

# Prayag Anil Gore

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## EDUCATION

### **Doctor of Philosophy in Mechanical Engineering (Ph.D.)**

**Intended Dec 2025**

Micro and Nano Manufacturing Laboratory, University of Cincinnati, Cincinnati, OH, USA

**GPA: 3.813**

- **Thesis:** Machine Learning for Performance Enhancement in Electrochemical Machining via Predictive Diagnostics

### **Master of Science in Mechanical Engineering (MS)**

**Dec 2022**

Center for Intelligent Maintenance Systems, University of Cincinnati, Cincinnati, OH, USA (IMS Center)

**GPA: 3.803**

- **Thesis:** PHM Methodology for Location-based Health Evaluation and Fault Classification of Linear Motion Systems\

## TECHNICAL SKILLS

**Data Analysis & Visualization:** Python (Pandas, TensorFlow, Scikit-learn, NumPy), R, MATLAB, SQL, Git, Tableau

**Machine Learning:** Deep Learning, SVM, SOM, Random Forest, Signal Processing, Time Series, Image Processing

## WORK EXPERIENCE

### **P&G Digital Accelerator**

*Jan 2021 - Present*

#### *Machine Learning Engineer and Systems Engineer*

- **Designed and implemented Image Data Augmentation framework** for training deep learning models for quality control of feminine hygiene products increasing dataset from 10K → 100K images without losing classification accuracy.
- **Developed Systems Engineering models** of complex manufacturing systems via interviews of subject matter experts.
- **Accurately mapped the consumer needs to manufacturing processes** and raw materials by analyzing their impacts on final product quality, using model-based systems engineering (MBSE).

### **Micro and Nano Manufacturing Laboratory**

*Aug 2023 – Present*

#### *Graduate Research Assistant*

- **Developed Image processing technique** using “adaptive background modeling” to detect and map spark discharges. Spark detection capability was enhanced by 150% when compared with supervised deep learning methodology
- **Extracted gas film dynamics via edge detection** on high-speed camera data; applied Gaussian Process Regression (GPR) to model relationships between input parameters and output characteristics.
- **Developed data acquisition system** to monitor electrolyte behavior and statistically quantify performance degradation.

### **Intelligent Maintenance Systems**

*Aug 2020 – Dec 2022*

#### *Graduate Research Assistant*

- **Developed a transfer learning methodology** for detection of health degradation and fault classification tasks using data from non-connected ball screw systems, with deep learning techniques.
- **Designed a fault classification approach** for PCB manufacturing with highly imbalanced datasets, leveraging feature engineering and gradient boosting algorithms (**PHM Europe Data Challenge 2022 - won 2<sup>nd</sup> place**)
- **Authored and published research papers** on machine learning applications for ball screw health evaluation, fault classification, and PCB manufacturing.

### **SAE India – Team Pegasus Racing**

**Aug 2016 – December 2018**

#### *Design and Manufacturing Team for Steering*

- **Developed an Ackerman steering system** for formula-3 race car for **SAE India’s Supra racing** competition.
- **Designed steering quick release mechanism** for maneuverability and safety testing

## PUBLICATIONS [\[Google Scholar Profile\]](#)

1. **Gore, P.**, Chen, Y.-J., & Sundaram, M. (2024). Unsupervised detection and mapping of sparks in the Electrochemical Discharge Machining (ECDM) process. *Manufacturing Letters*, 41, 435–441. [\[Link\]](#)
2. Kundu, P., Miller, M., **Gore, P.**, Jia, X., & Lee, J. (2023). Detection of inception of preload loss and remaining life prediction for ball screw considering change in dynamics due to worktable position. *Mechanical Systems and Signal Processing*, 189, 110075. [\[Link\]](#)
3. **Gore, P.**, John Taco, Minami, T., Kundu, P., & Lee, J. (2022). A Novel Methodology for Health Assessment in Printed Circuit Boards. *PHM Society European Conference*, 7(1), 556–562. [\[Link\]](#)
4. Lee, J., **Gore, P.**, Jia, X., Siahpour, S., Kundu, P., & Sun, K. (2022). Stream-of-quality methodology for industrial internet-based manufacturing system. *Manufacturing Letters*, 34, 58–61. [\[Link\]](#)