

SUBODH CHANDRA SUBEDI

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PhD Candidate in Mechanical Engineering with a strong background in CAD, FEA, and advanced manufacturing. Experienced in DFM, failure analysis, topology optimization, GD&T, Solid modeling, and 3D Printing.

EDUCATION

PhD in Mechanical Engineering, University of Wisconsin-Madison, USA Thesis: Support Structure Optimization for LPBF-based Metal AM	May 2024 GPA: 3.71
Master of Science in Mechanical Engineering, University of Wisconsin-Madison, USA	August 2020 GPA: 3.71
Master of Science in Mechanical Engineering, University of North Dakota, USA Thesis: Rolling Contact Fatigue of Solid and Hollow Disks	December 2017 GPA: 4.0
Bachelor of Technology in Mechanical Engineering, MNNIT, Allahabad, India	December 2012 GPA: 7.35/10

ENGINEERING EXPERIENCE

Research Assistant, Jan 2019 - Present

Engineering Representation and Simulation Lab, UW-Madison

Alloy Design and Development Lab, UW-Madison

Support Structure Optimization for Metal Additive Manufacturing

- Designed novel truss-type support structure for metal additive manufacturing.
- Validated the structural integrity of truss-type supports for LPBF machine, ensuring optimal performance and reduction of material waste by over 80%.
- Innovative computational support optimization solutions delivered to the US Army and US NAVY

Geometric Postprocessing of Topology Optimized Designs

- Reviewed existing commercial solutions for geometric post-processing of TO designs.
- Proposed new methods for geometric post-processing of complex topology optimized designs.

Formula 1 Upright Design Challenge, Topology Optimization Roundtable 2019, NM, USA

- Designed and manufactured car upright with 90% less weight for a given multi-load problem using topology optimization and additive manufacturing.

3D printed Tactile Maps for Visually Impaired

- Created tactile maps of campus for easy navigation, orientation, and mobility for visually impaired individuals.
- Printed maps using polymer 3D printers to usable form factor.

In-process Failure Investigation in Ceramic 3D Printing

- Defined failures in ceramic 3D printing
- Modelled the build process to predict part build failures using computational and experimental tools.

Teaching Assistant, Jan 2018- Dec 2019

UW-Madison

ME 331 (Computer-Aided Engineering)

- Restructured the course to include FEA, size and topology optimization
 - Teach GD&T, advanced modelling, analysis, and optimization using SolidWorks, MATLAB
- ME 548 (Intro to Design Optimization)
- Assist course instructor in design optimization course using MATLAB, SolidLab

Teaching Assistant, Aug 2015 – Nov 2017

UND

FSAE Car Suspension Design

- Designed FSAE cars suspension with optimized anti-sway bars using ANSYS

Assistive Pedestrian Audio Loop for Visually Impaired

- Design a notification system for easy navigation and mobility for 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
- Performed Project and Contract management.
- Carried out Engineering Feasibility Studies
- Trained engineering staffs on using AutoCAD, CNC Plasma Cutter

LEADERSHIP/VOLUNTEERING EXPERIENCE

- Designed and led 10-day workshop titled 'Introduction to Computer-Aided Engineering' for middle and high school students, August 2018, UW-Madison
- Led a 1-day workshop titled 'Learning Topology Optimization through Examples and Case Studies' at ASME IDETC-CIE Conference, August 2019, Anaheim, CA
- Judge – Capital Science and Engineering Fair, Madison, WI, 2019, 2022, 2023
- Judge – North Dakota First Lego League State Championships, 2016 and 2017
- Wisconsin Experience Bus Trip, 2023
- Jagriti Yatra 2011, an international initiative on Innovation and Enterprise Led Development

SKILLS

- Programming and Simulation Languages: MATLAB, Python
- Design, Modeling and Optimization: SolidWorks, ANSYS, CREO, Rhino, nTopology, Abaqus
- Additive Manufacturing Preprocessing Tools: Cura, Materialize Magics
- Additive Manufacturing Machines: EOS M-290, Ultimaker

AWARDS

- NSF-funded Student Registration Fee Waiver Award for Solid Freeform Fabrication (SFF) Conference 2021, 2022, & 2023, Austin, TX
- Student Grand Research Competition (SRGC) Conference Presentation Award 2019 and 2022, Graduate School, UW-Madison
- First Prize, Big Idea Challenge, UND College of Engineering & Mines, ND, Oct 2017
- Second prize in Startup Weekend, Grand Forks, ND (16-18 October 2015)
- Jagriti Yatra 2011, an international initiative on Innovation and Enterprise Led Development
- COMPEX Scholarship by Government of India for B. Tech in Mechanical Engineering, 2008

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, Intl Student Services, UW-Madison
- International Peer Mentor 2016-17, Office of International Programs, UND
- Member - Student Advisory Board, Office of Dean, College of Engineering and Mines, UND
- American Society of Mechanical Engineers (ASME)
- American Society of Engineering Educators (ASEE)

SELECT PUBLICATIONS

- Subedi, S., Thoma, D.J. and Suresh, K., 2023. Multi-load Optimization of Support Structures for Minimizing Part Deformation in Laser Powder Bed Fusion, (*under review*)
- Subedi et.al, Towards the Optimal Design of Support Structures for Laser Powder Bed Fusion-Based Metal Additive Manufacturing via Thermal Equivalent Static Loads, *Additive Manufacturing Journal*, Volume 57, September 2022, 102956
- Subedi, S.C., Thoma, D.J. and Suresh, K., 2022. Optimal Truss-type Supports for Minimal Part Deformation in LPBF. *International Solid Freeform Fabrication Symposium. University of Texas at Austin, 2022*
- Subedi, S.C., Verma, C.S. and Suresh, K., 2020. A review of methods for the geometric post-processing of topology optimized models. *Journal of Computing and Information Science in Engineering*, 20(6), p.060801.
- Subedi, S.C., and Suresh, K., Using Topology Optimization in an Undergraduate Classroom Setting, *ASEE Annual Conference 2022, Minneapolis, USA*
- Subedi, S.C., Thoma, D.J. and Suresh, K., 2021. Truss-Type Support Structures for SLM. *International Solid Freeform Fabrication Symposium. University of Texas at Austin, 2021*
- Kumar T, Subedi, S.C., Suresh K. Modern Design for Manufacturing. *Encyclopedia of Materials: Metals and Alloys, Elsevier, p162- 167, 2022*

POSTERS/PRESENTATIONS

- Multi-load Support Optimization for Minimizing Part Deformation in LPBF, SFF Symposium, Austin, Texas, Aug 2023
 - Optimal Truss-type supports for minimal part deformation in LPBF, *SFF Symposium, Austin, Texas, July 2022*
 - Using Topology Optimization in an Undergraduate Classroom Setting, *ASEE Annual Conference, Minneapolis, June 2022*
 - Truss-type Support Structures for SLM, *SFF Symposium, Austin, Texas, August 2021*
 - Rethinking Design in Mechanical Engineering – Research Meets Undergraduate and K-12 Education, *UW-Madison Education Research Fair, Feb-2019*
 - Towards Parametric CAD Model Recovery from Topology Optimized Models, *TopOpt Roundtable, Albuquerque, NM, Mar – 2019*
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