MANAN MEHTA

mananmehta2510@gmail.com | 217-721-9249 | mananm2.github.io | LinkedIn | Google Scholar

EDUCATION

University of Illinois Urbana-Champaign — Aug 2020 - Dec 2023 (expected)
Ph.D., Mechanical Engineering — GPA: **3.9/4.0**
Graduate Minor, Statistics

Ph.D. Thesis: Data-Efficient Machine Learning for Decision Making in Smart Manufacturing

Birla Institute of Technology and Science, Pilani — Aug 2015 - May 2019
B.E. (Hons.), Mechanical Engineering — GPA: **9.7/10.0**

WORK EXPERIENCE

University of Illinois Urbana-Champaign — Aug 2020 - Present
Graduate Research Assistant, Advisor: Prof. Chenhui Shao — *Champaign, IL*

- Research focused on applying advanced machine learning methods in smart manufacturing and industrial IoT
- Demonstrated the first applications of federated learning in additive manufacturing and machine fault diagnosis
- Formulated a novel clustering algorithm to tackle on-device statistical heterogeneity in federated learning
- Developed an end-to-end response surface methodology for multi-task learning with input-dependent noise
- Formulated a novel framework to combine active learning and multi-task learning for Gaussian processes
- Enabled highly data-efficient, flexible, and accurate modeling in crucial manufacturing applications like defect detection from images, fault diagnosis from sensor signals, part qualification after 3D printing, and surface shape prediction

Seagate Technology — May 2023 - Present
AI/Machine Learning Intern — *Shakopee, MN (Remote)*

- Working closely with a global team of data scientists in the Global Wafer Systems organization
- Building models to improve precision and recall of wafer classification systems to be deployed in production

Lam Research — May 2020 - Aug 2020
Intern — *Portland, OR (Remote)*

- Formulated and programmed a physics-informed system-level heat transfer solver
- Performed statistical analysis of machine age data to draw useful inferences for remaining useful life prediction
- Automated the detection of Fluorine deposition depth from images to reduce manual testing from 20 min to 10 sec

TECHNICAL SKILLS

Python (numpy, pandas, scipy, matplotlib, scikit-learn, PyTorch, TensorFlow), R, C++, SQL, MATLAB, Git

PUBLICATIONS

1. Manan Mehta, Yuhang Yang, and Chenhui Shao, (2023), "Multi-task learning with multi-resolution data in manufacturing," in preparation.
2. Manan Mehta, Miles V. Bimrose, William P. King, and Chenhui Shao, (2023), "Federated learning enables privacy-preserving and data-efficient geometry prediction and part qualification across additive factories," in preparation.
3. Manan Mehta, Siyuan Chen, Haichuan Tang, and Chenhui Shao, (2023), "A federated learning approach to mixed fault diagnosis in rotating machinery," *Journal of Manufacturing Systems*, accepted.
4. Manan Mehta and Chenhui Shao, (2023), "A greedy agglomerative framework for clustered federated learning," *IEEE Transactions on Industrial Informatics*, in press, doi: 10.1109/TII.2023.3252599. [pdf] [news]
5. Manan Mehta and Chenhui Shao, (2022), "Federated learning-based semantic segmentation for pixel-wise defect detection in additive manufacturing," *Journal of Manufacturing Systems*, Vol. 64, pp. 197–210. [pdf] [code] [news]
6. Manan Mehta and Chenhui Shao, (2021), "Adaptive sampling design for multi-task learning of Gaussian processes in manufacturing," *Journal of Manufacturing Systems*, Vol. 61, pp. 326–337.

HONORS AND AWARDS

1. NSF Travel Award for the 51st North American Manufacturing Research Conference — 2023
2. Swati and Mukul Chawla Scholarship for graduate studies, UIUC — 2022
3. K. C. Mahindra Fellowship for graduate studies — 2019
4. Rank 3/120 in Mechanical Engineering, BITS Pilani — 2019

5. Institute Merit Scholarship, BITS Pilani 2019
6. DAAD-WISE Scholarship for summer research exchange in Germany 2018
7. Dhirubhai Ambani Scholarship for excellence in mathematics 2016

INVITED PRESENTATIONS

1. "Addressing data heterogeneity in collaborative fault diagnosis using clustered federated learning," INFORMS Annual Meeting, Phoenix, AZ, Oct. 2023.
2. "Federated learning in manufacturing and beyond: opportunities and challenges," AI Institute for Food Systems, UC Davis, Sep. 2022.
3. "An introduction to Gaussian process regression and filtered kriging for surface interpolation," nanoHUB, Purdue University, July 2022.
4. "Active learning for multi-task learning of Gaussian processes," UIUC–Cyprus Institute Joint Talk Series, Oct. 2021.

SERVICE

Peer Review

Served as a reviewer for

- IEEE Transactions on Industrial Informatics
- Journal of Manufacturing Systems
- 51st North American Manufacturing Research Conference (NAMRC 51)

Teaching

- Teaching assistant at UIUC for Calculus II (2 semesters) and Computer-aided Design (2 semesters)
- Led teaching sessions and laboratory discussions for 60-90 students
- Included in the 'List of Teachers Ranked as Excellent' by the Center for Innovation in Teaching and Learning

SELECTED COURSEWORK

Computer Science :	Machine Learning, Deep Learning, Computer Vision, Data Science and Analytics, Big Data Foundations, Data Structures and Algorithms
Mathematics/Statistics :	Advanced Regression Analysis, Statistical Learning, Random Processes, Optimization, Mathematical Statistics, Probability Theory