M.Sc. Thesis Proposal

Singularity Elimination of Slider-Crank Mechanism by Means of Elastic Potential Energy
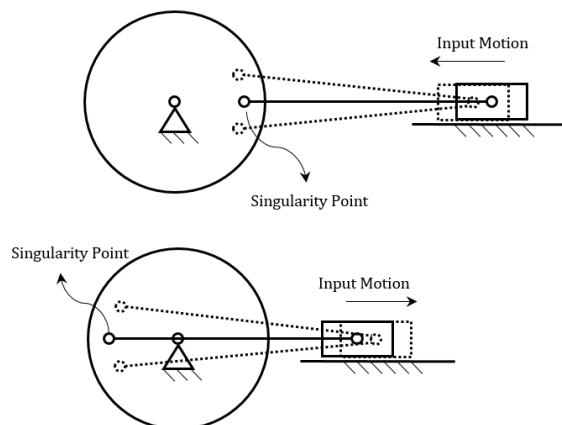

Figure 1a. Singularity points in slider crank mechanism
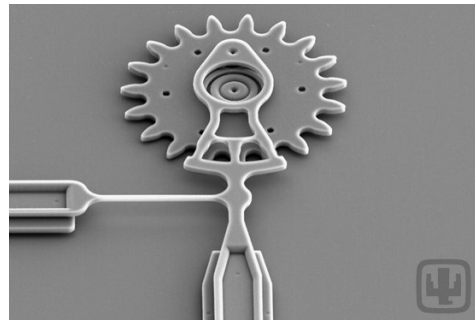
Figure 1b. Sandia Micro Engine

Challenge: Design an elastic suspension to eliminate the singularity points of conventional crank slider mechanisms with the translational motion as input. The candidate will generate theoretical background, design concept, and demonstrate proof-of-concept through a series of macro & micro prototypes.

Background: Crank slider mechanism has been used for converting rotational-to- translational motion and vice versa. However, when the translational motion is the input, there are two singularity points during a full cycle motion, **Figure 1a**. There are different approaches to remove this problem such as using two motors with 90⊙ phase differences, Sandia micro engine **Figure 1b**, potential energy and etc. This research aims to overcome with the singularity problem by using elastic potential energy.

Opportunities: Research development, Design experience using macro & micro fabrication techniques, Finite Elements – ANSYS/COMSOL, 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)