DEVESH TIWARI

📞 +1 213-643-8710 ✉ devesh@ucsb.edu ✉ tdevesh1401@gmail.com

Education

Doctor of Philosophy in Materials — **CPI: -/-**
University of California, Santa Barbara, USA — *July 2023 – present*

Master of Science in Mechanical Engineering — **CPI: 3.85/4**
University of Southern California, Los Angeles, USA — *Aug. 2022 – July 2023*

Master of Technology in Aerospace Engineering — **CPI: 9.5/10**
Indian Institute of Technology, Kanpur, India — *July 2019 – Aug. 2021*

Bachelor of Technology in Mechanical Engineering — **Percentage: 82.48 %**
Bundelkhand Institute of Engineering and Technology, Jhansi, India — *Aug. 2015 – May 2019*

Higher Secondary School — **Percentage: 89.80 %**
Central Board of Secondary Education, India — *July 2012 – May 2014*

Secondary School — **CGPA: 9.8/10**
Central Board of Secondary Education, India — *July 2010 – May 2012*

Work Experience

Project Engineer — **Sep. 8, 2021 – July 2022**
Indian Institute of Technology, Kanpur, India   *In coordination with : Hydro-Québec Research Institute (IREQ), Canada*

- Worked on a research project titled "Microscale modeling of steels". Contributed in developing a MPI based parallel user-code for a large deformation non-local crystal plasticity model and developing an adoptive meshing technique for gradient microstructures that can also be utilized in phase-filed simulations.

Research Projects

Master of Science Thesis | *USC* | *Advisor : Dr. Ananya Renuka Balakrishna* — **Aug. 2022 - Present**
Thesis title: Microstructural Design of Light-Induced Phase Transformation Materials.

- Developed a continuum theory to investigate how structural transformations and microstructural evolution pathways (under a light stimulus) govern the bending and twisting modes of deformation in photochromic chiral salicylideneamine molecular crystal.
- Our theoretical framework provides quantitative insights into the interplay between phase transformation kinetics and macroscopic deformations, and could serve as a design tool to microstructurally design light-interactive materials.

Master of Technology Thesis | *IIT Kanpur* | *Advisor : Dr. Pritam Chakraborty* — **June 2020 - Aug. 2021**
Thesis title: A Diffused Interface Non-local Crystal Plasticity Model to Capture Hall-Petch Effect in Polycrystals.

- Developed an energy-penalty based grain boundary model within the framework of non-local CPFEM to understand micromechanism of slip transmission across grain boundaries and its effect on elasto-plasctic response of polycrystals.
- The developed finite element framework can accurately capture the micromechanism of dislocation pile-up and strain gradient plasticity.

Non-linear Finite Element Code Development | *IIT Kanpur* — **Jan 2020 - May 2020**

- Developed a Finite Element code including post-processing in MATLAB for solving generic one-dimensional problems having material transitions.
- Developed a two-dimensional non-linear CPFEM code for visco-elastoplastic materials using implicit time integration scheme.

Bachelor's Project | *BIET Jhansi* | *Advisor : Dr. Narendra Kumar* — **June 2018 - May 2019**
Project title: Optimization of Process Parameters in CNC End Milling of Aluminium 6082 Alloy Using Taguchi Design Method.

- Experiments were designed based on the established Taguchi design of experiments technique with L9 orthogonal array.
- Optimization of Surface roughness and Material removal rate were performed for predicting their correlation with machining parameters (Cutting speed, Feed rate and Depth of cut).

Conference Presentations

Workshop on Data-Driven and Computational Modeling of Materials Across Scales   May 10-12, 2023
Title: Micromechanics of Dynamic Materials.   *UCLA, USA*
- Authors: **Devesh Tiwari**, Ananya Renuka Balakrishna.

Materials Research Outreach Program Symposium   January 25-26, 2023
Title: Microstructural Design of Light-Induced Phase Transformation Materials.   *UCSB, USA*
- Authors: **Devesh Tiwari**, Ananya Renuka Balakrishna.

66th Congress of the Indian Society of Theoretical and Applied Mechanics   December 3-5, 2021
Title: A Non-local Crystal Plasticity Model to Capture Hall-Petch Effect in Polycrystals.   *VIT-AP, India*
- Authors: **Devesh Tiwari**, Daniel Paquet, Pritam Chakraborty.

16th U.S. National Congress on Computational Mechanics (USNCCM16)   July 25-29, 2021
Title: A Diffused Interface based Non-local Crystal Plasticity Model with Biased Mesh and Hanging Nodes.   *Chicago, USA*
- Authors: Pritam Chakraborty, **Devesh Tiwari**, Jothi Mani Thondiraj, Pierre-Antony Deschênes, Daniel Paquet.

Scholastic Achievements

Regents Central Fellowship | *Materials Department, UCSB* : The fellowship award is given every year to one student of the incoming batch of graduate students in recognition of outstanding academic promise.

Provost Top Off Travel/Research Award | *Department of Aerospace and Mechanical Engineering, USC* : The competitive award is given to selected graduate students based on their academics and research.

Provost Fellowship | *Department of Aerospace and Mechanical Engineering, USC* : The fellowship award is given every year to selected graduate students in recognition of outstanding academic promise.

Academic Excellence Award | *Department of Aerospace Engineering, IIT Kanpur* : The award is given every year to top 10% of the students based on their academic performances.

Achiever of the Year Award | *Department of Mechanical Engineering, BIET Jhansi* : One student of the graduating batch is honored with this award every year based on overall academic and extracurricular achievements.

Aryabhata Award | *J B Academy, Faizabad* : Received the honor for scoring maximum in maths in the secondary school examination.

Others : Secured All India Rank 1402 (99.16 percentile) among 167376 students in Mechanical Engineering paper of GATE 2019. Qualified JEE (Advanced) 2015 with All India Rank 19158 and secured 97.23 percentile in JEE(Main) 2015.

Technical Skills

Softwares and Tools: COMSOL, MOOSE, Abaqus, AutoCAD, LaTeX, Microsoft Office

Programming: FORTRAN, C (Basics), Python, MATLAB, Mathematica

Relevant Coursework

- Solid Mechanics
- Finite Element Method
- Thermodynamics
- Molecular Dynamics
- Composite Materials
- Fatigue and Fracture
- Manufacturing Science
- Dynamics & Vibration

English Proficiency

TOEFL: 108/120 (Reading: 29, Listening: 29, Speaking: 24, Writing: 26)

Training and Certifications

Machine Learning Certification | *Online certification course offered through Coursera by Stanford University* : Learned about basic supervised and unsupervised learning algorithms like regression, support vector machine, clustering, principal component analysis.

Vocational Training | *National Thermal Power Corporation Limited, Tanda* : Learned about functioning of thermal power plants and submitted the training report under turbine maintenance section.

Summer Internship | *Bharat Heavy Electricals Limited, Jhansi* : Experienced the industrial environment of manufacturing electric transformers, diesel and electric locomotives. Submitted a project report on CNC flame cutting machine.

Training on AutoCAD | *Online winter training throgh Internshala Trainings* : Learned about designing and drafting of basic three dimensional models.

Positions of Responsibility

Coordinator : Departmental Post Graduate Committee   **Jan. 2021 – May 2021**
Department of Aerospace Engineering, IIT Kanpur
- Helped in conducting entrance examinations and document verification for MTech and PhD admissions.

Graduate Teaching Assistant   **Aug. 2020 – Dec. 2020**
Department of Aerospace Engineering, IIT Kanpur   *Course: AE684A - Aircraft Materials and Processes*
- Helped in conducting semester examinations and evaluating answer scripts.

Senior Executive : Society of Aerospace Engineers   **Aug. 2019 – May 2021**
Department of Aerospace Engineering, IIT Kanpur
- Helped in organising various webinars, workshops, technical talks and other departmental events.

Alumni Cell Head : Mechanical Engineering Forum   **Aug. 2017 – July 2018**
Department of Mechanical Engineering, BIET Jhansi
- Helped in coordinating with alumni association to promote and organize various events and facilities.