

Education

- **Indian Institute of Technology, Madras** Chennai, India
Master of Science in Aerospace Engineering; CGPA : 8.56/10 Jan'16 – Present
 - Thesis Title: Multiscale Modelling of Damage in UD Composites
- **Uttar Pradesh Technical University, Lucknow** Lucknow, India
B.Tech in Mechanical Engineering; Percentage: 77.58% Jul'10 – Jun'14
 - Project Title: Analysis and Experimental study of Hovercraft

Research Experience

- **Research Assistant, Department of Aerospace Engineering** Chennai, India
Research Advisor: Dr. Shantanu S. Mulay, IIT, Madras Jan'16 – Present
 - Computational homogenization of UDL RVE of different Fibre-Volume fractions.
 - Determination of existence of RVE in elastic and hardening regime
 - Micromechanical Analysis of effect of the Fibre-Volume fraction on fracture toughness of composite.
 - Development of VUMAT Abaqus/explicit subroutine for crack propagation in UDL composites.
 - Nonlocal formulation and implementation of continuum damage model.

Journal Paper Submission

- **Paramveer Sharma, Shantanu S. Mulay (2018), Damage Modelling of Unidirectional Laminated Composite, *Mechanics of Advanced Materials and Structures*, (paper under review)**

Academic Projects

- **Implementation of Integral type Non-Local Explicit Damage model** Chennai, India
Advisor: Dr. Shantanu S. Mulay, Dept. of Aerospace Engg, IIT Madras 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** Chennai, India
Advisor: Dr. Shantanu S. Mulay, Dept. of Aerospace Engg, IIT Madras 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, using failure zone averaging scheme
- **Phase field model of thermally induced solid-solid phase transitions** Chennai, India
Advisor: Dr. Srikanth Vedantam, Dept. of Engineering Design, IIT Madras 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 second law of thermodynamics
 - Specialized the governing equations for modeling the effect of inter-facial resistance during phase transitions
- **Building GUI based Custom Plug-In in Abaqus/CAE Using Python** Chennai, India
Advisor: Dr. Anand Kanjarla, Dept. of Metallurgical and Materials Engg, IIT Madras Jun'17– Jul'17
 - Developed the Unique Plug-in titled '**RVE Homogenization**' using **Python**
 - The plugIn is capable to fully automate the process from model generation to complete stiffness matrix computation.

- It takes the set of inputs such as model information and Individual Material properties which further used to computes the homogenized properties

- **Molecular Dynamics Simulation of Plate with hole** Chennai, India
Advisor: Dr. Anand Kanjarla, Dept. of Metallurgical and Materials Engg, IIT Madras 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.
 - Minimization of energy was done by conjugate gradient algorithm and using NVE ensemble the system iteratively brought to desired temperature. Pair potential used for the system was Ni99.eam.alloy
- **Delamination at interfaces using Cohesive Zone Elements** Chennai, India
Advisor: Dr. Anand Kanjarla, Dept. of Metallurgical and Materials Engg, IIT Madras Aug'16 – Nov'16
 - The Delamination at interface of 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
HTTP://ROYALMECHANICALBUZZ.COM Jul'12 – Present
 - Developed a blog in 2012 titled 'Royal Mechanical Buzz'. It was the Open Community forum type blog. I earned \$ 2100 US Dollar in **Google Adsense Program** within 1.2 years through the blog. Within a small span of time, it reached 1000 Online Subscribers.
 - Currently, it has 2078 Email Subscriptions and around 100 G+ Followers. The aim was for solving general Problem and conducting the live Online test, involving Mechanical Engg. Domain
- **Team Member, CGBS IIT Madras** Chennai, India
CGBS IITM - University project funded by **Lockhead Martin** at IIT Madras Jan'16 – Jun'18
 - CGBS is an air transportable, remote operated cargo handling vehicle designed for the Indian Air Force's Hercules C-130 aircraft to enable offloading of the cargo at remote locations
 - Handle the various tasks such as Structural Components Design, validation of results, Axle design parameter identification etc. The main task was the design of a full-fledged chassis of vehicle with the minimum weight that can cable to sustain cargo weight, subject to various static and dynamic load.
- **Co-Ordinator, Placement** Chennai, India
Placement Team 2018 Aug'18 – Present
 - Coordinated with students and companies to organize and manage campus placements at IIT Madras for December 2018
 - Helped in organizing the tests and interviews smoothly before and during placement season in 2018 – 19

Scholastic Achievements

- **Student Innovator of the Year 2017:** As a Part of *CGBS IIT Madras*, we won the Student Innovator Award of the Year 2017 at IATIA² 2017 Awards Ceremony, organised by **Auto Tech Review**, *Springer India*, and awarded the monetary fund for the project support
- **HTRA (Research Assistantship):** Received HTRA for the entire duration of M.S. Degree
- **Second Topper:** Achieved the 2nd Position in the institute, during Undergraduate programme

Course Work

- **Key Courses:** Continuum Damage Mechanics, Multiscale Modelling of Materials, Engineering Plasticity, Mechanics of Materials with Microstructures, Elasticity, Continuum Mechanics, Composite Structures, Mechanics of Damage Tolerance, Aerospace Structures
- **Short term Course:** GIAN* Course on 'Mechanics of Fracture', conducted by Prof. Krishnaswamy Ravichandar, University of Texas at Austin, USA and Dr. K. Ramesh, IIT Madras

Skills

- **Scientific Software's:** Abaqus/CAE (UMAT & VUMAT), Solidworks, Ansys, LAMMPS**
- **Programming:** C, Fortran, Matlab, Python (numpy, pandas, scipy, tensorflow)
- **Web/Typography:** HTML, CSS, L^AT_EX, Microsoft Office Suite
- **Operating Systems:** Proficient in Windows and Linux OS

Extra Curricular

- **Inter-Hostel:** Represented the Hostel in Inter Hostel Tennis Tournament 2017
- **International Day of Yoga:** Attended and Participated in International Day of Yoga, an event organised by Dean of Students, IIT Madras