

YUEJUN SHI

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CORE EXPERTISE

- Fluid mechanics
- Computational fluid dynamics
- Turbulence modeling
- Boundary layer theory
- Aerodynamics
- Acoustics and noise control
- Aeroacoustics
- Numerical optimization

TECHNICAL SKILLS

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| CAD | CATIA, SolidWorks, AutoCAD |
| CFD | OpenFOAM, ANSYS Fluent, PowerFLOW, Nek5000 |
| Mesh Generators | Pointwise, 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 wind noise simulations for luxury electric vehicles
- Identifying opportunities for aeroacoustic improvement to achieve world-class quietness
- Carrying out wind tunnel experiments and road tests
- Working interactively and efficiently within a multidisciplinary team environment

Software Intern January 2021 - June 2021
Dassault Systèmes 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*, 2021 (accepted)
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. **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
2. 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
3. Xuyang Ma, **Yuejun Shi**, Wenbin Song, "Aerodynamic and Aeroacoustic Analysis of SCCH Models of Four High-Lift Configurations near Stall Angle of Attack", *26th AIAA/CEAS Aeroacoustics Conference, Virtual Event*, June 15-19, 2020
4. **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