

# Santhosh Mathesan, Ph.D.

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## CURRENT POSITION

- **Visiting Scientist**, Technion Israel Institute of Technology (Sep 2023 – Till now)

## EDUCATION

- **Ph.D. (Applied Mechanics)** - Jul 2018  
*Thesis: Molecular mechanisms of water diffusion in a strained biopolymer thin film*  
Indian Institute of Technology Madras, India
- **M.E. (Aeronautical Engineering)** - Aug 2012  
*Master's Thesis: Characterization of Paraffin blended fuel for hybrid rocket propulsion*  
Madras Institute of Technology Campus, Anna University, India
- **B.E. (Aeronautical Engineering)** - Apr 2009  
*Bachelor's Thesis: Design and Fabrication of Blended Wing UAV.*  
Hindusthan College of Engineering and Technology, India

## RESEARCH INTERESTS

- Atomistic Simulations - Nanomechanics of Shape-morphing polymers and nano-architected nanoporous metal structures.
- Experiments - Polymer thin film coating, mechanical characterization of polymer thin films and porous polymer nanoparticles for drug loading.

## RESEARCH EXPERIENCE

- **Postdoctoral Research**, Technion Israel Institute of Technology (Mar 2018 – Sep 2023)  
*Effect of topology and morphology on the mechanical characteristics of nanoporous metallic structures.*
- **Doctoral Research**, Indian Institute of Technology Madras, India (Dec 2012 - Mar 2018)  
*Mechanical and diffusion characterization of hygromorphic self-folding biopolymer nanocomposites.*
- **Master Research**, Madras Institute of Technology Campus, India (Jun 2011 – Aug 2012)  
*Characterization of fuels for hybrid rocket propulsion system.*

## TEACHING EXPERIENCE

- **Teaching Assistant**, (Dec 2012 – Mar 2018)  
Indian Institute of Technology Madras, India
- **Lecturer**, (Jun 2009 – Jun 2010)  
RVSCET, Affiliated to Anna University, India

## PUBLICATIONS

1. T. Fedyaeva, **S. Mathesan**, A. Bisht, Z. Liang, D. Mordehai, E. Rabkin, The effects of composition and microstructure on compressive strength of Ag-Au nanoparticles, *Acta Mater.* 261 (2023) 119417.
2. **S. Mathesan\***, D. Mordehai, Displacive-Diffusive plasticity in nanoporous gold nanopillars under tensile creep, *Scr. Mater.* 224 (2023) 115106.
3. **S. Mathesan\***, D. Mordehai, On the yielding and densification of nanoporous Au nanopillars in molecular dynamics simulations, *Comput. Mater. Sci.* 191 (2021) 110307.
4. **S. Mathesan\***, D. Mordehai, Size-dependent elastic modulus of nanoporous Au nanopillars, *Acta Mater.* 185 (2020) 441–452.
5. **S. Mathesan**, M. Tripathy, A. Srivastava, P. Ghosh, Non-affine deformation of free volume during

strain dependent diffusion in polymer thin films, *Polymer*. 155 (2018) 177–186.

6. A. Rath, P.M. Geethu, **S. Mathesan**, D.K. Satapathy, P. Ghosh, Solvent triggered irreversible shape morphism of biopolymer films, *Soft Matter*. 14 (2018) 1672–1680.
7. **S. Mathesan**, A. Rath, P. Ghosh, Insights on Water Dynamics in the Hygromorphic Phenomenon of Biopolymer Films, *J. Phys. Chem. B*. 121 (2017) 4273–4282.
8. A. Rath, **S. Mathesan**, P. Ghosh, Folding behavior and molecular mechanism of cross-linked biopolymer film in response to water, *Soft Matter*. 12 (2016) 9210–9222.
9. **S. Mathesan**, A. Rath, P. Ghosh, Molecular mechanisms in deformation of cross-linked hydrogel nanocomposite, *Mater. Sci. Eng. C*. 59 (2016) 157–167.
10. A. Rath, **S. Mathesan**, P. Ghosh, Nanomechanical characterization and molecular mechanism study of nanoparticle reinforced and cross-linked chitosan biopolymer, *J. Mech. Behav. Biomed. Mater.* 55 (2015) 42–52.
11. Y.K. Sinha, B.T.N. Sridhar, **S. Mathesan**, Thermal decomposition study of HTPB solid fuel in the presence of activated charcoal and paraffin, (2015) 557–565.

\* **Corresponding Author**