YUEJUN SHI

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CORE EXPERTISE

- Computational fluid dynamics
- Aerodynamics & Aeroacoustics
- Noise, vibration, and harshness
- Wind tunnel testing
- Automotive engineering
- Multidisciplinary optimization

TECHNICAL SKILLS

CAD	CATIA, SolidWorks, AutoCAD
CFD	OpenFOAM, ANSYS Fluent, PowerFLOW, Nek5000
Mesh Generators	Pointwise, ANSA, ANSYS ICEM
Flow Visualization	Tecplot, PowerVIZ, ParaView
Programming Languages	MATLAB, C/C++, Python, Shell script, Fortran, CUDA C
Others	Linux, Windows, Microsoft Office Suite

RELEVANT EXPERIENCES

Aeroacoustics Engineer July 2021 - Present
Lucid Motors, Newark, CA, U.S.A.

· Performing aerodynamic, wind noise, HVAC noise, and water management simulations for luxury electric vehicles
· Identifying opportunities for aeroacoustic improvement to achieve world-class quietness
· Supporting innovative aerodynamic design to attain the lowest drag and the longest range in the market
· Carrying out wind tunnel experiments and road tests
· Working interactively and efficiently within a multidisciplinary team environment

Software Engineer Intern January 2021 - June 2021
Dassault Systémes Simulia Corp., Waltham, MA, U.S.A.

· Developed Python and shell scripts to automate the entire CFD workflow
· Verified and validated a multiphase flow code in PowerFLOW via benchmark cases
· Performed LBM simulations for various multiphase flow applications
· Reported to the manager on a daily basis and participating in team meetings

Graduate Research Assistant September 2017 - June 2021
Department of Mechanical and Aerospace Engineering, University of California, Davis, CA, U.S.A.

· Validated an empirical wall pressure spectrum model
· Developed and validated a machine-learning-based wall pressure spectrum model
· Developed a theoretical model to predict airfoil trailing edge noise at the near-field
· Developed an efficient and accurate numerical approach to predict airfoil trailing edge noise using RANS
· Validated the WMLES solver in OpenFOAM and the IDDES model in ANSYS Fluent
· Proposed two novel trailing edge devices for the future's low-noise aircraft and quiet wind turbines
· Performed WMLES and IDDES simulations on a HPC for the new devices to compute their aerodynamic and aeroacoustic performances and investigate the underlying flow physics of noise reduction

Undergraduate Research Assistant November 2016 - June 2017
School of Aeronautics and Astronautics, Shanghai Jiao Tong University, Shanghai, China

· Validated various RANS models in OpenFOAM
· Automated grid generation and simulations using scripts
· Performed RANS simulations for multi-element airfoils using OpenFOAM
· Designed and optimized kinetic mechanisms for high-lift devices using responding surfaces and genetic algorithm
· Computer modeling and structural/dynamic analyses of the optimal kinetic mechanism

Undergraduate Research Assistant June 2015 - June 2017
Department of Aircraft Manufacturing Engineering, Hefei University of Technology, Hefei, China
· Designed and tested a high-lift airfoil using CFD, genetic algorithm, and a low-speed wind tunnel
· Developed a 2-D FVM-based CFD code using the Roe scheme and multi-stage Runge-Kutta method in C++
· Implemented the multigrid method to speed up the code
· Further accelerated the code using GPUs based on the CUDA platform

EDUCATION

Ph.D. in Aerospace Engineering (GPA: 3.85/4.00) September 2017 - June 2021
University of California, Davis, CA, U.S.A.
Dissertation: Multi-fidelity Computational Fluid Dynamics Simulations of Novel Trailing-edge Devices for Airfoil Self-noise Reduction

M.S. in Aerospace Engineering (GPA: 3.85/4.00) September 2017 - June 2019
University of California, Davis, CA, U.S.A.
Thesis: Airfoil Trailing Edge Noise Prediction Using RANS CFD

B.E. in Aircraft Manufacturing Engineering (GPA: 3.75/4.00) September 2013 - June 2017
Hefei University of Technology, Hefei, China
Thesis: Design of a Kinematic Mechanism for Trailing Edge Flaps

SELECTED PUBLICATIONS

Journal Articles

1. **Yuejun Shi**, Wolfgang Kollmann, "Wall-Modeled Large-Eddy Simulation of a Trailing-Edge Serration-Finlet Configuration", *AIP Advances*, Vol. 11, Issue 6, June 2021, pp. 065222
2. **Yuejun Shi**, Wolfgang Kollmann, "Improved Delayed Detached Eddy Simulation of a Porous Wavy Trailing Edge", *Physics of Fluids*, Vol. 33, Issue 5, May 2021, pp. 055128
3. **Yuejun Shi**, Seongkyu Lee, "Numerical Study of 3-D Finlets Using RANS CFD for Trailing Edge Noise Reduction", *International Journal of Aeroacoustics*, 2020, Vol. 19(1-2), pp. 95–118
4. **Yuejun Shi**, Seongkyu Lee, "Airfoil Trailing Edge Noise Reduction Using a Boundary-Layer Bump", *Acta Acustica united with Acustica*, Vol. 105, No. 5, July 2019, pp. 814–826(13)

Conference Proceedings

1. Chenghai Sun, Hiroshi Otomo, **Yuejun Shi**, Takaji Inamuro, Raoyang Zhang, Hudong Chen, "Enhanced Phase-field-based Lattice Boltzmann Models for Engineering Applications", *30th International Conference on Discrete Simulation of Fluid Dynamics, Viterbo Italy*, September 13-17, 2021
2. **Yuejun Shi**, Wolfgang Kollmann, "Aeroacoustic Characteristics of a Wind Turbine Airfoil under Dusty Air Conditions", *27th AIAA/CEAS Aeroacoustics Conference, Virtual Event*, August 2-6, 2021
3. Bing Zhang, **Yuejun Shi**, Hui Xu, Linli Xie, "Viscous Effects on Panel Flutter in Hypersonic Flows", *2021 AIAA SciTech Forum, Virtual Event*, January 11-15 & 19-21, 2021
4. Jiajie Luo, **Yuejun Shi**, Wenbin Song, "Finlet Optimization for Airfoil Trailing Edge Noise Minimization Using ANN", *26th AIAA/CEAS Aeroacoustics Conference, Virtual Event*, June 15-19, 2020
5. **Yuejun Shi**, Wenbin Song, Yang Qi, "A Multidisciplinary Design Framework for Mechanisms of HLDs", *2019 AIAA Aviation Forum and Exposition, Dallas, TX*, June 17-21, 2019