

## סמינריון

הנדך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ה' 26.08.2021  
(י"ח באלול, תשפ"א), בשעה 13:30 באמצעות הזום : <https://technion.zoom.us/j/97028774732>

מרצה : דני קסה

מנחה : פרופ' דוד אילתה

על הנושא :

### **A comprehensive investigation of Electrostatic Micro Resonators**

The seminar will be given in Hebrew

תקציר ההרצאה :

Micro electro mechanical systems (MEMS) is a multidisciplinary field, that combines mechanics, electronics and optics. This work focuses specifically, on MEMS resonators.

Electrostatic MEMS resonators are an essential component in filters, sensors and clocking applications. These resonators combine the high quality-factor characteristic of mechanical structures at the microscale, with the efficiency of electrostatic actuation and sensing circuits.

The work will cover three topics: Non-disruptive testing of micro resonators, novel approaches for driving and sensing micro resonators, and novel architectures for parametric resonators and for self-excited oscillators.

Regarding non-disruptive testing, I will present an experimental investigation and numerical validation, which demonstrate that laser vibrometers may disrupt measurements in unexpected ways. This is relevant because laser vibrometers are often used for characterization of MEMS resonators at their development stage.

With respect to driving and sensing micro resonators, I will briefly describe the auto-resonance scheme. This approach seems to be a viable alternative to PLL, and may help to expedite some aspects of measurement procedures. I will also present the harmonic biasing approach, for driving double-sided comb-drive resonators, which improves SNR.

I will present a new surprising scheme for inducing a parametric response in double-sided comb-drive resonators. By simply leaving the rotor electrostatically floating, and minimizing parasitic capacitances, a parametric response can be achieved. Finally, I will present an experimental investigation of methods for extending the life-span of self-excited MEMS Franklin oscillators.

בברכה,

פזל"ח אתי סאס

מרכז הסמינרים