

סוג הפרויקט:

גמר מחקרי

Characterization of the nonlinear anisotropic mechanical properties of 3D printed materials and structures from biaxial tests

שם הפרויקט:

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מספר הסטודנטים לפרויקט: פרויקט גמר מחקרי מבוצע על ידי סטודנט יחיד

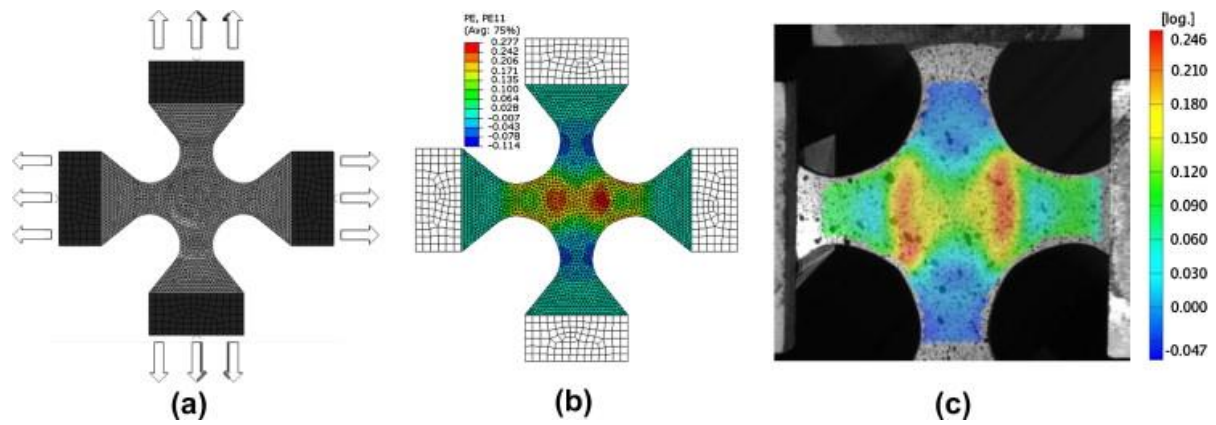
מטרת הפרויקט:

In our lab, we 3D print soft structures using selective laser sintering (SLS) of materials such as TPE and TPU. To characterize their mechanical behavior, we perform biaxial tension and compression experiments, and model their behavior using anisotropic and nonlinear (hyperelastic) continuum models. We then use 3D digital image correlation (3D-DIC) to measure the full-field strain map on the surface of the specimens while simultaneously measuring the forces and displacement. This data is then used to derive the material model's parameters by comparing experimental results and corresponding results from finite element simulations.

תיאור שלבי הפרויקט:

- Literature review
- Learning to use the biaxial testing machine and DIC equipment and software
- Performing experiments
- Analyzing the experimental results
- Developing and running finite element simulations
- Computing material parameters by comparing experimental and numerical results
- Concluding and suggesting future work
- Writing the project report

**When applying to this project, please include your CV and transcript, and what makes you a good candidate for performing this project.**



(a) Numerical model of biaxial test, (b) FEA results of strain distribution in cruciform specimen and (c) experimental strain map obtained by 3D-DIC. (Adapted from Abbassi et al., Materials & Design, 2013).