MEIHUA ZHANG

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EDUCATION

The University of Kansas, Lawrence, Kansas — expected December 2019
Ph.D. candidate in Aerosapce Engineering, GPA: 4/4

Northwestern Polytechnical University, Xi'an, China — 2015
M.S. with high honors in Aerospace Engineering

Northwestern Polytechnical University, Xi'an, China — 2012
B.S. with high honors in Aerospace Engineering

RESEARCH EXPERIENCE

Research on Immersed-Boundary Method, The University of Kansas — 2016–present
Graduate Research Assistant, Supervisor: Dr. Zhongquan Charlie Zheng

- Developed a high order porous-medium immersed boundary method, which is more stable and efficient.
- Established wall modeled large eddy simulation method and apply it to the porous-medium immersed boundary method.
- Investigated dynamic mode decomposition, proper orthogonal decomposition and spectral proper orthogonal decomposition. Analyzed the jet flow coherent structures by these decomposition techniques.
- Investigated the recurrence network method, and analyzed the nonlinear dynamic of flow structures by this method.
- Investigated the nest mesh and neural network study for flow control of an airfoil.

Icing and Icing Scaling Law, Northwestern Polytechnical University — 2012–2015
Graduate Research Assistant, Supervisor: Dr. Zhenxia Liu

- Established a new method to calculate ice accretion on a rotating cone.
- Developed a numerical method for ice accretion with mixed phase condition on the basis of numerical solver Fluent.

Research on Two-phase Flow in Cavity, Northwestern Polytechnical University — 2011
Research Assistant

- Developed the interaction of oil droplets and air flow by the two-way coupling method, and investigated the effect of oil motion on the air velocity, turbulence kinetic energy and turbulence dissipation.

TEACHING EXPERIENCE

Department of Aerospace Engineering, The University of Kansas
Graduate Teaching Assistant of AE545 Fundamentals of Aerodynamics — Fall 2018

- Developed the honor projects and in-class quizzes.
- Developed all the lab materials and designed three labs for this course.
- Taught classes on review sessions, and mentored students during weekly office hours.

Graduate Teaching Assistant of AE445 Aircraft Aerodynamics and Performance Spring 2017

- Designed and led the lab session for this class.
- Graded students' homework and tests.

JOURNAL PAPERS

J.6 **Meihua Zhang**, Zhongquan C. Zheng, Huixuan Wu, "The recurrence of flow structures in a low Re wake downstream of two cylinders" to be submitted to *Physics of Fluids*.

J.5 **Meihua Zhang**, Zhongquan C. Zheng, Yangliu Liu and Xiaoyu Jiang, "Numerical simulation and neural network study using an upstream cylinder for flow control of an airfoil," to be submitted to *Journal of Fluids Engineering*.

J.4 **Meihua Zhang** and Z. C. Zheng, "High-order immersed-boundary simulation and error analysis for flow around solid objects using a porous-medium model," to be submitted to *Journal of Computational Physics*.

J.3 **Meihua Zhang**, Amy Zheng, Zhongquan C. Zheng and Zhuo Michael Wang, "Multiphase flow experiment and simulation for cells-on-a-chip devices," *Journal of Engineering in Medicine*, 2019, 233(4), 432-443.

J.2 **Meihua Zhang** and Zhongquan C. Zheng, "Relations of POD modes and Lyapunov exponents to the nonlinear dynamic states in flow over oscillating tandem cylinders," *Physics of Fluids*, 2018, 30, 123602.

J.1 Lifen Zhang, Zhenxia Liu and **Meihua Zhang**, "Numerical simulation of ice accretion under mixed-phase conditions," *Journal of Aerospace Engineering*, 2016, 230(13): 2473-2483.

CONFERENCE PAPERS

C.8 **Meihua Zhang**, Zhongquan C. Zheng, Huixuan Wu "The recurrence of flow structures in a low Re wake downstream of two cylinders," submitted to *APS Division of Fluid Dynamics Meeting 2019*.

C.7 **Meihua Zhang**, Zhongquan C. Zheng, "POD Modes and Lyapunov exponents in nonlinear flow," accepted by *AJKFluids*, San Francisco, CA, USA, July 28–August 1, 2019.

C.6 **Meihua Zhang**, Zhongquan C. Zheng, Yangliu Liu and Xiaoyu Jiang, "Numerical simulation and neural network study using an upstream cylinder for flow control of an airfoil,"in *AJKFluids*, San Francisco, CA, USA, July 28–August 1, 2019.

C.5 **Meihua Zhang** and Zhongquan C. Zheng, "Wall modeled large-eddy simulation used with an immersed-boundary method," in *AIAA Fluid Dynamics conference*, Dallas, Texas, USA, June 17–21, 2019.

C.4 **Meihua Zhang** and Zhongquan C. Zheng, "Analysis of wakes downstream of a heaving airfoil by decomposition methods," in *AIAA Fluid Dynamics Conference*, Atlanta, Georgia, USA, June 25–29, 2018.

C.3 **Meihua Zhang** and Zhongquan C. Zheng, "High-order immersed-boundary simulation and error analysis for flow around a porous structure," in *Proceedings of the ASME 2017 International Mechanical Engineering Congress and Exposition*, Tampa, Florida, USA, November 3–9, 2017.

C.2 **Meihua Zhang**, Amy Zheng, Zhongquan C. Zheng and Zhuo Michael Wang, "A multiphase flow simulation for a cells-on-a-chip device," in *Proceedings of the ASME 2016 International Mechanical Engineering Congress anExposition*, Phoenix, AZ, USA, November 11–17, 2016.

C.1 Lifen Zhang, **Meihua Zhang**, Xiaoxue Zhang and Zhenxia Liu, "Modeling of ice accretion on rotating cone in aero-engine," in *52nd AIAA/SAE/ASEE Joint Propulsion Conference*, Salt Lake City, UT, USA, July 25–27, 2016.

PRESENTATIONS

– "POD Modes and Lyapunov exponents in nonlinear flow" at *AJKFluids*, San Francisco, CA, July 30, 2019.

– "Numerical simulation and neural network study using an upstream cylinder for flow control of an airfoil" at *Women in Aerospace Symposium*, Massachusetts Institute of Technology, May 28, 2019.

– "Analysis of wakes downstream of a heaving airfoil by decomposition methods" at *AIAA Fluid Dynamics Conference*, Atlanta, Georgia, June 25, 2018.

– "Applications of decomposition methods" at *Turbulence Summer School*, University of Maryland, June 3, 2018.

SELECTED AWARDS AND HONORS

Amelia Earhart Fellowship (30 female graduate students each year in the world)	2018
GEA Traval Award, The University of Kansas	2018
School of Engineering Scholarship/Fellowship, The University of Kansas	2016
The National Scholarship for graduate student, China	2014
The National Scholarship for undergraduate student, China	2011

SERVICE

Session Chair of "Bluff body systems" in *AJKFluids conference*	2019
Reviewer of ASME Conference papers	2016-2019
Volunteer of "You at KU" international student orientation	2018

MEMBERSHIPS

AIAA and ASME Student Membership	2017–Present
Sigma Gamma Tau Membership	2018–Present

SKILLS

C/C++, MATLAB, ICEM, ANSYS Fluent, AutoCAD, HTML