

Job Title: Research Assistant Professor – AI/ML for Materials Design and Advanced Manufacturing

Location: Department of Aerospace and Mechanical Engineering, The University of Texas at El Paso (UTEP)

Position Type: Full-Time, Non-Tenure Track

Position Overview:

The University of Texas at El Paso (UTEP) seeks an exceptional candidate for a full-time Research Assistant Professor (RAP) in the transformative field of Artificial Intelligence (AI) and Machine Learning (ML) for Materials Design and Advanced Manufacturing. Housed in the Department of Aerospace and Mechanical Engineering (AME), and in collaboration with the Aerospace Center (AC), Keck Center for 3D Innovation, and Department of Industrial, Manufacturing, and Systems Engineering (IMSE), this position is a cornerstone of UTEP's Regents' Research Excellence initiative.

The successful candidate will spearhead interdisciplinary research efforts that integrate AI/ML tools with materials science and manufacturing, aiming to revolutionize how materials are discovered, processed, and deployed in real-world aerospace, energy, and industrial environments.

Key Responsibilities:

- Conduct cutting-edge research in AI/ML-driven materials science and manufacturing.
- Develop high-impact, collaborative research proposals for federal agencies (e.g., NSF, DoD, DOE, NASA) to secure competitive external funding and support a self-sustaining research program.
- Lead and contribute to interdisciplinary projects in areas such as smart material manufacturing and materials for extreme environments.
- Generate original research ideas and lead innovative projects that result in multiple high-impact publications annually.
- Integrate AI/ML expertise into ongoing materials and manufacturing research to enhance the overall quality, innovation, and impact of the research outcomes.
- Mentor doctoral students and engaged undergraduate researchers in interdisciplinary research and promote workforce development.
- Build collaborations across UTEP's academic and research units, including AME, IMSE, AC, and the Keck Center.

Research Focus Areas:

This position is intended to bridge the gap between data-driven insights and experimental validation in materials science and advanced manufacturing. The selected candidate will leverage AI/ML methodologies to accelerate discovery, design, and optimization across the following research categories:

AI/ML-Guided Materials Design and Discovery:

- Utilize generative models to predict novel materials with targeted mechanical, thermal, and functional properties.
- Integrate multi-physics simulations with ML algorithms for rapid property prediction.
- Use deep learning and surrogate modeling for structure-property-performance mapping.

Advanced Manufacturing and Process Optimization

- Apply reinforcement learning and optimization algorithms to tune parameters in additive manufacturing (AM) processes and incorporate real-time sensor data into feedback systems for closed-loop process control.
- Leverage AI to enable self-adjusting, adaptive manufacturing processes.

Research Domains for AI/ML Integration

Aerospace Materials and Structures

Development of lightweight, high-performance materials designed for extreme aerospace conditions such as hypersonic flight and space environments.

Multifunctional Materials

Design and optimization of materials with integrated capabilities such as self-sensing, energy storage, and self-healing.

Bioinspired Materials

Exploration of biologically inspired material systems using AI/ML tools to replicate and enhance nature-inspired functionalities.

Space Manufacturing

Advancement of material systems and additive manufacturing techniques for in-situ resource utilization (ISRU) and off-Earth manufacturing.

High-Performance Materials for Harsh Environments

Research and development of advanced ceramics, metal-matrix composites, and polymers engineered for extreme temperatures, pressures, radiation, and corrosive conditions.

Minimum Qualifications:

- Ph.D. in Mechanical Engineering, Materials Science, Computer Science, or a closely related field.
- Demonstrated expertise in AI/ML methods applied to materials science or manufacturing.
- Proven publication record in peer-reviewed journals and/or competitive conference proceedings.
- Strong commitment to collaborative, interdisciplinary research and mentoring.

Preferred Qualifications:

- Experience with additive manufacturing and materials characterization.
- Proficiency in AI/ML tools such as TensorFlow, PyTorch, Scikit-learn, or similar.
- Familiarity with computational materials science and/or high-throughput simulations.
- Prior experience in securing research funding or participating in funded projects.

Application Instructions:

- To apply, please submit the following materials to Dr. Yirong Lin (ylin3@utep.edu):
- Cover letter describing your research interests and fit for the position
- Curriculum Vitae (CV)
- Research Statement (2–3 pages)
- Contact information for at least three professional references

The review of applications will begin immediately and continue until the position is filled.