



DATA SCIENCE INTERN

SUMMER 2025, ON-SITE, CINCINNATI, OHIO

JOB RESPONSIBILITIES

1. Machine Learning for Simulation Optimization:

- Apply advanced machine learning techniques to enhance FEA simulations and other engineering models.
- Develop algorithms to optimize simulation processes, improving accuracy, computational efficiency, and predictive capabilities of simulation results (e.g., structural, thermal, fluid dynamics).
- Implement machine learning models that identify key insights, correlations, and anomalies in large engineering datasets.

2. Finite Element Analysis (FEA) and Simulation Support:

- Support the execution and refinement of FEA simulations to analyze material behavior, structural performance, and system responses under different scenarios.
- Evaluate FEA results and work with engineering teams to integrate machine learning insights to enhance model predictions.
- Conduct sensitivity analyses to determine the effect of various parameters on simulation accuracy and performance.

3. Model Development and Validation:

- Develop machine learning models to predict material behaviors, structural failures, and optimize mechanical system performance.
- Validate machine learning models with real-world data and refine them to improve prediction accuracy in simulations.
- Develop hybrid simulation and machine learning approaches that reduce the need for excessive computational resources while improving model outcomes.

4. Simulation Tool Development and Enhancement:

- Assist in the development of custom tools or software solutions to integrate machine learning workflows with FEA and simulation platforms.
- Collaborate with engineers to develop simulation tools and automate the analysis of results, enabling more efficient workflows.

5. Documentation and Reporting:

- Document methodologies, machine learning models, and validation results clearly and comprehensively.
- Prepare detailed technical reports and presentations to communicate findings, simulation insights, and recommendations to senior engineers and stakeholders.

6. Compliance and Best Practices:

- Ensure adherence to best practices in data science, simulation modeling, and coding.
- Follow industry standards and regulations related to FEA, simulation, and machine learning.

QUALIFICATIONS

- Currently pursuing or recently completed a Master's or PhD in Data Science, Mechanical Engineering, Applied Mathematics, or a related field.
- Strong understanding of machine learning algorithms and techniques, with a focus on regression models, deep learning, and optimization techniques.
- Proficiency in Python for data analysis, machine learning model development, and simulation data processing (familiarity with libraries such as scikit-learn, TensorFlow, PyTorch).
- Experience with FEA software tools (e.g., ANSYS, Abaqus, COMSOL) and an understanding of simulation concepts such as meshing, boundary conditions, and convergence criteria.
- Background in mechanical engineering principles, especially in material properties, structural behavior, and system performance.
- Advanced data analysis, statistical modeling, and computational skills, with a focus on applying these to real-world engineering problems.
- Strong problem-solving, analytical, and critical thinking skills, with the ability to translate complex simulation data into actionable insights.
- Excellent communication skills, with the ability to present complex technical findings to both technical and non-technical stakeholders.
- Experience with data visualization tools (e.g., Matplotlib, Seaborn, Paraview) and knowledge of high-performance computing methods is a plus.

HANDS-ON EXPERIENCE WITH STATE-OF-THE-ART ADDITIVE MANUFACTURING TECHNOLOGY.

EXPOSURE TO MECHANICAL TESTING METHODOLOGIES AND INSTRUMENTATION.

MENTORSHIP FROM EXPERIENCED ENGINEERS AND PROFESSIONALS IN THE FIELD.

NETWORKING OPPORTUNITIES WITHIN THE INDUSTRY AND POTENTIAL FOR CAREER ADVANCEMENT.