SUBODH CHANDRA SUBEDI

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EDUCATION

PhD in Mechanical Engineering August 2024
University of Wisconsin–Madison, USA GPA: 3.71
Thesis: Support Structure Optimization for LPBF-based Metal AM

Master of Science in Mechanical Engineering August 2020
University of Wisconsin–Madison, USA GPA: 3.71

Master of Science in Mechanical Engineering December 2017
University of North Dakota, USA GPA: 4.0
Thesis: Rolling Contact Fatigue of Solid and Hollow Disks

Bachelor of Technology in Mechanical Engineering December 2012
MNNIT, Allahabad, India GPA: 7.35/10

ENGINEERING EXPERIENCE

Structural Analyst Engineer
Sept 2024 – Present
PACCAR Technical Center, WA

- Structural analysis of truck components.
- Structural and dynamic simulations at component, subassembly, and full-vehicle levels.
- Durability predictions under road excitations and engine inputs.
- Design validations using numerical and physical testing.
- Design optimization of truck components.
- ML-AI in design simulations.

Research Assistant
Jan 2019 – Aug 2024
University of Wisconsin–Madison
Engineering Representation and Simulation Lab
Alloy Design and Development Lab

- **Support Structure Optimization for Metal Additive Manufacturing:** Designed novel truss-type support structures and validated optimized supports through LPBF printing. Computational tools delivered to US NAVY and US ARMY.
- **Geometric Postprocessing of Topology Optimized Designs:** Reviewed commercial post-processing solutions and proposed new geometric reconstruction methods for topology optimized designs.
- **Formula 1 Upright Design Challenge (Topology Optimization Roundtable 2019, NM, USA):** Designed and manufactured car upright with 90% weight reduction using topology optimization and additive manufacturing.
- **3D Printed Tactile Maps for Visually Impaired:** Created tactile campus maps for visually impaired individuals and fabricated using polymer 3D printers.
- **In-process Failure Investigation in Ceramic 3D Printing:** Defined and modeled build process failures using computational and experimental tools.

Course Instructor
May 2024 – Aug 2024
University of Wisconsin–Madison, ME 342 (Machine Component Design)

- Taught failure theories, safety factors, reliability analysis, high cycle fatigue, material and component selection.
- Covered body and surface stresses and component reliability based on property and load distribution.

Teaching Assistant Jan 2019 – May 2024
University of Wisconsin–Madison, ME 331 (Computer-Aided Engineering); ME 548 (Intro to Design Optimization)

- Restructured ME 331 to include FEA, design optimization.
- Taught GD&T, ASME Y14.5, advanced modeling, analysis, and optimization using SolidWorks and MATLAB.
- Assisted ME 548 instructor in design optimization using MATLAB and SolidLab.

Teaching Assistant Aug 2015 – Nov 2017
University of North Dakota

- Teaching assistant for courses in Finite Element Analysis, Design of Machinery, and Engineering Ethics.
- Designed FSAE car suspension with optimized anti-sway bars using ANSYS.
- Designed a notification system for navigation and mobility of visually impaired individuals using personalized audio signals.

Mechanical Engineer Dec 2012 – Aug 2015
Nepal Hydro & Electric Limited, Nepal

- Designed, manufactured, and tested hydro-mechanical steel structures.
- Conducted project and contract management and engineering feasibility studies.
- Trained engineering staff on using AutoCAD and CNC plasma cutting systems.

WORKSHOPS/OUTREACH

- Designed and led a 10-day workshop titled "Introduction to Computer-Aided Engineering" for middle and high school students, August 2018, UW–Madison.
- Lea d 1-day workshop titled "Learning Topology Optimization through Examples and Case Studies" at ASME IDETC-CIE Conference, August 2019, Anaheim, CA.

LEADERSHIP / VOLUNTEERING EXPERIENCE

- Research Mentor, Lumiere Foundation (Sept 2024 – Present).
- Panelist and Moderator – Diversity Forum, UW–Madison 2024.
- Wisconsin Experience Bus Trip, 2023.
- Judge – Capital Science and Engineering Fair, Madison, WI, 2019, 2022, 2023, 2024.
- Judge – North Dakota First Lego League State Championships, 2016 and 2017.
- Participant – Jagriti Yatra 2011, international initiative on Innovation and Enterprise-Led Development.

AWARDS

- NSF-funded Student Registration Fee Waiver Award for Solid Freeform Fabrication (SFF) Conference 2021–2024, Austin, TX.
- Student Grants Research Competition (SRGC) Presentation Award 2019 and 2022, Graduate School, UW–Madison.
- First Prize, Big Idea Challenge, UND College of Engineering & Mines, Oct 2017.
- Second Prize, Startup Weekend, Grand Forks, ND (Oct 2015).
- Participant, Jagriti Yatra 2011, international initiative on Innovation and Enterprise-Led Development.

CERTIFICATIONS / TRAININGS

- Morgridge Entrepreneurial Bootcamp, UW–Madison 2023.
- Research Mentor Training 2023, Center for Integration of Research, Teaching and Learning.
- Research Mentor Training 2023, Delta Program, UW–Madison.

AFFILIATIONS / MEMBERSHIP

- International Student Advisory Board 2022–23, International Student Services, UW–Madison.
- International Peer Mentor 2016–17, Office of International Programs, UND.
- Member, Student Advisory Board, College of Engineering and Mines, UND.
- American Society of Mechanical Engineers (ASME).
- The Minerals, Metals & Materials Society (TMS).
- American Society of Engineering Educators (ASEE).
- Society of Automotive Engineers (SAE).

JOURNAL PUBLICATIONS

1. **S.C. Subedi**, D.J. Thoma, K. Suresh, *Deformation constrained support-structure optimization for laser powder bed fusion*, *Additive Manufacturing*, Volume 89, 5 June 2024, 104294.
2. **S.C. Subedi**, A. Shahba, M. Thevamaran, D.J. Thoma, K. Suresh, *Towards the optimal design of support structures for laser powder bed fusion-based metal additive manufacturing via thermal equivalent static loads*, *Additive Manufacturing*, 57 (2022) 102956.
3. **S.C. Subedi**, C.S. Verma, K. Suresh, *A review of methods for the geometric post-processing of topology optimized models*, *Journal of Computing and Information Science in Engineering*, 20 (2020) 060801.
4. **S.C. Subedi**, M. Zahui, *Audio frequency induction loop system (AFILS) for orientation and mobility*, *International Journal of Innovative Technology and Creative Engineering*, 9 (2019).
5. M. Zahui, S. Deshmukh, **S.C. Subedi**, *Variable slip ratio rolling contact fatigue tester*, *Journal of Testing and Evaluation*, 46 (2018) 1042–1053.

PEER-REVIEWED CONFERENCE PAPERS

1. **S.C. Subedi**, K. Suresh, *Predictive Modeling of Drying Process in Clay 3D printing*. 35th Annual International Solid Freeform Fabrication Symposium, 2024.
2. **S.C. Subedi**, K. Suresh, *Using Topology Optimization in an Undergraduate Classroom Setting*, ASEE Annual Conference & Exposition, 2022.
3. **S.C. Subedi**, D.J. Thoma, K. Suresh, *Optimal Truss-Type Supports for Minimal Part Distortion in LPBF*, 33rd Annual International Solid Freeform Fabrication Symposium, 2022.
4. **S.C. Subedi**, D.J. Thoma, K. Suresh, *Truss-type support structures for SLM*, 32nd Annual International Solid Freeform Fabrication Symposium, 2022.
5. **S.C. Subedi**, M. Zahui, *Determination of Optimum Hollowness of Normally Loaded Circular and Square Rings with Central Holes*, ASME International Mechanical Engineering Congress and Exposition, 2017.
6. **S.C. Subedi**, J. Logan, M. Zahui, *Simplified approach for Formula SAE car suspension design and component size optimization using finite element method*, ASME IMECE, 2017.
7. **S.C. Subedi**, M. Zahui, *Assistive Pedestrian Audio Loop for Visually Impaired*, 23rd International Congress on Sound and Vibration (ICSV23), Athens, Greece, 2016.

BOOK CHAPTER

1. T. Kumar, **S.C. Subedi**, K. Suresh, *Modern Design for Manufacturing*. *Encyclopedia of Materials: Metals and Alloys*, Elsevier, p.162–167, 2022.

POSTERS / PRESENTATIONS

1. *Part Deformation Constrained Multi-Load Support Optimization for Laser Powder Bed Fusion*, SFF Symposium, Austin, Texas, 2024.
2. *Multi-load Support Optimization for Minimizing Part Deformation in LPBF*, SFF Symposium, Austin, Texas, 2023.
3. *Optimal Truss-type Supports for Minimal Part Deformation in LPBF*, SFF Symposium, Austin, Texas, 2022.
4. *Using Topology Optimization in an Undergraduate Classroom Setting*, ASEE Annual Conference, Minneapolis, 2022.
5. *Truss-type Support Structures for SLM*, SFF Symposium, Austin, Texas, 2021.
6. *Rethinking Design in Mechanical Engineering – Research Meets Undergraduate and K-12 Education*, UW–Madison Education Research Fair, 2019.
7. *Towards Parametric CAD Model Recovery from Topology Optimized Models*, TopOpt Roundtable, Albuquerque, NM, 2019.