

M.Sc. Thesis Proposal

Statically Balanced Micro Mechanical Motion Amplifier

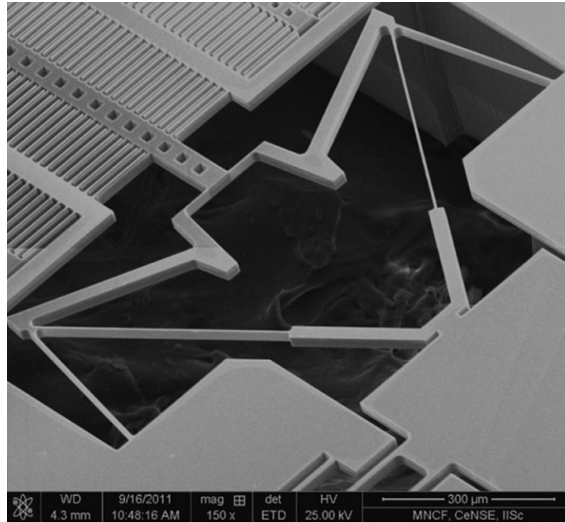


Figure 1. Compliant Mechanical Motion Amplifier.

Challenge: Design a micro mechanical motion amplifier with high mechanical efficiency. The candidate will provide a literature review and generate design concept, and demonstrate proof-of-concept through a series of macro & micro prototypes.

Background: In recent years many compliant mechanisms for amplification of motion were proposed, see for instance **Figure 1**, in which key advantages are the monolithic configuration, possibility for miniaturization, high precision, no backlash and no need for maintenance, etc. The monolithic nature of compliant design also gives rise to a drawback: the elastic deformation of the monolithic structure requires significant force and energy. In other words, the mechanical efficiency is poor, and it takes continuous force to hold the mechanism in position. However, the deformation energy is not dissipated and can therefore be recycled by static balancing. This research aims to design a novel statically balanced motion amplifier and implement the design in micro scale application.

Opportunities: Research development, Design experience using macro & micro fabrication techniques, Finite Elements – ANSYS, close collaboration with an international company, and publishing papers.

Who are we? We are interactive mechanisms and mechatronics group at Precision and Microsystems Engineering (PME) department.

Please contact for more details:

Davood Farhadi Machekposhti (D.Farhadimachekposhti@tudelft.nl)

Nima Tolou (N.Tolou@tudelft.nl)

Just Herder (J.L.Herder@tudelft.nl)