# סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ד׳ 2.12.2020

(ט״ז בכסלו, תשפ״א), בשעה 13:30 באמצעות הזום :

https://technion.zoom.us/j/92471342026

**מרצה**: שי צ׳מני

**מנחה**: פרופ׳/ח ספי גבלי

**על הנושא:**

## ניתוח ההתנהגות המכנית של מבנה דמוי-פרח המורכב מקורות תמירות הנתונות לכפיפה ופיתול

## The mechanical behavior of a flower-like structure comprised from slender rods subjected bending and torsion

The seminar will be given in Hebrew

**תקציר ההרצאה :**

In this talk, I will present and discuss the quasi-static behavior a flower-like structure, namely a structure made of slender rods clamped together at one end and connected to a slider, which can translate along one axis and rotate around it, at the other end. The rods experience large deformation and the resulting flower-like structure exhibits transformation from a compactly folded “flower bud” to an unfolded structure, which is accompanied with a large change in volume occupied by the structure. Such flower-like structures may be useful in a range of engineering applications where a large structure needs to be compactly stored before it is deployed, such as in space and aeronautic applications.

The study involves derivation of the governing equations based on tools from differential geometry and inextensible elastica, which account for large deformations. The set of differential equations is then solved numerically using a combination of Broyden's method and shooting scheme. The first stage of the deformation involves a 2D-problem of a fixed-angle bow, i.e. a slender rod with both ends rotationally fixed, where one end is completely constrained (orientation and displacements), while the other can be translated (only) along the line connecting the two ends of the bow. This stage of the deformation is solved analytically. We find exact analytical solutions for the symmetric case and approximate solutions for the non-symmetric case. These are validated by comparison to experimental measurements, and to the results of the abovementioned numerical scheme.

בברכה,

שירלי אתי סאס

מרכז הסמינרים