Xiuyuan Zheng

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Guiyang, Guizhou, China

Education

University of Science and Technology of China — Aug. 2022 – Present
B.E. in Theoretical and Applied Mechanics | Minor in Computer Science

Research Experience

Adaptive Mesh Generation for Complex Tire Structures — Oct. 2024 – Present

USTC Youth League Committee "Academic Practice Capability Enhancement Fund"

- Developed a C++ program implementing the advancing front method to automatically generate high-quality finite element meshes from complex tire geometries.
- Engineered algorithms for local feature extraction to identify high-stress regions, enabling adaptive mesh refinement and improving simulation accuracy.

Neural Network-Enhanced Adaptive Mesh Optimization for Digital Tire Simulation — Apr. 2025 – Present

National-level Project, College Students' Innovation and Entrepreneurship Training Program

- Exploring the integration of Neural Networks (PyTorch) to predict optimal mesh density distributions, aiming to automate and optimize the pre-processing pipeline.
- Leveraging Python and scientific computing libraries to bridge mesh generation with FEA posterior error.

Awards & Honors

- Outstanding Student Scholarship, Silver Award (Top 10%) 2025
- First Prize, Anhui Provincial College Students Mechanics Competition 2025
- Second Prize, "Challenge Cup · Huaan Securities" Anhui Provincial Extracurricular Academic Works Competition 2025
- Second Prize, National College Students "Mechanics X" Innovation Practice Symposium 2025
- Second Prize, National College Students Mathematics Competition 2025
- Honorable Mention, National Zhou Peiyuan College Students Mechanics Competition 2025
- Third Prize, 19th "Challenge Cup" National College Students Extracurricular Academic Works Competition 2025
- Second Prize, Chinese Undergraduate Physics Tournament (CUPT), USTC Campus 2024
- Cyrus Tang Moral Education Scholarship 2024, 2025

Technical Skills

- Programming: C++, Python (Proficient: PyTorch, TensorFlow; Experienced: NumPy, SciPy), MATLAB
- Software & Tools: ABAQUS, COMSOL, SolidWorks, CAD
- Technical Areas: Finite Element Analysis (FEA), Adaptive Mesh Generation, Machine Learning, Scientific Computing

Research Outputs

- Developed 5 proprietary codes for adaptive mesh generation and FEA pre-processing, with secured software copyrights.