Sanjita Wasti

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Education

- **University of Tennessee Knoxville (UTK)** — Knoxville, USA
  Ph.D. in Mechanical Engineering; GPA: 4 — *Aug 2020 - Aug 2024*
- **Auburn University** — Auburn, USA
  M.S. in Biosystems Engineering; GPA: 4 — *Aug 2018 - Aug 2020*
- **Tribhuvan University, Thapathali Campus** — Kathmandu, Nepal
  Bachelor's in Mechanical Engineering; Cumulative Percentage: 79.92 — *Nov 2013 - Nov 2017*

Experience

- **Postdoctoral Research Associate** — Oct 2024 - present
  Sustainable Manufacturing Technologies, Oak Ridge National Laboratory
  - **Summary**: Working on multiple projects related to the development of sustainable feedstocks and their integration into advanced manufacturing processes.
- **Graduate Teaching and Research Assistant** — Aug 2020 - Aug 2024
  Department of Mechanical, Aerospace and Biomedical Engineering,UTK
  - **Summary**: Worked as an integral part of East Tennessee ecosystem, comprising UTK Fibers and Composites Manufacturing Facility (FCMF), IACMI-The Composites Institute, Manufacturing Demonstration Facility (MDF) at ORNL, and industry partners. Engaged in a significant Department of Energy (DOE) program (Hub and Spoke program) with the University of Maine, Composites Center.
  - **Advisor: Dr. Uday Vaidya, Dissertation topic - Utilization of Coir Fiber Reinforced Composites for Automotive Applications**:
    - Led research to enhance coir fiber properties through alkali treatment and fiber sizing.
    - Optimized sizing processes for natural fiber systems.
    - Studied the impact of fiber sizing on mechanical, thermal and morphological properties of natural fiber reinforced composites.
    - Improved coir fiber composites by innovatively hybridizing with glass fibers, contributing to high-performance material development.
    - Performed life cycle assessment of natural fiber reinforced composites for automotive application.
  - **Other projects**:
    - Developed techniques for extruding long natural fibers and optimizing natural fiber composite processes.
    - Enhanced composite modulus by 25-58% through improved cellulose nanofiber dispersion in PP matrices.
    - Produced modular sandwich panels for energy-efficient building facades using vacuum infusion.
    - Investigated the properties of recycled polymer fiber composites for large-scale additive manufacturing process.
  - **Teaching assistant**: Mechanics of Materials, Computer Aided Engineering/Manufacturing and Life Cycle Analysis/Emboided Energy
    - Mechanics of Materials - Helped in problem solving, grading and proctoring exams.
    - Computer Aided Engineering/Manufacturing - Helped in problem solving, organizing labs, grading and proctoring exams.
    - Life Cycle Analysis/Emboided Energy - Took a lecture session, helped in problem solving.
- **Graduate Research Assistant** — Aug 2018 - Aug 2020
  Department of Biosystems Engineering, Auburn University
  - **Advisor: Dr. Sushil Adhikari, Thesis topic: Production of Bio-Composite Filament using Lignin, Polylactic Acid and High Impact Polystyrene for Additive Manufacturing (3D printing)**:
    - Formulated thermoplastic polymer blends with diverse fillers (e.g., wood flour, lignin) using twin screw extruder.
    - Investigated mechanical, thermal, and morphological properties of lignin-filled PLA composites, achieving a significant 20% (approx.) improvement in strength through additive incorporation.
    - Utilized CAD and slicer software to prepare 3D printing files and optimized printing parameters for efficient and precise manufacturing.
- **Teaching Assistant** — Nov 2017 - Jun 2018
  Department of Mechanical Engineering, Thapathali Campus, Tribhuvan University
  - **Courses- Engineering Drawing I, Engineering Drawing II and AutoCAD**: Taught these courses to undergraduate students.

Professional Skills

- **Laboratory Skills:** Extrusion compression molding, Twin screw compounding, Injection molding, Compression molding, Wet-laid, Carding, VARTM, Hand layup, Prepreg layup, Fused deposition modeling (FDM) printing, Direct ink writing (DIW), Mechanical characterization including tensile, flexural, ILSS and impact testing, DSC, TGA, DMA, FTIR, Melt flow index tester, Rheometer, Pycnometer, SEM, Optical microscopy
- **Software:** SimaPro, AutoCAD, Solidworks, MATLAB, Python, SAS, JMP, ImageJ, Origin

Publications

- **Sanjita Wasti**, Katie Copenhaver, Xianhui Zhao, Umesh Marathe et al. "Hybrid composite materials and their properties" Hybrid Composite Materials and Manufacturing: Fibers, Nano-Fillers and Integrated Additive Processes (2024)
- Umesh Marathe, Georges Chahine, **Sanjita Wasti**, Chase Mccullar et al. "Bridging conventional manufacturing through hybrid manufacturing processes" Hybrid Composite Materials and Manufacturing: Fibers, Nano-Fillers and Integrated Additive Processes (2024)
- **Sanjita Wasti**, Dipti Kamath, Kristina Armstrong, Caitlyn Clarkson et al. "Life cycle assessment of coir fiber reinforced composites for automotive applications" Journal of Cleaner Production (2024)
- **Sanjita Wasti**, Frederic Vautard, Caitlyn Clarkson, Samarthya Bhagia et al. "Effects of Mercerization and Fiber Sizing of Coir Fiber for Utilization in Polypropylene Composites" Cellulose (2024)
- **Sanjita Wasti**, Amber M Hubbard, Caitlyn M Clarkson, Eric Johnston et al. "Long coir and glass fiber reinforced polypropylene hybrid composites prepared via wet-laid technique" Composites Part C: Open Access (2024)
- Xianhui Zhao, Samarthya Bhagia, Diego Gomez-Maldonado, Xiaomin Tang, **Sanjita Wasti** et al. "Bioinspired design toward nanocellulose-based materials" Materials Today (2023)
- Matthew Korey, Mitchell L Rencheck, Halil Tekinalp, **Sanjita Wasti** et al. "Recycling polymer composite granulate/regrind using big area additive manufacturing" Composites Part B: Engineering (2023)
- Uday Vaidya, **Sanjita Wasti**, Halil Tekinalp, Ahmed Arabi Hassen, Soydan Ozcan "Recycled Glass Polypropylene Composites from Transportation Manufacturing Waste" Journal of Composites Science (2023)
- **Sanjita Wasti**, Benjamin Schwartz, Pritesh Yeole, Georges Chahine, et al. "Overmolding Textile Grade Carbon Fiber Tape and Bamboo Fiber Polypropylene Composites" SAMPE Journal (2023)
- Samarthya Bhagia, Surbhi Kore, **Sanjita Wasti**, Jaroslav Ďurkovič et al. "3D printing of a recycled copolyester of terephthalic acid, cyclohexanedimethanol and tetramethylcyclobutanediol" Polymer Testing (2023)
- Shuvodeep De, Breanna James, Jesse Ji, **Sanjita Wasti**, et al. "Biomass-derived composites for various applications" Advances in Bioenergy (2023)
- **Sanjita Wasti**, Surbhi Kore, Pritesh Yeole, Halil Tekinalp, et al. "Bamboo fiber reinforced polypropylene composites for transportation applications" Frontiers in Materials (2022)
- Xianhui Zhao, Oluwafemi Oyedeji, Erin Webb, **Sanjita Wasti** et al. "Impact of biomass ash content on biocomposite properties" Composites Part C: Open Access (2022)
- Ryan Spencer, **Sanjita Wasti**, Seokpum Kim, Merlin Theodore et al. "Volumetric nondestructive evaluation for damage in carbon fiber reinforced polymer panels subjected to artificial lightning strikes" Nondestructive Characterization and Monitoring of Advanced Materials, Aerospace, Civil Infrastructure, and Transportation XVI (2022)
- Xianhui Zhao, Katie Copenhaver, Lu Wang,.., **Sanjita Wasti** et al. "Recycling of natural fiber composites: Challenges and opportunities" Resources, Conservation and Recycling (2022)
- **Sanjita Wasti**, Eldon Triggs, Ramsis Farag, Maria Auad, Sushil Adhikari, et al. "Influence of Plasticizers on Thermal and Mechanical Properties of Biocomposite Filaments Made from Lignin and Polylactic Acid for 3D Printing." Composites Part B: Engineering (2021)
- **Sanjita Wasti** and Sushil Adhikari. "Use of Biomaterials for 3D Printing by Fused Deposition Modeling Technique: A Review." Frontiers in Chemistry (2020)

Patents and Invention Disclosures

- **Sanjita Wasti**, Ganesh Deka, Uday Vaidya "Nickel Coated Substrate Made with Coir and Other Biodegradable Fibers Combined with Low-Cost Carbon Fibers Ideal for Various Shielding Applications" (2022) - Invention Disclosure

Scholarships, Honors and Awards

- **Outstanding Graduate Student in Mechanical Engineering** by Department of Mechanical, Aerospace and Biomedical Engineering, UTK - Apr 2024
- Graduate Student Senate **Award for Excellence in Graduate Research** by UTK - Mar 2024
- Summer **Graduate fellowship** by UTK - Jul 2023
- **Graduate Advancement, Training and Education (GATE) fellowship** by UT-ORII to support collaborative research between UTK and ORNL - Feb 2023
- **Certificate of Achievement for Outstanding Teamwork and Collaborative Efforts** by Composites Science and Technology Section, ORNL - Jan 2023
- Finalist for the **Awards for Composites Excellence (ACE)** competition at CAMX 2022, Anaheim, CA for "Modular Overclad Composite Panels for Envelope Retrofits" - Oct 2022
- **Society of Plastics Engineers (SPE) - ACCE student poster competition** winner - Sep 2022
- **Harold Giles Composites Division Scholarship** by SPE - Jul 2022
- **Jackie Rehkopf Scholarship** by SPE - Jul 2022

- **Outstanding Master's Student for 2020-2021** by Auburn University - Apr 2021
- **Master's Thesis Award for 2020-2021** by Auburn University - Oct 2020
- **Graduate fellowship** by University of Tennessee Knoxville for being top incoming PhD student, to pursue doctoral work from Fall 2020 - May 2020
- **Shree Shanker Lal Agrawal Gold Medal** by Tribhuvan University, Thapathali Campus for being batch topper - Mar 2018
- **Academic Excellence Award** by Tribhuvan University, Thapathali Campus for being batch topper - Mar 2018

Presentation in scientific meetings

Presentations: 12 poster presentations, 5 oral presentations, below listed are selected presentations

- **Sanjita Wasti**, Dipti Kamath, Kristina Armstrong, Caitlyn Clarkson, et al. Life Cycle Assessment of Coir Fiber Reinforced Composites for Automotive Application. SPE ANTEC 2024, St.Louis, Missouri. Poster presentation.
- **Sanjita Wasti**, Amber M. Hubbard, Caitlyn Clarkson, Halil Tekinalp, et al. Hybridized Coir/Glass Fiber Reinforced Polypropylene Composites. SPE ACCE 2023, Novi, Michigan. Oral presentation.
- **Sanjita Wasti**, Amber M. Hubbard, Caitlyn Clarkson, Halil Tekinalp, et al. Hybridized Coir/Glass Fiber Reinforced Polypropylene Composites. SPE ACCE 2023, Novi, Michigan. Poster presentation.
- **Sanjita Wasti**,Benjamin Schwartz, Pritesh Yeole, Georges Chahine, et al. Overmolding Textile Grade Carbon Fiber Tape and Bamboo Fiber Polypropylene Composites. CAMX 2022, Anaheim, California. Oral Presentation.
- **Sanjita Wasti**, Benjamin Schwartz, Pritesh Yeole, Georges Chahine, et al. Fabrication and study of carbon fiber tape overmolded bamboo fiber-polypropylene composites. SAMPE Conference and Exhibition 2022, Charlotte, North Carolina. Poster presentation.
- **Sanjita Wasti**, Surbhi Kore, Pritesh Yeole, Uday Vaidya. Bamboo bio-composites trailer decks: from concept to final part. SPE ACCE 2022, Novi, Michigan. Poster presentation.
- **Sanjita Wasti**, Maria Auad, Eldon Triggs, Dilpreet Bajwa,et al. Bio-composite filaments using lignin for 3D printing. Thermal and Catalytic Sciences (TCS) Symposium 2020, Online, Oral presentation
- **Sanjita Wasti**, Maria Auad, Eldon Triggs, Dilpreet Bajwa,et al. Polylactic acid and lignin filaments for 3D printing. American Society of Agricultural and Biological Engineers (ASABE) Annual International Meeting 2020, Online, Oral presentation
- **Sanjita Wasti**, Maria Auad, Eldon Triggs, Dilpreet Bajwa,et al. Development of biobased composite filament for 3D printing. S1075 The Science and Engineering for a Biobased Industry and Economy 2019, Golden, Colorado. Poster presentation

Leadership and Teamwork

- Extensively supported IACMI workforce development programs for K-12 and community colleges - 2023
- Mentored America's Cutting Edge (ACE) Composites Training Program, UTK - Jul 2022
- Built three different bridge for SAMPE student bridge competition - May 2022
- External Vice President of Society for the Advancement of Materials and Process Engineering (SAMPE), UTK Chapter - May 2022 - May 2023
- Mentored ACE CNC machining for advanced composites bootcamp program, UTK - Jul 2021
- Internal Vice President of Society for the Advancement of Materials and Process Engineering (SAMPE), UTK Chapter - May 2021 - May 2022
- Research mentor at Fiber and Composites Manufacturing Facility (FCMF) - Mentored 10+ undergraduate researchers since joining of PhD program

Affiliations and Volunteer Involvement

- Reviewer for Composites Part B: Engineering, Biomass Conversion and Biorefinery, Advanced Composites and Hybrid Materials, Industrial Crops and Products and Green Energy and Sustainability journals Jan 2022 - Present
- Society of Plastics Engineers (SPE) Nov 2021 - Present
- Society for the Advancement of Materials and Process Engineering (SAMPE) May 2021 - Present
- American Society of Agricultural and Biological Engineers (ASABE) Jun 2020 - Jun 2021