

# Embodying intelligence in LCE mechanical metamaterials by harnessing geometrical nonlinearities

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## Introduction

Soft robotics is one of the new subtopics of robotics that facilitates developing designs and robotic functions from compliant materials which enables flexibility and safety for sophisticated and safe human-machine interactions. With new fabrication techniques, autonomous devices with three-dimensional shapes, coatings and actuators can be developed.

## Project summary

In this project, we aim to combine active and inactive components to obtain a hybrid design to enhance mechanical properties and have stimuli-responsive actuation which can be used for soft robotic applications. By taking the advantages of both the mesostructures of metamaterials and capability of liquid crystals to produce anisotropic mechanical response by changing the ordering with respect to a stimuli (heat, light, electricity, etc.) , we can develop intelligent soft robotic devices in macro/micro scales.

## Project goals

I would like to work with a motivated student on a challenging project about developing new design structures and actuation strategies by using hybrid inactive and active/tunable materials with stimuli-responsive sites.

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