





Shaharyar Ahmad

 **Home :** 81377, Munich, Germany
 **Email:** shaharyar.20@gmail.com  **Phone:** (+49) 15236780707
 **LinkedIn:** www.linkedin.com/in/shaharyar-ahmad-computational

Gender: Male **Date of birth:** 1 Feb 2000 **Nationality:** Pakistani

ABOUT ME

Master's student in Computational Mechanics at the Technical University of Munich (TUM) with a focus on the Finite Element Method, scientific programming, numerical fluid mechanics, and aerodynamics. Dedicated and motivated to develop innovative solutions for complex engineering problems.

EDUCATION AND TRAINING

[Oct 2023 – Current] **MS Computational Mechanics**

Technical University of Munich

City: Munich | **Country:** Germany |

[2017 – 2021] **B.Sc. Mechanical Engineering**

University of Engineering and Technology Taxila

City: Taxila | **Country:** Pakistan | | **Final grade:** 3.71 (Honours Degree)

WORK EXPERIENCE

[Mar 2024 – Aug 2024] **Research Assistant**

Chair of Computational Modelling and Simulation

City: Munich | **Country:** Germany

- Development of a nonlinear finite element method (FEM) solver in Python for the thermomechanical analysis of laser-based additive manufacturing processes.
- Controlled thermal stresses by optimizing laser beam shapes with a gradient-based L-BFGS algorithm.
- Applying object-oriented programming principles to optimize code to improve flexibility, efficiency, and maintainability.

[Jun 2023 – Dec 2023] **Werkstudent**

Airbus SE

City: Hamburg | **Country:** Germany

- Numerical modeling of an aerodynamic early warning sensor for measuring stall using finite element methods in the in-house solver.
- Mapping of surface turbulence profiles on large airfoils with Delaunay triangulation and direct volume rendering.

PROJECTS

Design and Experimental Investigation of Forced and Thermosiphoning Heat Transfer through Nanofluids in Compound Parabolic Collectors (Bachelor Thesis)

A numerical analysis is performed through ANSYS Fluent to determine fluid flow under free and forced convection at a certain temperature gradient. Afterwards, experimentation was done on a lab scale thermosiphoning setup under controlled conditions. Finally the same phenomenon are applied in CPC and analysis is performed under real time conditions. The results showed that using nanofluids greatly enhanced heat transfer, flow rate and efficiency of system. A hybrid mode of operation to reduce work of pump was further proposed.

Study of Wind Turbine Wake Interactions

CFD based analysis of wind turbine far wakes using ANSYS Fluent was done using NACA 64-418. Moving reference frame technique was employed. The far field wake profile along with wind farm operating conditions effects were studied. The results yielded that an increase in Tip Speed Ratio caused a dramatic increase in velocity deficit and turbulence intensity while free stream velocity only effected turbulence directly.

Optimal Control of Thermal Stresses in Laser-Based Additive Manufacturing Processes

Development of a nonlinear finite element method (FEM) solver in Python for the thermomechanical analysis of laser-based additive manufacturing processes. Controlled thermal stresses by optimizing laser beam shapes with a gradient-based L-BFGS algorithm. Applying object-oriented programming principles to optimize code to improve flexibility, efficiency, and maintainability.

CONFERENCES AND SEMINARS

[11 Nov 2021 – 12 Nov 2021]

1st International Conference on Energy, Power and Environment

University of Gujrat, Pakistan

Presented a conference paper on renewable energy technologies as an oral presenter and got the opportunity to interact and share ideas with international field expert professors.

PUBLICATIONS

[2022]

Design and Experimental Investigation of Thermosiphoning Heat Transfer through Nanofluids in Compound Parabolic Collector, Engineering Proceedings Journal

Reference: S. Ahmad, M. Ali, F. Ali, S. Ahmed, D. Ahmad, and O. Iftikhar

Conference paper based upon final year project and focusing primarily on numerical analysis of thermosiphon using ANSYS and Indoor lab scale experimentation.

RESEARCH INTERESTS

Computational Fluid Dynamics | Fluid Structure Interactions | Computer Aided Engineering | Finite Element Methods | Renewable Energy | Fluid Mechanics

DIGITAL SKILLS

My Digital Skills

MATLAB | CFD(Fluent and OpenFOAM) | LaTeX | Microsoft Office | Python | C++ | SolidWorks