סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ה׳ 23.12.21
(י״ט בטבת, תשפ״ב), בשעה 10:00 באמצעות הזום : https://technion.zoom.us/j/97827304731

<u>מרצה</u> : שחר יחזקאל

<u>מנחה</u> : פרופ׳ אלי אלטוס

על הנושא:

Towards micro-mechanic improved design of granular composites

The seminar will be given in Hebrew

תקציר ההרצאה :

Granular composites are widely used in engineering parts under high loads. Their Macro properties, such as strength, depend on the micro-level morphology of the grains and matrix. Conventional manufacturing processes have limited the capability of controlling the composites' morphology. Recent advances in 3D printing technology, paired with Digital-Image-Correlation (DIC) experimental systems, enables manufacturing "tailor-made" morphologies and measure the entire strain fields.

In this work, 2D eroded Voronoi morphologies which represent a granular composite are studies and their stochastic properties were characterized. Applying the Functional-Perturbation-Method (FPM) combined with Green's Function (GF), the composite's displacement field is approximated semi-analytically as a Fréchet series relative to the average homogenous modulus, for a loading case of uniaxial tension.

The eroded Voronoi dog-bone specimens were 3D printed using PolyJet^{TM} technology with two materials. The strain fields calculated by the FPM and GF were compared to the ones obtained from DIC in uniaxial tension experiments. It was found that most "Hotspots" locations with maximal strain range coincided with those observed experimentally, including the one at the actual fracture initiation spot.

The above method has potential of improving the local morphology at hotspots, to produce better morphologies of high strength applications.

בברכה,
פרופ״מ אמיר סואו
מרכז הסמינרים