Curriculum Vitae

Mingjun Wei

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Education:

Ph.D.	Theor. and Applied Mechanics	**Univ. of Illinois at Urbana-Champaign**	2004
M.S.	Mechanical Engineering	**Univ. of California, Los Angeles**	2001
M.Engr.	Modern Mechanics	**Univ. of Science and Technology of China**	1998
B.S.	Modern Mechanics	**Univ. of Science and Technology of China**	1996

PhD Thesis:

Jet Noise Control by Adjoint-Based Optimization (2004)
Thesis Advisor: Jonathan B. Freund, University of Illinois at Urbana-Champaign

Research Areas:

Computational Fluid Dynamics; Model Order Reduction; Control and Optimization; Fluid-Structure Interaction; Computational Aeroacoustics

Professional Experience:

2024 – present: Professor (Harold O. and Jane C. Massey Neff Professorship), MNE Dept., Kansas State University

2016 – 2024: Associate Professor (Harold O. and Jane C. Massey Neff Professorship), MNE Dept., Kansas State University

2015 – 2016: Associate Professor (MAE Academy Endowed Professorship), MAE Dept., New Mexico State University

2012 – 2015: Associate Professor, MAE Dept., New Mexico State University

2006 – 2012: Assistant Professor, MAE Dept., New Mexico State University

2006: Invited Researcher, 2nd European Forum on Flow Control, Poitiers, France, April–June, 2006

2005 – 2006: Postdoctoral Research Associate (advisor: Clarence W. Rowley), MAE Dept., Princeton University

Courses Taught:

KSU, ME571, “Fluid Mechanics”, undergraduate junior/senior level

KSU, ME720, “Intermediate Fluid Mechanics”, graduate level

KSU, ME824 (ME820), “ Computational Fluid Dynamics”, graduate level

KSU, ME920, “ Spectral Method and Model Order Reduction”, graduate level

NMSU, ME338, “Fluid Mechanics”, undergraduate junior/senior level

NMSU, AE339, “Aerodynamics I”, undergraduate junior/senior level

NMSU, ME533, “Computational and Theoretical Fluid Mechanics”, graduate level

NMSU, ME534, “Advanced Computational Fluid Dynamics”, graduate level

Graduate Student Advising:

1. Bolun Xu, PhD (2023), *Thesis:“Reduced-order modeling and adjoint-based optimization of flows with fluid-structure interactions”*
2. Daniel Colgan, MS (2023), *Thesis:“Application of adjoint-based optimization in three-dimensional flows interacting with multiple moving bodies”*
3. Sherif Elsayed, PhD (2022, Co-advising with Dr. Mark Casada and Prof. Ronaldo Maghirang), *Thesis: “Numerical Simulations of the Effects of Tarpaulin Billowing on the Phosphine Movement in Bulk-Stored Grain”*
4. Kun Jia, PhD (2021), *Thesis: “Optimization of flexible wings and vorticity transfer in a leading-edge vortex due to spanwise bending”*
5. Elnaz Rezaian, PhD (2020), *Thesis: “On the Stabilization and Enhancement of the Reduced-Order Models for Compressible Flows”*
6. Wei Zhang, PhD (2019), *Thesis: “The Linear Structure of Nonlinear Dynamic Systems via Koopman Decomposition”*
7. Haotian Gao, PhD (2018), *Thesis: “POD-Galerkin Based ROM for Fluid Flow with Moving Boundaries and the Model Adaptation in Parametric Space”*
8. Mehdi Tabandeh, PhD (2016), *Thesis: “Symmetrization in POD-Galerkin ROMs”*
9. Elnaz Rezaianzadeh, MS (2016), *Thesis: “Galerkin ROM Stability Assessment in Flows with Unsteady Shock Deformations”*
10. Min Xu, PhD (2014), *Thesis: “Understanding flapping-wing aerodynamics through adjoint-based approach”*
11. Tao Yang, PhD (2012), Postdoc (2012-2013), *Thesis: “Numerical study of flexible flapping wings”*
12. Bashar R. Qawasmeh, MS (2008), PhD (2012), *Thesis: “Extreme model reduction of shear layers”*
13. Lin Zhou, PhD (2012, Co-advising with Prof. Dejun Sun), *Thesis: “The stability and sound generation of compressible free shear layers”*
14. Jared D. Hooser, MS (2009, Co-advising with Prof. Chunpei Cai), *Thesis: “A high-pressure driven compressible gas flow study inside a two-dimensional uniform microchannel”*
15. Adri Das, PhD student (current)
16. Masum Alam, PhD student (current)
17. Mohammad Hossein Heidarshenas, PhD student (current)

Journal Publications: ($*$: my graduate student)

1. W. Zhang*, and **M. Wei**, "A local and hierarchical Koopman spectral analysis of fluid dynamics", *International Journal for Numerical Methods in Fluids* (accepted, doi: 10.1002/fld.5327), 2024
2. S. Elsayed*, M. E. Casada, R. G. Maghirang, **M. Wei**, and D. E. Maier, "Numerical simulation of phosphine movement in bulk-stored grain", *Journal of the ASABE*, Vol. 66, issue 3, page 747 – 764, 2023
3. B. Xu*, H. Gao*, **M. Wei**, J. Hrynuk, "Global POD-Galerkin ROMs for fluid flows with moving solid structures", *AIAA Journal*, Vol. 60, No.3, page 1400 – 1414, 2022
4. W. Zhang*, and **M. Wei**, "Generalized eigenvalue approach for dynamic mode decomposition", *AIP Advances*, Vol. 11, No. 12, page 125011, 2021
5. K. Jia*, T. Scofield, **M. Wei**, S. Bhattacharya, "Vorticity transfer in a leading-edge vortex due to controlled spanwise bending", *Physical Review Fluids*, Vol. 6, issue 2, page 024703, 2021
6. E. Rezaian*, and **M. Wei**, "A global eigenvalue reassignment method for the stabilization of nonlinear reduced-order models", *International Journal for Numerical Methods in Engineering*, Vol. 122, issue 10, page 2393 – 2416, 2021
7. S. Elsayed*, M. E. Casada, R. G. Maghirang, and **M. Wei**, "Evolution of phosphine from aluminum phosphide pellets", *Transactions of the ASABE*, Vol. 64, issue 2, page 615 – 624, 2021
8. E. Rezaian*, and **M. Wei**, "A hybrid stabilization approach for reduced-order models of compressible flows with shock-vortex interaction", *International Journal for Numerical Methods in Engineering*, Vol. 121, No. 8, pp 1629 – 1646, 2020
9. M. I. Cheikh, J. Chen, and **M. Wei**, "Small-scale energy cascade in homogeneous isotropic turbulence", *Physical Review Fluids*, Vol. 4, page 104610, 2019
10. T. Yang*, **M. Wei**, K. Jia*, J. Chen, "A monolithic algorithm for the flow simulation of flexible flapping wings", *International Journal of Micro Air Vehicles*, Vol. 11, page 1 – 13, 2019
11. M. Xu*, **M. Wei**, C. Li, and H. Dong, "Adjoint-based optimization for thrust performance of three-dimensional pitching-rolling plate", *AIAA Journal*, Vol. 37, No. 9, pp 3716 – 3727, 2019
12. J. Tran, H. Gao*, J. Sirohi, and **M. Wei**, "Reduced-order methodology for prediction of loads generated by a flexible flapping wing", *International Journal of Micro Air Vehicles*, Vol. 10, No. 1, pp. 31– 41, 2018
13. M. Hassanalian, A. Abdelkefi, **M. Wei**, and S. Ziaei-Rad, "A novel methodology for wing sizing of bio-inspired flapping wing micro air vehicles: theory and prototype", *Acta Mechanica*, Vol. 228, Issue 3, pp 1097 – 1113, 2017
14. M. Xu*, and **M. Wei**, "Using adjoint-based optimization to study kinematics and deformation of flapping wings", *Journal of Fluid Mechanics*, Vol. 799, pp. 56–99, 2016
15. M. Xu*, **M. Wei**, T. Yang*, and Y. S. Lee, "An embedded boundary approach for the simulation of a flexible flapping wing at different density ratio", *European Journal of Mechanics - B/Fluids* Vol. 55, pp. 146–156, 2016
16. M. Xu*, **M. Wei**, C. Li, and H. Dong, "Adjoint-based optimization of flapping plates hinged with a trailing-edge flap", *Theoretical and Applied Mechanics Letters*, Vol. 5, pp. 1–4, 2015
17. B. R. Qawasmeh*, and **M. Wei**, "Low-dimensional models for compressible temporally developing shear layers", *Journal of Fluid Mechanics*, Vol. 731, pp. 364–393, 2013

18. L. Zhou*, **M. Wei**, and D. J. Sun, "A simple model for mechanism study of sound generation in mixing layers", *International Journal of Aeroacoustics*, Vol. 11, No. 3–4, pp. 447–458, 2012
19. L. Zhou*, Z. Wan, D. Sun, and **M. Wei**, "The effects of initial perturbation to mixing-layer noise", *Theoretical and Applied Mechanics Letters*, Vol. 2, page 032003, 2012
20. M. Schlegel, B. R. Noack, P. Jordan, A. Dillmann, E. Grschel, W. Schrder, **M. Wei**, J. B. Freund, O. Lehmann, and G. Tadmor, "On least-order flow representations for aerodynamics and aeroacoustics", *Journal of Fluid Mechanics*, Vol. 697, pp. 367–398, 2012
21. **M. Wei**, B. R. Qawasmeh*, M. Barone, B. G. van Bloemen Waanders, and L. Zhou, "Low-dimensional model of spatial shear layers", *Physics of Fluids*, Vol. 24, page 014108, 2012
22. A. V. G. Cavalieri, P. Jordan, Y. Gervais, **M. Wei**, and J. B. Freund, "Intermittent sound generation and its control in a free-shear flow", *Physics of Fluids*, Vol. 22, page 115113, 2010
23. T. Yang*, **M. Wei**, and H. Zhao, "Numerical study of flexible flapping wing propulsion", *AIAA Journal*, Vol. 48, No. 12, pp. 2909–2915, 2010
24. B. N. Shashikanth, A. Sheshmani, S. Kelly, and **M. Wei**, "Hamiltonian structure and dynamics of a neutrally buoyant rigid sphere interacting with thin vortex rings", *Journal of Mathematical Fluid Mechanics*, Vol. 12, pp. 335–353, 2010
25. **M. Wei**, and C. W. Rowley, "Low-dimensional models of a temporally evolving free shear layer", *Journal of Fluid Mechanics*, Vol. 618, pp. 113–134, 2009
26. C. Cai, K. R. Khasawneh, H. Liu, and **M. Wei**, "Collisionless gas flows over a cylindrical or a spherical object", *Journal of Spacecraft and Rockets*, Vol. 46, No. 6, pp. 1124–1131, 2009
27. J. D. Hooser*, **M. Wei**, B. E. Newton, and G. J. A. Chiffoleau, "An approach to understanding flow friction ignition: a computational fluid dynamics (CFD) study on temperature development of high-pressure oxygen flow inside micron-scale seal cracks", *Journal of ASTM International*, Vol. 6, No. 10, pp. 429–449 Nov. 2009
28. A. Samanta, J. B. Freund, **M. Wei**, and S. K. Lele, "Robustness of acoustic analogies for predicting mixing-layer noise", *AIAA Journal*, Vol 44, No. 11, pp. 2780–2786, 2006
29. **M. Wei**, and J. B. Freund, "A noise-controlled free shear flow", *Journal of Fluid Mechanics*, Vol. 546, pp. 123–152, 2006
30. X. Y. Yin, D. J. Sun, **M. J. Wei**, and J. Z. Wu, "Absolute and convective instability character of slender viscous vortices", *Physics of Fluids*, Vol. 12, No. 5, pp. 1062–1072, 2000
31. **M. Wei**, D. Sun, X. Yin, and J. Wu, "Stability analysis on supersonic trailing-line vortex", *Acta Mechanica Sinica*, Vol. 31, No. 6, pp. 694–699, 1999

Peer-Reviewed Conference Papers: ($*$: my graduate student)

1. B. Xu*, D. Colgan*, **M. Wei**, and J. Hrynuk, "Adjoint-based optimization on the hydrodynamic performance of flexible swimmers", *AIAA* paper 2024-0058, AIAA Scitech 2024, Orlando, FL, 2024
2. B. Xu*, D. Colgan*, **M. Wei**, and J. Hrynuk, "Adjoint-based optimal control on flows with multiple moving cylinders in tandem", *AIAA* paper 2023-0457, AIAA Scitech 2023, National Harbor, MD, 2023

3. D. Colgan*, B. Xu*, **M. Wei**, and J. Hrynuk, "3D vortical structure of multiple moving spheroids under adjoint-based optimal control", *AIAA* paper 2023-0458, AIAA Scitech 2023, National Harbor, MD, 2023
4. B. Xu*, **M. Wei**, and J. Hrynuk, "Optimal force control of the flow past moving cylinders with adjoint-ROM approach", *AIAA* paper 2022-3245, AIAA Aviation 2022 Forum, 2022
5. B. Xu*, **M. Wei**, and J. Hrynuk, "Adjoint-ROM based optimal control of the flow with moving boundaries", *AIAA* paper 2021-2894, AIAA Aviation (virtual), 2021
6. K. Jia*, and **M. Wei**, "Optimization of flexible flapping wings for thrust and efficiency", *AIAA* paper 2021-2570, AIAA Aviation (virtual), 2021
7. B. Xu*, H. Gao*, **M. Wei**, and J. Hrynuk, "POD-Galerkin projection ROM for the flow passing a rotating elliptical airfoil", *AIAA* paper 2020-3082, AIAA Aviation (virtual), 2020
8. E. Rezaian*, and **M. Wei**, "Multi-stage stabilization of ROMs in strongly nonlinear systems", *AIAA* paper 2020-3083, AIAA Aviation (virtual), 2020
9. E. Rezaian*, and **M. Wei**, "Impact of symmetrization on the robustness of POD-Galerkin ROMs for compressible flows", *AIAA* paper 2020-1318, Orlando, FL, 2020
10. W. Zhang*, and **M. Wei**, "Solving generalized eigenvalue problem: an alternative approach for dynamic mode decomposition", *AIAA* paper 2019-1897, San Diego, CA, 2019
11. H. Gao*, **M. Wei**, and K. Jia*, "Model adaptation of an Improved global POD-Galerkin model", *AIAA* paper 2019-1898, San Diego, CA, 2019
12. T. Scofield, K. Jia*, **M. Wei**, and S. Bhattacharya, "Vorticity-transfer in a leading-edge-vortex due to controlled spanwise-bending", *AIAA* paper 2019-2161, San Diego, CA, 2019
13. E. Rezaian*, and **M. Wei**, "Eigenvalue reassignment by particle swarm optimization toward stability and accuracy in nonlinear reduced-order models", *AIAA* paper 2018-3095, Atlanta, GA, 2018
14. H. Gao*, **M. Wei**, and J. Hrynuk, "Data-driven ROM for the prediction of dynamic stall", *AIAA* paper 2018-3094, Atlanta, GA, 2018
15. P. Zhang, P. Wu, Q. Zhang, Z. Shi, **M. Wei**, M. Jaberi-Douraki, "Optimization of feed thickness on distribution of airflow velocity in belt dryer using computational fluid dynamics velocity in belt dryer using computational fluid dynamics", *Energy Procedia*, 142 (2017) 1595–1602, Cardiff, UK, 2017
16. P. Zhang, Y. Mu, Z. Shi, Q. Zhang, **M. Wei**, M. Jaberi-Douraki, "Computational fluid dynamic analysis of airflow in belt dryer: effects of conveyor position on airflow distribution", *Energy Procedia*, 142 (2017) 1367–1374, Cardiff, UK, 2017
17. M. Xu*, T. Yang*, and **M Wei**, "Implementation of Immersed Boundary Method in WENO Scheme to Simulate Shock-Structure Interaction", *FEDSM2017-69217*, ASME 2017 Fluids Engineering Division Summer Meeting, Waikoloa, HI, 2017
18. W. Zhang*, and **M. Wei**, "Model order reduction using DMD modes and adjoint DMD modes", *AIAA* paper 2017-3482, Denver, CO, 2017
19. E. Rezaian*, and **M. Wei**, "Obtaining a stable Galerkin ROM in presence of shock-vortex interactions", *AIAA* paper 2017-1008, Grapevine, TX, 2017

20. H. Gao*, and **M. Wei**, "Domain decomposition in POD-Galerkin projection for flows with moving boundary", *AIAA* paper 2016-1102, San Diego, CA, 2016
21. M. Tabandeh*, **M. Wei**, and J. P. Collins, "On the symmetrization in POD-Galerkin model for linearized compressible flows", *AIAA* paper 2016-1106, San Diego, CA, 2016
22. M. Hassanalian, A. Abdelkefi, **M. Wei**, and S. Ziaei-Rad, "Theoretical analysis and experimental verification for sizing of flapping wing micro air vehicles", *AIAA* paper 2016-1746, San Diego, CA, 2016
23. J. Tran, J. Sirohi, H. Gao*, and **M. Wei**, "Reduced order modeling of loads and deformation of a flexible flapping wing", *AIAA* paper 2015-0177, Kissimmee, FL, 2015
24. M. Xu*, and **M. Wei**, "A continuous adjoint-based approach for the optimization of wing flapping", *AIAA* paper 2014-2048, Atlanta, GA, 2014
25. H. Gao*, and **M. Wei**, "Global model reduction for flows with moving boundary", *AIAA* paper 2014-0222, National Harbor, MD, 2014
26. M. Xu*, and **M. Wei**, "Using adjoint-based approach to study flapping wings", *AIAA* paper 2013-0839, Grapevine, TX, 2013
27. M. Xu*, **M. Wei**, T. Yang*, J. C. Riddick, and A. J. Hall, "Numerical investigation for optimal sensor placement on flapping-wing MAVs", *AIAA* paper 2013-0360, Grapevine, TX, 2013
28. T. Yang*, and **M. Wei**, "A fully-coupled approach to simulate three-dimensional flexible flapping wings", *AIAA* paper 2013-0864, Grapevine, TX, 2013
29. L. Zhou*, Z. Wan, D. Sun, and **M. Wei**, "Sound generation by different vortex interactions in mixing layers", *AIAA* paper 2012-1173, Nashville, TN, 2012
30. M. Xu*, **M. Wei**, T. Yang*, Y. S. Lee, and T. D. Burton, "Nonlinear structural response in flexible flapping wings with different density ratio", *AIAA* paper 2011-376, Orlando, FL, 2011
31. **M. Wei**, and T. Yang*, "A global approach for reduced-order models of flapping flexible wings", *AIAA* paper 2010-5085, Chicago, IL, 2010
32. A. V. G. Cavalieri, P. Jordan, Y. Gervais, **M. Wei**, and J. B. Freund, "Intermittent sound generation in a free-shear flow", *AIAA* paper 2010-3963, Stockholm, 2010
33. T. Yang*, **M. Wei**, and H. Zhao, "Numerical study of flexible flapping wing propulsion", *AIAA* paper 2010-553, Orlando, FL, 2010
34. Z. Liang, H. Dong, H. Wan, P. Beran, and **M. Wei**, Wing-wake interaction and its proper orthogonal decomposition, *AIAA* paper 2010-5084, Chicago, IL, 2010
35. Z. Liang, H. Dong, and **M. Wei**, "Computational analysis of hovering hummingbird flight", *AIAA* paper 2010–555, Orlando, FL, 2010
36. K. Khasawneh, C. Cai, **M. Wei**, and Yang, S., "Rarefied jet plume flows", *AIAA* Paper 2010-0986, Orlando, FL, 2010
37. C. Cai, K. Khasawneh, H. Liu, and **M. Wei**, "Collisionless gas flows over a cylinder and sphere", *AIAA* paper 2009-3603, 41st AIAA Thermophysics Conference, San Antonio, 22-25 June, 2009
38. **M. Wei**, B. R. Qawasmeh*, M. Barone, and B. G. van Bloemen Waanders, "Low-dimensional modeling for spatially developing free shear layers", AIAA paper 2009–363, Orlando, FL, 2009

39. B. N. Shashikanth, A. Sheshmani, S. Kelly, and **M. Wei**, "Hamiltonian structure and dynamics of a neutrally buoyant rigid sphere interacting with thin vortex rings", ITP-07-26, Proceedings of ITP-07, 2007 Interdisciplinary Transport Phenomena V, Bansko, Bulgaria, October, 2007
40. **M. Wei**, and P. Jordan, "An optimally defined sound source in mixing layers", *AIAA* paper 2007-3869, Miami, FL, 2007
41. D. Eschricht, P. Jordan, **M. Wei**, J. Freund, and F. Thiele, "Analysis of noise-controlled shear-layers", *AIAA* paper 2007-3660, Rome, Italy, 2007
42. S. Ahuja, C. W. Rowley, I. G. Kevrekidis, **M. Wei**, T. Colonius, and G. Tadmor, "Low-dimensional models for control of leading-edge vortices: equilibria and linearized models", *AIAA* paper 2007-709, Reno, NV, 2007
43. **M. Wei**, and C. W. Rowley, "Low-dimensional models of a temporally evolving free shear layer", *AIAA* paper 2006-3228, San Francisco, CA, 2006
44. J. Freund, A. Samanta, **M. Wei**, and S. Lele, "The robustness of acoustic analogies", *AIAA* paper 2005-2940, Monterey, CA, 2005
45. J. B. Freund, and **M. Wei**, "Some small changes that make a mixing layer very quiet", *AIAA* paper 2005-0997, Reno, NV, 2005
46. J. B. Freund, and **M. Wei**, "An emperical 'lower bound' on free-shear-flow noise", *XXI ICTAM*, Warsaw, Poland, 2004
47. J. B. Freund, and **M. Wei**, "Adjoint-based control of free shear flow noise", *AIAA* paper 2003-3570, Orlando, FL, 2003
48. **M. Wei**, and J. B. Freund, "Noise control using adjoint-based optimization", *AIAA* paper 2002-2524, Breckenridge, CO, 2002
49. **M. Wei**, and J. B. Freund, "Optimal control of free shear flow noise", *AIAA* paper 2002-0665, Reno, NV, 2002
50. X. Y. Yin, D. J. Sun, **M. J. Wei**, and J. Z. Wu, "Absolute/convective instability of incompressible and compressible swirling vortex", *AIAA* paper 99-0140, Reno, NV, 1999

Other Conference Presentations:

1. K. Ho, J. Ding, **M. Wei**, and S. Fan, "Monodispersed water-in-oil emulsion generation in electric field", *the 77th APS-DFD annual meeting*, Salt Lake City, UT, 2024
2. J. Becerra, K. Ho, N. Snowden, J. Hale, J. Ding, **M. Wei**, and S. Fan, "Biomimetic locomotion study of floating microswimmers with light-driven particle hinges on water/air interface", *the 77th APS-DFD annual meeting*, Salt Lake City, UT, 2024
3. K. Ho, J. Ding, P. Talebibarmi, B. Xu, S. Fan, and **M. Wei**, "Experimental and numerical study of untethered microswimmers with light-driven particle hinges", *the 76th APS-DFD annual meeting*, Washington, DC, 2023
4. B. Xu, **M. Wei**, and J. Hrynuk, "Gust mitigation of a plunging-pitching airfoil by an adjoint-based approach", *the 75th APS-DFD annual meeting*, Indianapolis, IN, 2022
5. D. Colgan, B. Xu, **M. Wei**, and J. Hrynuk, "Hydrodynamic interactions between mother and calf whales under optimized positioning and motion", *the 75th APS-DFD annual meeting*, Indianapolis, IN, 2022

6. **M. Wei**, B. Xu, D. Colgan, and J. Hrynuk, "An adjoint-based approach to study the hydrodynamic schooling of heaving-pitching swimmers", *the 75th APS-DFD annual meeting*, Indianapolis, IN, 2022
7. S. Elsayed, M.E. Casada, R.G. Maghirang, and **M. Wei**, "On Modeling Phosphine Distribution in Bunkers: A new approach for investigating the resistance to airflow of wheat using CFD simulations", *2022 AIM - ASABE Conference*, TX, July 2022.
8. B. Xu, **M. Wei**, and J. Hrynuk, "Using ROMs and adjoint-ROMs to optimize the flow past pitching-plunging wings", *the 74th APS-DFD annual meeting*, Phoenix, AZ, 2021
9. E. Rezaian, and **M. Wei**, "Symmetrization and Non-intrusive Stabilization of ROMs for Compressible Flows", in mini-symposium "Reduced Order Model Stabilizations and Closures" (invited), *SIAM* Conference CSE21 (virtual), March, 2021
10. B. Xu, **M. Wei**, and J. Hrynuk, "Using ROM and adjoint-ROM for an optimal control", *the 73rd APS-DFD annual meeting* (virtual), 2020
11. **M. Wei**, B. Xu, H. Gao, and J. Hrynuk, "A Simple POD-Galerkin Model Based on Computational of Experimental Data of Flows with Moving Boundaries", *the 72nd APS-DFD annual meeting*, Seattle, WA, 2019
12. E. Rezaian, and **M. Wei**, "On the Robustness of POD-Galerkin ROMs with Symmetrizable Governing Equations", *the 71st APS-DFD annual meeting*, Atlanta, GA, 2018
13. **M. Wei**, "Different Base Functions and Other Concerns about ROM" (oral only) for invited session "Modal Analysis of Fluid Flows", AIAA Aviation 2018, Atlanta, GA, 2018
14. H. Gao, and **M. Wei**, "Model Adaptation in Parametric Space for POD-Galerkin Models", *the 70th APS-DFD annual meeting*, Denver, CO, 2017
15. E. Rezaian, and **M. Wei**, "Stabilization Approaches for Linear and Nonlinear Reduced Order Models", *the 70th APS-DFD annual meeting*, Denver, CO, 2017
16. K. Jia, **M. Wei**, M. Xu, C. Li, and H. Dong, "An Adjoint-Based Approach to Study a Flexible Flapping Wing in Pitching-Rolling Motion", *the 70th APS-DFD annual meeting*, Denver, CO, 2017
17. **M. Wei**, "Exploring Nature's Flying Mechanism in a Dual Space" (invited special session: Research Frontiers in Bio-Inspired Propulsion I), *AIAA Aviation 2017*, Denver, CO, 2017
18. H. Gao, and **M. Wei**, "Model order reduction for fluid dynamics with moving solid boundary", *the 69th APS-DFD annual meeting*, Portland, OR, 2016
19. W. Zhang, and **M. Wei**, "A low-order Galerkin model based on DMD and adjoint-DMD modes", *the 69th APS-DFD annual meeting*, Portland, OR, 2016
20. **M. Wei**, and M. Xu, "Adjoint-based optimization for the understanding of the aerodynamics of a flapping plate", *the 68th APS-DFD annual meeting*, Boston, MA, 2015
21. **M. Wei**, M. Xu, and H. Dong, "Using adjoint-based optimization to study wing flexibility in flapping flight", *the 67th APS-DFD annual meeting*, San Francisco, CA, 2014
22. M. Xu, T. Yang, and **M. Wei**, "Implementation of immersed boundary method in WENO scheme to simulate blast-structure interaction", *the 67th APS-DFD annual meeting*, San Francisco, CA, 2014

23. H. Gao, and **M. Wei**, "Global model reduction for the aerodynamics of coupled fluid-structure systems", *the 67th APS-DFD annual meeting*, San Francisco, CA, 2014
24. M. Xu, and **M. Wei**, "Using adjoint-based approach to understand flapping-wing aerodynamics", *the 66th APS-DFD annual meeting*, Pittsburgh, PA, 2013
25. H. Gao, and **M. Wei**, "Model order reduction for the coupled system of flow and moving structure", *the 66th APS-DFD annual meeting*, Pittsburgh, PA, 2013
26. **M. Wei**, and M. Xu, "An adjoint-based approach for the understanding of flapping wings", in mini-symposium "Stochastic Analysis, Control and Computation of Fluid Dynamics and other Physical Phenomena" (invited), *SIAM* Annual Meeting, San Diego, CA, July, 2013
27. **M. Wei**, M. Xu, and T. Yang, "Global model reduction for fluid-structure system", *the 65th APS-DFD annual meeting*, San Diego, CA, 2012
28. M. Xu, and **M. Wei**, "Adjoint-based optimization for flapping wings", *the 65th APS-DFD annual meeting*, San Diego, CA, 2012
29. T. Yang, and **M. Wei**, "Effects of wing flexibility on aerodynamic performance in hovering flight", *the 65th APS-DFD annual meeting*, San Diego, CA, 2012
30. **M. Wei**, "A computational framework for adjoint-based study of flapping wings", *the 64th APS-DFD annual meeting*, Baltimore, MD, 2011
31. T. Yang, L. Martin-Alarcon, **M. Wei**, and F. Shu, "Numerical simulation of a plunging flexible hydrofoil and its experimental validation", *the 64th APS-DFD annual meeting*, Baltimore, MD, 2011
32. L. Martin-Alarcon, T. Yang, F. Shu, and **M. Wei**, "Experimental study of flow field around a plunging flexible hydrofoil", *the 64th APS-DFD annual meeting*, Baltimore, MD, 2011
33. M. Xu, and **M. Wei**, "Fluid-Structure Interaction for Flapping Flexible Wings with Large Mass Ratio", *the 64th APS-DFD annual meeting*, Baltimore, MD, 2011
34. L. Zhou, **M. Wei**, and D. Sun, "A simple sound source for temporally-developing mixing layers", *the 64th APS-DFD annual meeting*, Baltimore, MD, 2011
35. **M. Wei**, "Reduced-order modeling for fully-coupled fluid and structural dynamics of flexible flapping wings", in mini-symposium "Advances in Control of Fluid Dynamics and Challenges facing the US Defense Department's thrust on Unmanned Autonomous Systems" (invited), *SIAM* Conference on Control & Its Applications, Baltimore, MD, July, 2011
36. M. Xu, **M. Wei**, T. Yang, Y. Lee, and T. D. Burton, "Effects of mass ratio to flexible flapping-wing propulsion", *the 63rd APS-DFD annual meeting*, Long Beach, CA, 2010
37. T. Yang, and **M. Wei**, "A fully-coupled approach to simulate three-dimensional flexible flapping wings", *the 63rd APS-DFD annual meeting*, Long Beach, CA, 2010
38. B. R. Qawasmeh, and **M. Wei**, "A least order model for temporally-developing compressible shear layers", *the 63rd APS-DFD annual meeting*, Long Beach, CA, 2010
39. **M. Wei**, and T. Yang, "Global model reduction for fluid-structure interaction in flapping flexible wings", *the 62nd APS-DFD annual meeting*, Minneapolis, MN, 2009
40. B. R. Qawasmeh, and **M. Wei**, "Low-dimensional modeling of shear layers", SIAM conference on Applications of Dynamical Systems, Snowbird, UT, May, 2009

41. **M. Wei**, T. Yang, and H. Zhao, "A strong-coupling approach to simulate flexible flapping wing", *the 61st APS-DFD annual meeting*, San Antonio, TX, 2008
42. B. R. Qawasmeh, and **M. Wei**, "Projection of spatial shear layers in a symmetry-reduced space", *the 61st APS-DFD annual meeting*, San Antonio, TX, 2008
43. **M. Wei**, and C. W. Rowley, "Low-dimensional modeling for both temporally and spatially developing free shear layers", *the 60th APS-DFD annual meeting*, Salt Lake City, Utah, 2007
44. **M. Wei**, and C. W. Rowley, "Low-dimensional models of a temporally evolving free shear layer using template-based methods", *the 59th APS-DFD annual meeting*, Tampa Bay, FL, 2006
45. **M. Wei**, and J. B. Freund, "Jet noise mechanism studied by optimal control", *the 56th APS-DFD annual meeting*, East Rutherford, NJ, 2003
46. **M. Wei**, and J. B. Freund, "Adjoint-based control and analysis of free-shear flow noise", *14th US National Congress of Theoretical and Applied Mechanics*, Blacksburg, VA, 2002
47. **M. Wei**, and J. B. Freund, "Adjoint-based control of noise from two-dimensional mixing layer", *the 54th APS-DFD annual meeting*, San Diego, 2001.

Invited Talks:

1. **M. Wei**, "Adjoint-Based Optimization: from Jet Noise Control to Flapping-Wing Aerodynamics", invited talk at U.S. Army Research Laboratory, Aberdeen, MD, Jul., 2019
2. **M. Wei**, "Short Courses for Reduced-Order Modeling: ROM101 and ROM901", invited short courses at U.S. Army Research Laboratory, Aberdeen, MD, Jul., 2018
3. **M. Wei**, "Different Base Functions and Other Concerns about ROM" (invited special session), AIAA Aviation 2018, Atlanta, GA, Jun., 2018
4. **M. Wei**, "Adjoint-based optimization: from jet noise control to flapping-wing aerodynamics", invited talk at the University of Kansas, Apr., 2018
5. **M. Wei**, "Exploring Nature's Flying Mechanism in a Dual Space" (invited special session), AIAA Aviation 2017, Denver, CO, Jun., 2017
6. **M. Wei**, invited seminar talk in Math Department at NMSU, Oct., 2015
7. **M. Wei**, invited talk at Zhejiang University, June, 2015
8. **M. Wei**, "Model order reduction: from high-fidelity simulation to reduced-order models", invited talk at Iowa State University, Oct. 2014
9. **M. Wei**, "Using adjoint-based method for the understanding and optimization in flexible flapping wings", invited talk at University of Science and Technology of China, May, 2014
10. **M. Wei**, "Using adjoint-based method for the understanding and optimization in flexible flapping wings", invited talk at Shanghai University, May, 2014
11. **M. Wei**, "To understand flapping-wing aerodynamics through adjoint-based optimization", invited talk at University of Minnesota – Twin Cities, Sept., 2013
12. **M. Wei**, "Numerical simulation and optimization of flapping wings", invited talk at Arizona State University, Feb., 2013
13. **M. Wei**, and M. Xu, "An adjoint-based approach for the understanding of flapping wings", mini-symposium (invited), *SIAM* Annual Meeting, San Diego, CA, July, 2013

14. **M. Wei**, "Flexible flapping wings: simulation, optimization, and model reduction", invited talk at University of Texas at Austin, Oct., 2012
15. **M. Wei**, "Global model reduction for fluid-structure systems", invited talk at U.S. Army Research Laboratory, Aberdeen, Aug., 2012
16. **M. Wei**, "Numerical simulation for optimization in flapping-wing MAVs", invited talk at U.S. Army Research Laboratory, Aberdeen, Nov., 2011
17. **M. Wei**, "Simulation and optimization for flexible wings", invited talk at Wright Patterson Air Force Base, AFRL/RB, July, 2011
18. **M. Wei**, "A fully-coupled approach to simulate flapping flexible wings", invited talk at U.S. Army Research Laboratory, Aberdeen, July, 2011
19. **M. Wei**, "Reduced-order modeling for fully-coupled fluid and structural dynamics of flexible flapping wings", mini-symposium (invited), *SIAM* Control and Its Applications, Baltimore, MD, 2011
20. **M. Wei**, "To fly like a bird", invited talk at Mesilla Valley Audubon Society, Las Cruces, NM, Feb., 2011
21. **M. Wei**, "Modeling and control in fluid dynamics and aeroacoustics", invited talk at University of Science and Technology of China, Dec., 2009
22. B. R. Qawasmeh, and **M. Wei**, "Low-dimensional modeling of shear layers", mini-symposium (invited), *SIAM* conference on Applications of Dynamical Systems, Snowbird, UT, May, 2009
23. **M. Wei**, "Low-dimensional modeling for temporally developing free shear layers", invited talk at Computer Science Research Institute (CSRI) of Sandia National Laboratories, Albuquerque, NM, Oct., 2007

Funded Projects (total funding: $4,859,485; MW portion: $2,911,188):

1. "Electrowetting Bursting: Electric Field-Induced Contact Line Instability for Massive and Controllable Droplets Generation" (Co-PI), National Science Foundation (NSF), 2024 – 2027 (total: $455,251; MW:$227,625)
2. "Modeling of Phosphine Fumigations in Shipping Containers for Humanitarian Aid" (PI), United States Department of Agriculture (USDA) ARS, 2024 – 2025 (MW: $48,625)
3. "Improving the Efficacy of Methyl Bromide Alternatives for Stored Grains in Shipping Containers" (Co-PI, KSU-PI), United States Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA), 2023 – 2026 (total: $420,391; KSU: $ 203,856; MW: $119,502)
4. "EAGER: Numerical and Experimental Study of Purcell-Like Locomotion for Microswimmers" (PI), National Science Foundation (NSF), 2023 – 2025 (total: $180,866; MW:$90,433)
5. "Improving Grain Quality, Moisture Shrink, and Energy Use in Covered Grain Piles" (PI), Andersons Research Grant Program, 2023 – 2025 (total: $150,000; MW: $100,000)
6. "Modeling Phosphine Gas Movement in Grain Bunkers" (PI), United States Department of Agriculture (USDA) ARS, 2020 – 2023 (MW: $86,544)
7. "Reduced Order Modeling and Adjoint-Based Optimization on Separated Flows" (PI), Army Research Lab Faculty Fellowship, 2019 (MW: $16,100)

8. "A Collaborative Development of Experimental Separated Flow Data for Reduced Order Modeling (ROM) and Applications of ROM to Jet Fuel Spray Atomization" (PI), Army Research Lab Faculty Fellowship, 2018 (MW: $14,600)
9. "Reduced-Order Model and Shaped Sensor for Flapping-Wing Control" (PI), Army Research Lab (ARL) – Micro Autonomous Systems and Technology (MAST) CTA, 2015 – 2018 (total: $360,000; MW: $214,000)
10. "HPC-Enabled Parametric Studies of Under Body Blasts: From High-Fidelity to Reduced-Order Models" (PI), Army Research Lab (ARL) – Army High Performance Computing Research Center (AHPCRC), 2012 – 2017 (MW: $625,000)
11. "Physics-Based Morphology Analysis and Adjoint Optimization of Flexible Flapping Wings" (Co-PI, NMSU-PI), AFOSR, 2012 – 2016 (total: $320k; MW: $159,837)
12. "Comprehensive Reduced-Order Modeling and Validation for Loads and Flight Stability of a Flapping Wing" (PI), Army Research Lab (ARL) – Micro Autonomous Systems and Technology (MAST) CTA, 2013 – 2015 (total: $570,000; MW: $285,000)
13. "Global Model Order Reduction for Fluid-Structure Interaction" (PI), Graduate Research Enhancement Grant (GREG), NMSU-VPR (internal support), 2013 – 2016 (MW: $44,000)
14. "Acquisition of an Integrated System for Laser-Assisted Non-Intrusive Experimentation and Data-Driven Reduced-Order Modeling" (Co-PI), DoD Research and Education Program for HBCU/MI Equipment/Instrumentation, 2014 – 2015 (total: $493,567; MW: $164,522)
15. "Flapping and Twisting Aeroelastic Wings for Propulsion" (PI), Army Research Lab (ARL) – Army High Performance Computing Research Center (AHPCRC), 2007 – 2012 (total: $759,141; MW: about $400k)
16. "Simulation and Modeling of Flexible Flapping Wings" (PI), AFRL/RB Summer R&D Program, 2011 (MW: $10,400)
17. "Effects to Reduced-Order Modeling of Shear Layers: Boundary Conditions, Compressibility, and External Forcing" (PI), Sandia National Laboratories, 2008 – 2009 (MW: $40,000)
18. "Reduced-Order Modeling of Shear Layers" (PI), Sandia National Laboratories, 2007 – 2008 (MW: $40,000)

Awards and Honors:

Associate Fellow of American Institute of Aeronautics and Astronautics (AIAA)
Harold O. and Jane C. Massey Neff Professorship (KSU), 2016 –
MAE Academy Endowed Professorship (NMSU), 2015 – 2016
NMSU Millionaire Researcher Award, 2014

Professional Membership and Committee:

American Institute of Aeronautics and Astronautics (AIAA) Associate Fellow
American Physical Society (APS) member
American Society of Mechanical Engineers (ASME) member
Society for Industrial and Applied Mathematics (SIAM) member
American Physical Society (APS) DFD Acrivos Award Committee (2017 – 2018)
AIAA Fluid Dynamics Technical Committee member (2013 – 2016)
AIAA Aeroacoustics Technical Committee member (2007 – 2011)

Internal Serivces:

MNE Department, Graduate Program Director, Graduate Committee chair, KSU, 2020 –
K-State Graduate Council, Academic Affairs Committee, KSU, 2024 –
Wildcat Rocketry, faculty advisor, KSU, 2021 –
MNE Staff Search Committee member, KSU, 2024
K-State Graduate Council, Planning Committee, KSU, 2021 – 2023
K-State Graduate Council, Assessment and Review Committee, KSU, 2020
MNE Department Honors and Awards Committee chair, KSU, 2018 – 2020
MNE Department Graduate Committee member, KSU, 2017 – 2018, 2019 – 2020
Frankenhoff Research Committee (College of Engineering), KSU, 2017 – 2020
AIAA K-State Student Chapter, faculty advisor, KSU, 2023 – 2024
MNE Department Head Search Committee member, KSU, 2020
MNE Faculty Search Committee member, KSU, 2017, 2018, 2019
University Research Council (URC) member (NMSU, 2013 – 2016)
MAE Department Graduate Program Director (NMSU, 2013 – 2016)
MAE Graduate Committee member, NMSU, (2008 – 2016), chair (2013 – 2016)
Sigma Gamma Tau faculty advisor, (NMSU, 2013 – 2015)
MAE Department Head Search Committee member (NMSU, 2012)
MAE Faculty Search Committee member (NMSU, 2010, 2014)

Professional Services:

- Editorial service:
  1. *International Journal of Micro Air Vehicles*, Associate Editor, 2018 –
  2. *Drones*, Editorial Board, 2021 –
- Conference organizer and session chairs:
  1. session chair, *the 75th APS-DFD annual meeting*, Indianapolis, IN, 2022
  2. session chair, *AIAA Aviation 2018*, Atlanta, GA, 2018
  3. session chair, *the 70th APS-DFD annual meeting*, Denver, CO, 2017
  4. session chair, *AIAA Aviation 2017*, Denver, CO, 2017
  5. session chair, *AIAA SciTech 2016*, San Diego, CA, 2016
  6. session chair, *the 68th APS-DFD annual meeting*, Boston, MA, 2015
  7. associate organizer, *AIAA SciTech 2015*, Kissimmee, FL, 2015
  8. session chair, *52nd AIAA Aerospace Sciences Meeting*, National Harbor, MD, 2014
  9. session chair, *51st AIAA Aerospace Sciences Meeting*, Grapevine, TX, 2013
  10. session chair, *the 65th APS-DFD annual meeting*, San Diego, CA, 2012
  11. session chair, *49th AIAA Aerospace Sciences Meeting*, Orlando, 2011
  12. session chair, *2011 AIAA Southwest Regional Technology Symposium*, Las Cruces, NM
  13. session chair, *2010 AIAA Southwest Regional Technology Symposium*, Las Cruces, NM
  14. session chair, *2009 AIAA Southwest Regional Technology Symposium*, Las Cruces, NM
  15. session chair, *the 61st APS-DFD annual meeting*, San Antonio, TX, 2008
  16. session chair, *46th AIAA Aerospace Sciences meeting and Exhibit*, Reno, 2008

- Paper referee:
    1. Journal of Fluid Mechanics
    2. Physics of Fluids
    3. Physical Review Fluids
    4. Physical Review Letters
    5. Journal of Computational Physics
    6. Journal of Fluid and Structure
    7. Journal of the Royal Society Interface
    8. Proceedings of The Royal Society A
    9. Computers and Fluids
    10. AIAA Journal
    11. International Journal for Numerical Methods in Engineering
    12. SIAM Journal on Scientific Computing
    13. International Journal of Computational Fluid Dynamics
    14. Journal of Aerospace Engineering
    15. Aeronautical Journal
    16. Aerospace Science and Technology
    17. Chinese Physics Letters
    18. Papers for various academic conferences (*AIAA, ASME*).
- Proposal reviewer:
    1. National Science Foundation (NSF)
    2. Army Research Office (ARO)
    3. Department of Energy (DoE), Office of Science
    4. NASA Florida Space Grant Consortium
    5. Research Grants Council, Hong Kong
    6. Shota Rustaveli National Science Foundation