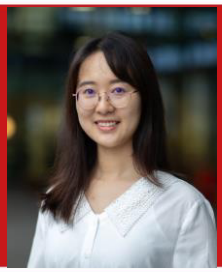
Human Interactive Materials (HIM)

Electrically active surface topographies

Yuxin You and Danqing Liu



Introduction

Surface topographies in nature, such as mammalian goosebumps for heat conservation and cuttlefish textures on their skin for camouflage, have inspired functional surface innovations in research. Previously, we have proposed a design that generates dynamic surface protrusions by using the stimulus of heat and light (Figure 1). In modern applications, such as haptic feedback systems for touch input and the advancements in soft robotics, electricity is the preferred trigger for integrating artificial surfaces into devices.

Project summary

In this project, we aim to develop dynamic surface topographies in thin liquid crystal polymer coatings under an electric field. To achieve this, we will design and fabricate coatings that are responsive to electric stimuli. By applying the electric field, we can precisely control and manipulate the surface structures of these coatings. Furthermore, we will conduct a thorough analysis of the dynamics to gain insights into how they behave under various electric field conditions. This will enable us to optimize the system for enhanced performance and further explore the applications.

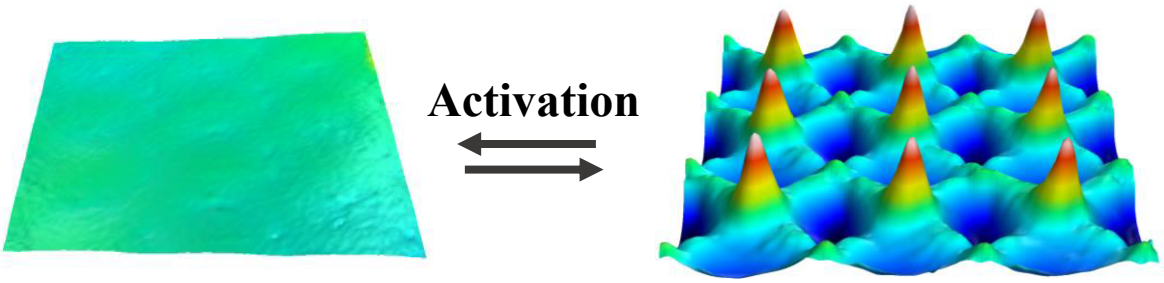


Figure 1: 3D image of the surface topographies

Project goals

Some of goals can include:

- Create dynamic surface topographies by an electric field.
- Characterization of the actuation properties.

Contact information

Feel free to contact me: Yuxin You - y.you1@tue.nl - STO 0.27