Paramveer Sharma

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Education

Programm	Institution	%/CGPA	Year of Completion
M.S. in Aerospace Engg.	Indian Institute of Technology Madras	8.56/10	2018
B.Tech in Mechanical Engg.	Uttar Pradesh Technical University	77.58%	2014
XII	Sarashwati H.S. School Gunour, MP	80.8%	2010
X	Sarashwati H.S. School Gunour, MP	75.6%	2008

Scholastic Achievements

- **Student Innovator of the Year 2017:** Winner of the Student Innovator of the Year, Indian Automotives Technology Innovation Awards (IATIA), by **Auto Tech Review, Springer India**
- **Second Topper:** Achieved the 2^{nd} Position in the institute, during Undergraduate programme

Skills

- **Computational:** Abaqus/CAE (UMAT & VUMAT), Solidworks, Ansys, LAMMPS
- **Programming:** C, Fortran, Matlab, Python (numpy, pandas, scipy, sympy, tensorflow, tkinter)
- **Technical:** FEA, Molecular Dynamics, Machine Learning, Data Analysis, Image Processing

Key Courses

- **Key Courses:** Continuum Damage Mechanics, Multiscale Modelling of Materials, Mechanics of Materials with Microstructurs, Finite Element Analysis, Elasticity, Composite Structures, Aerospace Structures
- **GIAN Course:** Mechanics of Fracture, by Prof. K. Ravichandar, UT Austin, USA

Research Experience

- **Research Assistant, Department of Aerospace Engineering** IIT, Madras
  MS Project: Multiscale Modelling of Damage in UD Composite, Dr. Shantanu S. Mulay Jan'16 – Present
  - Computational Homogenization of UDL RVE of different Fibre-Volume fractions.
  - Determination of Existence of RVE in Elastic, Hardening and Fracture or Damage regime
  - Micromechanical Analysis of Effect of the Fibre-Volume fraction on Fracture Toughness of Composite.
  - Development of Abaqus/Explicit User Subroutine for the study of Softening behaviour of RVE
  - Nonlocal Formulation and Implementation of Continuum Damage Model.

Journal Papers

- **Paramveer Sharma** & Shantanu S. Mulay (2019) Damage modeling of unidirectional laminated composites, ***Mechanics of Advanced Materials and Structures***, *DOI: 10.1080/15376494.2018.1534173*
- **Paramveer Sharma**, Shantanu S. Mulay, On the existence of UD composite RVE in softening zone, ***International Journal of Solids and Structures***, (*submitted*)
- **Paramveer Sharma**, Shantanu S. Mulay , AbaComp: An Abaqus Plugin to automate the process of homogenization in random heterogeneous materials , ***Advances in engineering software***, (manuscript in preparation).

Key Projects

- **Implementation of Integral type Non-Local Explicit Damage model** — IIT Madras
  Part of MS Project, Prof. Shantanu S. Mulay — May'18 – June'18
  - Unique Method has been developed for the implementation of Non-local damage in **Abaqus/Explicit(VUMAT)**, Since there is no in-built process for non-local implementation in Abaqus®
  - Softening behaviour of matrix was simulated, using this Non-Local damage model, and results obtained were free from the any pathological mesh sensitivity
- **Vectorized User Fortran Code for the Lemaitre Damage model** — IIT Madras
  Part of ISRO Sponsored project, Prof. Shantanu S. Mulay — Nov'17 – Jan'18
  - A fast, single equation based stress integration algorithm, for the Lemaitre ductile damage model, has been executed in Abaqus User Fortran code VUMAT.
  - Results obtained from the above implementation were used for RVE determination, in the softening phase
- **Phase Field Model of Thermally Induced Solid-Solid Phase Transitions** — IIT Madras
  ED5053, Mechanics of Materials with Microstructurs, Prof. Srikanth Vedantam — Aug'17 – Nov'17
  - Developed the 1-D phase field model for the material undergoes thermally induced solid-solid phase transitions between two distinct phases, using the **Fried-Gurtin approach**.
  - Derived the constitutive equations which were consistent with the Clausius-Duhem Inequality
- **Building GUI based Plug-In Using OOP interface of Abaqus Python** — IIT Madras
  Part of MS Project, Prof. Shantanu S. Mulay — Jun'17– Jul'17
  - Developed the Unique Plug-in titled **'RVE Homogenization'** using **Python**
  - Plug-In is capable to **fully automate** the process from Model Database(MDB) creation to Output Database (ODB) generation and then complete stiffness matrix computation.
- **Molecular Dynamics Simulation of Plate with hole** — IIT Madras
  MM5015, Multiscale Modelling of Materials, Prof. Anand K Kanjarla — Aug'16 – Nov'16
  - Molecular Dynamics simulation of Ni FCC Crystal was carried out to study the stress/strain distribution in front of propagating crack,using LAMMPS (A Open Source Molecular Dynamics Code)
  - Shrink wrapped (Non-Periodic) and Periodic type BCs was used to Ni FCC box containing small central crack.
- **Delamination at Interfaces using Cohesive Zone Elements** — IIT Madras
  MM5015, Multiscale Modelling of Materials, Prof. Anand K Kanjarla — Aug'16 – Nov'16
  - The Delamination at interface of the double cantilever model of bi-material was modelled by placing the layer of cohesive elements of negligible thickness
  - Max stress based traction-separation laws were used to define the material behaviour of cohesive elements
  - Fracture toughness and stress-strain response after the ultimate stress (delamination onset) were obtained

Positions of Responsibility

- **Founder, Royal Mechanical Buzz** — Chennai, India
  A Mechanical Engg. Students Community Blog — Jul'12 – Present
  - Developed a blog in 2012 titled 'Royal Mechanical Buzz'. I earned $ 2100 US Dollar in **Google Adsense Program** through the blog.
  - Currently, it has 2078 Email Subscriptions and around 100 G+ Followers. The aim was, To solving the general problem and conducting the live Online test, involving Mechanical Engg. domain
- **Team Member, CGBS IIT Madras** — Chennai, India
  Center For Innovation (CFI), IIT Madras — Jan'16 – Jun'18
  - **Cargo Ground Build-up System (CGBS)**, a University Project funded by **Lockhead Martin**, It is an air transportable, remote operated cargo handling vehicle designed for Hercules C-130 aircraft to enable offloading of the cargo at remote locations
  - Handle the various tasks such as Chassis Design, validation of results, Axle design parameter identification etc.

Co-Curricular Activities

- **Inter-Hostel:** Represented the Hostel in Inter Hostel Tennis Tournament 2017
- **TensorFlow Workshop:** Attended the Workshop on "TensorFlow", An open source machine learning framework, organised by Research Affairs Council, IIT Madras