Xiaowei He

Department of Mechanical Engineering
University of Utah
1495 E 100 S, MEK 1339
Salt Lake City, UT 84112

+1 (801) 581-6623
xiaowei.he@utah.edu
fpc.mech.utah.edu

Research Interests

Flow Control	Flow control principles, actuator development, circulation control, flight test of novel actuation mechanism, and flow control for ocean engineering and manufacturing.
Unsteady Aerodynamics	Pressure measurement in unsteady aerodynamic models and flight control, vortex dynamics in gust encounters, and aerodynamics of formation flights.
Experimental Methods	Gust generation and control, variable-pressure unsteady wind tunnels, unsteady water tunnels, and cyber-physical systems for unsteady aerodynamics.
Bio-inspired Flow Sensing & Control	Partial force sensing and active structural control for aerodynamic loads.

Education

Ph.D. 2021	Mechanical and Aerospace Engineering	*Illinois Institute of Technology*
M.S. 2017	Mechanical and Aerospace Engineering	*Illinois Institute of Technology*
B.E. 2014	Mechanical Engineering	*Jincheng College of Sichuan University*

Academic Appointments

2024 – Present Assistant Professor
Department of Mechanical Engineering
University of Utah, Salt Lake City, Utah

2022 – 2023 Postdoctoral Research Associate
Center for Fluid Mechanics, School of Engineering
Brown University, Providence, Rhode Island
- Advisor: Kenny Breuer.

2015 – 2022 Graduate Research Assistant
Department of Mechanical, Materials, and Aerospace Engineering
Illinois Institute of Technology, Chicago, Illinois
- Advisor: David Williams.

2015, 2019, 2021 Graduate Teaching Assistant
Department of Mechanical, Materials, and Aerospace Engineering
Illinois Institute of Technology, Chicago, Illinois

Academic Service

Reviewer/Referee	*Journal of Fluid Mechanics*, *Experiments in Fluids*, *AIAA Journal*, *Physics of Fluids*, *Theoretical and Computational Fluid Dynamics*, *Journal of Aerospace Engineering*, *International Journal of Aeroacoustics*, *AIAA Aviation Forum*, *AIAA SciTech Forum*
Conference Service	Local organization committee member *APS DFD 2024*

Honors and Awards

2014, 2015 Armour Graduate Award *Illinois Institute of Technology*

2014 Honored Graduate *Jincheng College of Sichuan University*

2011 National Scholarship *Ministry of Education of China*

Publications

Journal Articles

[J5] He, X. and Williams, D. R. (2023). Pressure feedback control of aerodynamic loads on a delta wing in transverse gusts. *AIAA Journal*, 61(4), 1659-1674. doi: 10.2514/1.J062442.

[J4] He, X., Williams, D. R., and Dawson, S. T. (2022). Transverse gust generation in a wind tunnel: a suction-driven approach. *Experiments in Fluids*, 63(8), 125. doi: 10.1007/s00348-022-03484-9.

[J3] Deparday, J., He, X., Eldredge, J. D., Mulleners, K., and Williams, D. R. (2022). Experimental quantification of unsteady leading-edge flow separation. *Journal of Fluid Mechanics*, 941, A60. doi: 10.1017/jfm.2022.319.

[J2] He, X. and Williams, D. R. (2020). Spectral feedback control of turbulent spectra in a wind tunnel. *Experiments in Fluids*, 61(8), 175. doi: 10.1007/s00348-020-03003-8.

[J1] Rennie, R. M., Catron, B., Zubair Feroz, M., Williams, D., and He, X. (2019). Dynamic behavior and gust simulation in an unsteady flow wind tunnel. *AIAA Journal*, 57(4), 1423-1433. doi: 10.2514/1.J057186.

Conference Papers

[C9] He, X. and Williams, D. R. (2022). Aerodynamic loads and surface pressure characteristics on a wing in transverse cross-flow gusts. In *AIAA Scitech 2022 Forum*. AIAA-Paper 2022-0044. doi: 10.2514/6.2022-0044.

[C8] He, X., Asztalos, K. J., Henry, J., Dawson, S. T., and Williams, D. R. (2021). Generating traveling cross-flow gusts in a wind tunnel. In *AIAA Scitech 2021 Forum*. AIAA-Paper 2021-1938. doi: 10.2514/6.2021-1938.

[C7] He, X. and Williams, D. R. (2020). Unsteady aerodynamic loads on an airfoil at high angle of attack in a randomly surging flow. In *AIAA Scitech 2020 Forum*. AIAA-Paper 2020-0557. doi: 10.2514/6.2020-0557.

[C6] He, X. and Williams, D. R. (2020). Unsteady aerodynamic loads on a UAS model during a pitch maneuver with roll. In *AIAA Scitech 2020 Forum*. AIAA-Paper 2020-0822. doi: 10.2514/6.2020-0822.

[C5] He, X., Asztalos, K. J., Williams, D. R., and Buchert, K. (2020). Tailoring wind tunnel gust spectra with feedback control. In *AIAA Scitech 2020 Forum*. AIAA-Paper 2020-1557. doi: 10.2514/6.2020-1557.

[C4] He, X., An, X., Williams, D. R., and Le Provost, M. (2019). Pressure feedback active flow control of unsteady roll moment on a UCAS delta wing. In *AIAA Scitech 2019 Forum*. AIAA-Paper 2019-0883. doi: 10.2514/6.2019-0883.

[C3] He, X., Provost, M. L., An, X., and Williams, D. R. (2019). Unsteady roll moment control using active flow control on a delta wing. In *Active Flow and Combustion Control 2018* (pp. 19-32). Springer, Cham. doi: 10.1007/978-3-319-98177-2_2.

[C2] Le Provost, M., He, X., and Williams, D. R. (2018). Real-time roll and pitching moment identification with distributed surface pressure sensors on a UCAS wing. In *2018 AIAA Aerospace Sciences Meeting*. AIAA-Paper 2018-0326. doi: 10.2514/6.2018-0326.

[C1] He, X., Le Provost, M., and Williams, D. R. (2018). Dynamic active flow control of the roll moment on a generic UCAS wing. In *2018 AIAA Aerospace Sciences Meeting*. AIAA-Paper 2018-0327. doi: 10.2514/6.2018-0327.

Invited Talks

[I4] "Unsteady aerodynamics loads and flow control in gusts", Intelligent and Bio-inspired Mechanics Seminar Series. 17 Oct 2023.

[I3] "Transverse gust generation in a wind tunnel: a suction-driven approach", Experiments in Fluids Seminar Series. 10 Jan 2023.

[I2] "Active flow control on a delta wing and its surface pressure signature", Special session: The physics and control of leading edge vortices on swept wings, AIAA SciTech 2022, San Diego, CA. 7 Jan 2022.

[I1] "Unsteady aerodynamic loads on an airfoil at high angle of attack in a randomly surging flow", Special session: AVT-282: aerodynamic response of rigid wings in gust encounters II, AIAA SciTech 2020, Orlando FL. 7 Jan 2020.