

# YUEJUN SHI

**Mobile:** (+1) 530-574-8816 **✧ Email:** peteryuejunshi@gmail.com **✧ Location:** Newark, CA

## CORE EXPERTISE

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- Computational fluid dynamics
- Aerodynamicss
- Aeroacoustics
- Turbulence modeling
- Scientific computing
- Numerical optimization

## TECHNICAL SKILLS

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

## RELEVANT EXPERIENCES

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**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

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#### 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

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#### 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", *30<sup>th</sup> 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", *27<sup>th</sup> 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", *26<sup>th</sup> 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