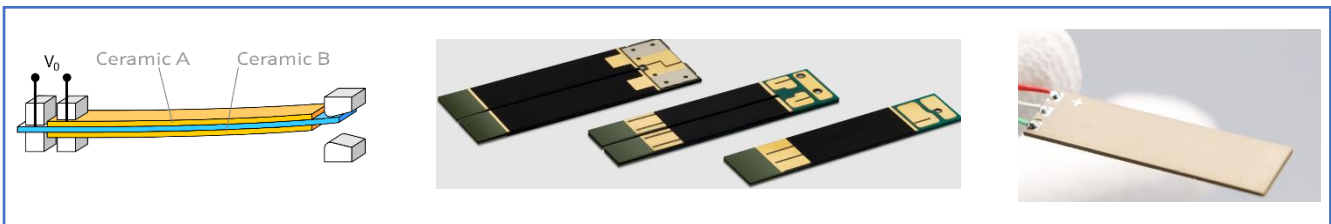


Master Thesis: Optimization of a Piezoelectric beam structure for a Microvalve application

Background:

Piezoelectric materials are a specific class of dielectric materials that exhibit electromechanical coupling. Today, most electronic devices incorporate piezoelectric sensors and/or actuators for various applications such as pressure sensing, energy harvesting, and precision actuation. Despite their widespread use, the possibilities with piezoelectric materials remains still open.

This thesis project focuses on optimizing the performance of a microvalve by enhancing the design of its piezoelectric beam structure. During the project, the student is supposed to investigate and evaluate beam structures of varying shapes and sizes to improve overall valve efficiency.



Tasks:

During your thesis work, you will be involved in the end-to-end development and evaluation of piezoelectric beam stacks to be used in a microvalve. You are responsible for exploring new designs and testing methodologies. This project will include;

- Conducting theoretical studies on piezoelectric materials as actuators and their use as cantilever beam structures.
- Conceptual design of different piezoelectric beam structures.
- Finite Element Analysis (FEA) of the piezoelectric beam structures. (e.g. COMSOL, ANSYS, etc.)
- Fabrication of the piezoelectric stack beams. (e.g. Laser cutting, Adhesion, etc.)
- Characterization of the piezo beam structure and validate the results.
- Designing a PCB circuit to actuate the Piezoelectric beam structure. (Optional)

Your Profile:

The ideal candidate should possess;

- Background in Microsystems, Electrical or Mechanical Engineering
- Experience with FEA software (COMSOL, ANSYS, etc)
- Enjoy performing hands-on experiments
- Strong analytical thinking and problem-solving skills
- Highly motivated and ability to work independently
- Experience in PCB design is a plus.

This project offers unique opportunity to gain experience from Designing, Modelling, Simulation to fabrication and experimental testing.

If you are interested, please submit your resume, motivation letter, and transcript of records in a single pdf via email with the subject header: 'MScThesis_PiezoBeam-Ad01_YOUR-NAME'.

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