Haoxiang Luo

Department of Mechanical Engineering
Vanderbilt University
VU Station B 351592
2301 Vanderbilt Place
Nashville, TN 37235-1592
Tel: (615) 322-2079
Fax: (615) 343-6687
Email: haoxiang.luo@vanderbilt.edu
Homepage: http://challenge.vuse.vanderbilt.edu

Education:

- Ph.D., Mechanical Engineering, University of California, San Diego, December 2004
- M.E., Mechanical Engineering, Tsinghua University, Beijing, July 1999
- B.E., Mechanical Engineering, Tsinghua University, Beijing, July 1996

Employment:

- 2018 - present, Associate Chair
  Department of Mechanical Engineering, Vanderbilt University, Nashville, TN
- 2014 - present, Associate Professor of Mechanical Engineering
  Department of Mechanical Engineering, Vanderbilt University, Nashville, TN
- 2014 - present, Associate Professor of Otolaryngology (secondary appointment)
  Department of Otolaryngology, School of Medicine, Vanderbilt University, Nashville, TN
- 2007 - 2014, Assistant Professor of Mechanical Engineering
  Department of Mechanical Engineering, Vanderbilt University, Nashville, TN
- 2013 - 2014, Assistant Professor of Otolaryngology (secondary appointment)
  Department of Otolaryngology, School of Medicine, Vanderbilt University, Nashville, TN
- May - July, 2010, Summer Faculty
  Wright-Patterson Air Force Base / Air Force Research Lab, Dayton, OH
- October 2005 - July 2007, Postdoctoral Research Scientist
  Department of Mechanical and Aerospace Engineering, George Washington University, Washington, DC
- September 2004 - September 2005, Postdoctoral Researcher
  Department of Mechanical and Aerospace Engineering, University of California, San Diego, CA
- September 1999 - August 2004, Graduate Student Researcher
  Department of Mechanical and Aerospace Engineering, University of California, San Diego, CA

Awards and honors:

- The American Institute of Aeronautics and Astronautics (AIAA) Associate Fellow, 2015.
- General H. H. Arnold Award. AIAA Tennessee Section, 2013.
- National Science Foundation Faculty Early Career Development (CAREER) Award, 2010.
- Junior Faculty Teaching Fellowship. Vanderbilt University Center for Teaching, 2010.
- Doctoral New Investigator Award, American Chemical Society Petroleum Research Fund, 2008.
- Dissertation Fellowship, Department of Mechanical and Aerospace Engineering, University of California, San Diego, Spring 2004.

- Fellowship to *the First Summer School: Tools to Simulate Turbulence on Supercomputers*, Helmholtz Institute for Supercomputational Physics, Potsdam, Germany. Summer 2001 (4 weeks).
- Top-level *Gaotian* Scholarship for Graduate Students, Tsinghua University, 1997.
- Top-level Scholarship for Excellent Students, Tsinghua University, 1995.

Professional membership:

- Member of the American Physical Society (APS), Division of Fluid Dynamics (DFD)
- Member of the American Society of Mechanical Engineers (ASME)
- Member (and Associate Fellow) of the American Institute of Aeronautics and Astronautics (AIAA)

Sponsored Research and Grants

Current projects:

1. NIH R01
   Title: Development of a patient-specific surgical planning tool for type 1 laryngoplasty
   Sponsor: National Institute on Deafness and Other Communication Disorders (NIDCD)
   Period: 12/20/2017 - 11/30/2022
   Role: Co-Investigator (and PI for the subaward to Vanderbilt University)
   Budget (my share): $1,150,019

2. VenoStent, Inc (through NSF STTR Phase I)
   Period: 07/01/2018 - 6/30/2019
   Title: Hemodynamic Effects Inform Design of an External Stent to Reduce Dialysis Access Failures Synopsis
   Role: Senior Personnel (Vanderbilt University PI)
   Budget: $70,964 (my share)

3. Title: EPRI/WERF: Collaborative Research: Electrical percolation in flowable electrodes for energy-efficient water re-use applications
   Sponsor: NSF
   Budget: $254,975
   Period: 01/03/2018-01/03/2022
   Role: Co-PI (lead PI: Kelsey Hatzell, Vanderbilt University)

4. Computing Resource Award
   Title: Computational fluid-structure interaction of biological systems
   Sponsor: NSF (XSEDE program)
   Amount: 60,000 node hours on TACC Stampede 2
   Period: 04/01/2018 - 03/31/2019
   Role: PI

5. Research Grant
   Title: Multiscale Modeling of Electrochemical Flow Capacitors for Grid-Scale Energy Storage
   Sponsor: Vanderbilt University (Discovery Grant)
   Period: 07/11/2016 - 06/30/2018
   Total budget: $100,000
   Role: PI

Completed projects:

1. Computing Resource Award
   Title: Computational fluid-structure interaction of biological systems
   Sponsor: NSF (XSEDE program)
   Amount: 361,529 SUs (value: $12,527)
   Period: 07/01/2016 - 06/30/2017
   Role: PI

2. Vanderbilt International Research Grant
   Title: Developing computational methods for modeling biological fluid-structure interaction
   Sponsor: Vanderbilt University
   Period: 09/01/2015 - 08/31/2016
   Total budget: $3,500
   Role: PI

3. Research Grant
   Title: CAREER: flapping in the wind – passive mechanisms in insect wings for flight stabilization
   Sponsor: NSF
   Total budget: $416,500
   Period: 08/15/2010-07/31/2016
   Role: PI

4. Research Grant
   Title: Collaborative research: three-dimensional flow-structure interaction during phonation
   Sponsor: NSF
   Total budget: $333K (my share: $270K)
   Period: 08/15/2011 - 07/31/2015
   Role: Lead PI

5. Research Grant
   Title: Molecular pathophysiology of acute phonotrauma
   Sponsor: NIH/NIDCD (R01 grant)
   Total budget: $1.8M (my share: $150K)
   Period: 12/01/2010 - 11/30/2015
   Role: Co-Investigator (PI: Bernard Rousseau)

6. Research Grant
   Title: A high-fidelity computational tool for the laryngeal dynamics during phonation
   Sponsor: Vanderbilt University (Discovery Grant)
   Period: 5/6/2011 - 6/30/2015
   Total budget: $100,000
   Role: PI

7. Research Grant
   Title: Three-dimensional aerodynamics of flapping wings in forward flight
   Sponsor: Arnold Engineering Development Center
   Contract: 1/1/2015 - 5/31/2015
   Total budget: $7,500
   Role: PI

8. Computing Resource Award
   Title: Computational fluid-structure interaction of biological systems
   Sponsor: NSF (XSEDE system)
   Amount: 697,550 SUs
   Period: 10/1/2012-9/30/2013
   Role: PI

9. Student Award
   Awardee: Casey Brock (1st year graduate student)

Sponsor: The National Defense Industrial Association (NDIA) Tennessee Valley Chapter
Award: The Space and Missile Defense Working Group 2012 Graduate Fellowship
Amount: $5,000
Role: Faculty advisor

10. Research Grant
Doctoral New Investigator (DNI): three-dimensional fragmentation of core-annular flow
Sponsor: American Chemical Society Petroleum Research Fund (ACS/PRF)
Period: 6/1/2009 - 8/31/2011
Total budget: $100,000
Role: PI

11. Research Grant
Title: Novel capsule-patch for immunoprotection of pancreatic islets/beta cells
Sponsor: Juvenile Diabetes Research Foundation
Total budget: $1,155,000 (my share: $27K)
Period: 07/01/09 - 06/30/12
Role: Co-Investigator (PI: Taylor G. Wang)

12. Computing Resource Award
Title: Flow-elastic interaction of flapping wings on Teragrid
Sponsor: NSF (TeraGrid system)
Amount: 500,000 SUs (new allocation)
Period: 4/1/2011-3/31/2012
Role: PI

13. Computing Resource Award
Title: Parallel calculation of flow-elastic interaction in insect flight
Sponsor: NSF (TeraGrid system)
Amount: 50,000 SUs (start-up allocation)
Period: 3/2/2010-3/2/2011
Role: PI

14. Postdoc Fellowship
Awardee: Dr. Paulo J.S.A. Ferreira de Sousa (postdoc in my lab)
Title: Computational flow-structure interaction in biological and biomedical systems
Sponsor: Fundação para a Ciência e a Tecnologia (FCT) of Portugal
Amount: $72,000 for 2 years plus installation and conference travel
Period: 2/1/2009-1/31/2011
Role: Faculty advisor

15. Student Scholarship
Awardee: Fang-Bao Tian (visiting student)
Title: Computational fluid–structure interaction for biological propulsion
Sponsor: The China Scholarship Council
Total amount: $13,200 (plus travel)
Period: 9/1/2009-8/31/2010
Role: Faculty advisor

16. The Air Force Summer Faculty Fellowship Program
Title: Unsteady flow and aerodynamic performance of an elastic pitching/heaving wing with finite aspect ratios
Sponsor: The Air Force Research Lab
Period: 5/17/2010-7/9/2010
Total amount: $13,874 (faculty salary and living cost)
Role: PI

17. Undergraduate Capstone Project
Title: A biomimetic hovering MAV with flexible wings

Sponsor: Air Force Research Lab
Total budget: $3,240
Period: 1/1/2011-6/30/2011
Role: Faculty advisor

18. Undergraduate Capstone Project
Title: An actuation system for biomimetic flapping wings
Sponsor: Air Force Research Lab
Total budget: $3,410
Period: 1/18/2010-4/27/2010
Role: Faculty advisor

19. Supplemental award to STEM Teaching Assistants
Awardee: Bo Yin (graduate student)
Title: Using computer simulations and problem-based learning in teaching fluid dynamics and heat transfer
Sponsor: Vanderbilt University CIRTL
Total budget: $3,000
Period: Fall 2008
Role: Faculty advisor (Co-advisor: Greg Walker)

Travel grants:

1. A $2000 travel grant from the National Committee for Theoretical and Applied Mechanics (USNC/TAM) for the 2012 International Congress of Theoretical and Applied Mechanics (ICTAM) in Beijing, China.
Role: PI

2. A $1000 travel grant from the APS for Fang-Bao Tian (visiting student) to the 2010 APS/DFD annual meeting in Long Beach, CA.
Role: Faculty advisor

3. A $500 travel grant from the APS for Hu Dai (graduate student) to the 2009 APS/DFD annual meeting in Minneapolis, MN.
Role: Faculty advisor

Publications and Scholarship

My advisees are indicated with italic names for graduate students, † for postdocs, and * for undergraduate students.

Peer-reviewed journal articles:

1. Karzar-Jeddi, M.†, **Luo, H.**, and Cummings, P.T. (2018) Mobilities of polydisperse hard spheres near a no-slip wall. Computers & Fluids. 176, 40-50.

2. *Chen, Y.*, **Luo, H.** (2018) A computational study of the three-dimensional fluid-structure interaction of aortic valve. Journal of Fluids and Structures. 80, 332-349.

3. Zeping Xu, Lingyan Jin, Byron Smith, Yiping Bai, **Haoxiang Luo**, Lars Axel Strombergsson, Min Fei, Yandong Jiang, (2018) A novel device for air removal from vascular access line: a bench study. Journal of Clinical Monitoring and Computing. 32(6), 1041-1047.

4. Song, J., Zhong, Y., **Luo, H.**, Ding, Y., Du, R. (2018) Hydrodynamics of larval fish quick turning: a computational study. Journal of Mechanical Engineering Science. 232(14), 25152523.

5. *Zhang, Y.*, Zhou, C., **Luo, H.** (2017) Effect of mass ratio on thrust production of an elastic panel pitching or heaving near resonance. Journal of Fluids and Structures. 74, 385-400.

6. *Song, J.*, Tobalske, B.W., Powers, D.R., Hedrick, T.L., **Luo, H.** (2016) Three-dimensional simulation for fast forward flight of a calliope hummingbird. Royal Society Open Science. 3, 160230.

7. *Zhu, C.*, **Luo, H.**, Li, G.†(2016) A high-order immersed-boundary method for incompressible flows. AIAA Journal. 54(9), 2734-2741.

8. *Novaleski, C.K.*, Kojima, T., *Chang, S.*, **Luo, H.**, Valenzuela, C.V., Rousseau, B. (2016) Non-stimulated rabbit phonation model: Cricothyroid approximation. Laryngoscope. 126(7), 1589-94.

9. *Chang, S.*, *Novaleski, C.K.*, Kojima, T., Mizuta, M., **Luo, H.**, Rousseau, B. (2015) Subject-specific computational modeling of evoked rabbit phonation. Journal of Biomechanical Engineering. 138(1), 011005 (6 pages).

10. *Song, J.*, **Luo, H.**, Hedrick, T.L. (2015) Wing-pitching mechanism of hovering Ruby-throated hummingbirds. *Bioinspiration and Biomimetics*. 10, 016007 (11 pages).

11. *Song, J.*, **Luo, H.**, Hedrick, T.L. (2015) Performance of a quasi-steady model for hovering hummingbirds. *Theoretical & Applied Mechanics Letters*. 5(1), 50-53.

12. *Song, J.*, **Luo, H.**, Hedrick, T.L. (2014) Three-dimensional flow and lift characteristics of a hovering Ruby-throated hummingbird. Journal of the Royal Society Interface. 11(98), 20140541 (12 pages).

13. Tian, F.-B.†, *Dai, H.*, **Luo, H.**, Doyle, J.F., Rousseau, B. (2014) Fluid-structure interaction involving large deformations: 3D simulations and applications to biological systems. Journal of Computational Physics. 258, 451-469.

14. *Chang, S.*, Tian, F.-B.†, **Luo, H.**, Doyle, J.F., Rousseau, B. (2013) The role of finite displacements in vocal fold modeling. Journal of Biomechanical Engineering. 135(11), 111008 (8 pages).

15. *Yin, B.*, **Luo, H.** (2013) Numerical simulation of drops inside an asymmetric microchannel with protrusions. Computers and Fluids, 82, 14-28.

16. *Yin, B.*, **Luo, H.** (2013) Hydrodynamic interaction of oblique sheets in tandem arrangement. Physics of Fluids, 25, 011902 (15 pages).

17. *Dai, H.*, **Luo, H.**, Ferreira de Sousa, P.†, Doyle, J.F. (2012) Thrust performance of a flexible low-aspect-ratio pitching plate. Physics of Fluids, 24, 101903 (9 pages).

18. *Tian, F.-B.*, **Luo, H.**, *Song, J.*, Lu, X.-Y. (2012) Force production and asymmetric deformation of a flexible flapping wing in forward flight. Journal of Fluids and Structures, 36, 149-161.

19. Tian, F.-B.†, Lu, X.-Y., **Luo, H.** (2012) Propulsive performance of a body with a traveling-wave surface. Physical Review E, 86, 016304 (5 pages).

20. *House, D.L.*, **Luo, H.**, *Chang, S.* (2012) Numerical study on dielectrophoretic chaining of two ellipsoidal particles. Journal of Colloid and Interface Science, 374, 141-149.

21. *Dai, H.*, **Luo, H.**, Doyle, J.F. (2012) Dynamic pitching of an elastic rectangular wing in hovering motion. Journal of Fluid Mechanics, 693, 473-499.

22. **Luo, H.**, *Dai, H.*, Ferreira de Sousa, P.†, *Yin, B.* (2012) On numerical oscillation of the direct-forcing immersed-boundary method for moving boundaries. Computers and Fluids, 56, 61-76.

23. *Tian, F.-B.*, Lu, X.-Y., **Luo, H.** (2012) Onset of instability of a flag in uniform flow. Theoretical and Applied Mechanics Letters, 2(2), 022005 (5 pages).

24. *House, D.L.*, **Luo, H.** (2011) Effect of DC dielectrophoresis on the trajectory of a non-conducting colloidal sphere in a bent pore. Electrophoresis, 32(22), 3277-3285.

25. *Tian, F.-B.*, **Luo, H.**, Zhu, L., Lu, X.-Y. (2011) Coupling modes of three filaments in side-by-side arrangement. Physics of Fluids, 23, 111903 (14 pages).

26. *Tian, F.-B.*, **Luo, H.**, Zhu, L., Liao, J.C., Lu, X.-Y. (2011) An efficient immersed boundary-lattice Boltzmann method for the hydrodynamic interaction of elastic filaments. Journal of Computational Physics, 230, 7266-7283.

27. *Yin, B.* & **Luo, H.** (2010) Effect of wing inertia on hovering performance of flexible flapping wings. Physics of Fluids, 22, 111902 (10 pages).

28. *Tian, F.-B.*, **Luo, H.**, Zhu, L., & Lu, X.-Y. (2010) Interaction between a flexible filament and a downstream rigid body. Physical Review E, 82, 026301 (10 pages).

29. *House, D.* & **Luo, H.** (2010) Electrophoretic mobility of a colloidal cylinder between two parallel walls. Engineering Analysis with Boundary Elements, 34, 471-476.

30. Pozrikidis, C. & **Luo, H.** (2010) A note on the buckling of an elastic plate under the influence of simple shear flow. Journal of Applied Mechanics, 77(2), No. 021007 (3 pages).

31. **Luo, H.**, Mittal, R., Bielamowicz, S. (2009) Analysis of flow-structure interaction in the larynx during phonation using an immersed-boundary method. Journal of Acoustic Society of America, 126(2), 816-824.

32. **Luo, H.** & Pozrikidis, C. (2009) Numerical simulation of particle encapsulation due to liquid thread breakup. Computers and Fluids, 38, 564-571.

33. Zheng, X., Bielamowicz, S., **Luo, H.**, Mittal, R. (2009) A computational study of the effect of false vocal folds on glottal flow and vocal fold vibration during phonation. Annals of Biomedical Engineering, 37(3), 625-642.

34. **Luo, H.**, Mittal, R., Zheng, X., Bielamowicz, S., Walsh, R., & Hahn, J. (2008) An immersed-boundary method for flow-structure interaction in biological systems with application to phonation. Journal of Computational Physics, 227, 9303-9332.

35. **Luo, H.**, Blyth, M.G., & Pozrikidis, C. (2008) Two-layer flow in a corrugated channel. Journal of Engineering Mathematics, 60, 127-147.

36. **Luo, H.** & Pozrikidis, C. (2008) Buckling of circular plate resting over an elastic foundation in simple shear flow. Journal of Applied Mechanics, 75(5), 051007 (6 pages).

37. **Luo, H.** & Pozrikidis, C. (2008) Effect of surface slip on Stokes flow past a spherical particle in infinite fluid and near a plane wall Journal of Engineering Mathematics, 62(1), 1-21.

38. **Luo, H.** & Pozrikidis, C. (2007) Buckling of a pre-compressed or pre-stressed membrane. International Journal of Solids and Structures, 44, 8074-8085.

39. **Luo, H.** & Pozrikidis, C. (2007) Interception of two spheres with slip surfaces in linear Stokes flow. Journal of Fluid Mechanics, 581, 129-156.

40. **Luo, H.** & Pozrikidis, C. (2007) Gravity-driven film flow down an inclined wall with three-dimensional corrugations. Acta Mechanica, 188, 209-225.

41. **Luo, H.** & Pozrikidis, C. (2006) Effect of inertia on film flow over oblique and three-dimensional corrugations. Physics of Fluids, 18, 078107 (4 pages).

42. Blyth, M.G., **Luo, H.**, & Pozrikidis, C. (2006) A comparison of interpolation grids over the triangle and the tetrahedron. Journal of Engineering Mathematics, 56(3), 263-272.

43. **Luo, H.** & Pozrikidis, C. (2006) Buckling of a flush mounted plate in simple shear flow. Archive of Applied Mechanics, 76, 549-566.

44. **Luo, H.** & Pozrikidis, C. (2006) Shear-driven and channel flow of a liquid film over a corrugated or indented wall. Journal of Fluid Mechanics, 556, 167-188.

45. **Luo, H.** & Pozrikidis, C. (2006) A Lobatto interpolation grid in the tetrahedron. IMA Journal of Applied Mathematics, 71, 298-313.

46. Blyth, M.G., **Luo, H.** & Pozrikidis, C. (2006) Stability of axisymmetric core-annular flow in the presence of an insoluble surfactant. Journal of Fluid Mechanics, 548, 207-235.

47. **Luo, H.** & Bewley, T.R. (2004) On the contravariant form of the Navier–Stokes equation in time-dependent curvilinear coordinate systems. Journal of Computational Physics, 199 (1), 355-375.

Refereed conference articles:

1. *Zhang, Y.*, Zhou, C. **Luo, H.** Simulation of Fluid-Structure Interaction Using Domain-Free Discretization (DFD) and a Predictor-Corrector Coupling Approach. Proceedings of the 23rd AIAA Computational Fluid Dynamics Conference, AIAA AVIATION Forum. AIAA Paper 2017-3620.

2. *Song, J.*, **Luo, H.**, Tobalske, B.W., Hedrick, T.L. (2016) Three-Dimensional Numerical Simulation of Hummingbird Forward Flight. Proceedings of the 46th AIAA Fluid Dynamics Conference. AIAA Paper 2016-3253.

3. *Song, J.*, **Luo, H.**, Tobalske, B.W., Hedrick, T.L. (2015) Analysis of cruise flight of the calliope hummingbird. Proceedings of the 45th AIAA Fluid Dynamics Conference. AIAA Paper 2015-2629.

4. *Song, J.*, **Luo, H.**, Hedrick, T.L. (2014) Comparison of CFD and quasi-steady analysis of hovering aerodynamics of a Ruby-throated hummingbird. AIAA Paper 2014-2149.

5. *Zhu, C.*, Li, G.†, **Luo, H.** (2014) Developing a high-order immersed-boundary method for simulations of flapping wings. AIAA Paper 2014-2148.

6. *Zhu, C.*, Li, G.†, **Luo, H.** (2014) A high-order immersed-boundary method for complex/moving boundaries. ASME FEDSM 2014-21284.

7. Carson, C.*, *Yin, B.*, **Luo, H.**, (2013) CFD based optimization of a flexible flapping wing. AIAA Paper 2013-2454.

8. *Song, J.*, **Luo, H.**, Hedrick, H.L. (2013) Flow characteristics of a hovering hummingbird. AIAA Paper 2013-3050.

9. Tian, F.-B.†, *Dai, H.*, **Luo, H.**, Doyle, J.F., Rousseau, B. (2013) Computational fluid–structure interaction for biological and biomedical flows. The ASME 2013 Fluids Engineering Division Summer Meeting. FEDSM 2013-16408.

10. Tian, F.-B.†, *Chang, S.*, **Luo, H.**, Rousseau, B. (2013) A 3D numerical simulation of wave propagation on the vocal fold surface. Proceedings of the 10th International AQL Conference and Student Workshops: Advances in Quantitative Laryngology, Voice and Speech Research. **Best Paper Award at the conference.**

11. *Dai, H.*, **Luo, H.**, *Song, J.*, Doyle, J. F. (2013) Effect of the pre-existing camber on fluid–structure interaction of cicada wings. AIAA Paper 2013-0952.

12. **Luo, H.**, *Dai, H.*, Doyle, D.F. (2012) Three-dimensional simulations of fluid and elasticity for flapping wings and fins. Fluids & Elasticity 2012 Conference.

13. **Luo, H.**, *Dai, H.*, Mohd Adam Das, Shahrizan Syawal*, *Song J.*, Doyle, J. F. (2012) Toward high-fidelity modeling of the fluid-structure interaction for insect wings. AIAA Paper 2012-1212.

14. Myers, M.R., **Luo, H.** (2012) A challenge-based unit with a hands-on demonstration for teaching momentum in undergraduate fluid mechanics. AIAA Paper 2012-885.

15. Tardiff, N.*, Mohamad Hamdan, S.*, Bradshaw, B.*, Becker, K.*, Senbore, O.*, Su, C.*, **Luo, H.** (2011) A biomimetic wing-actuation mechanism for micro air vehicles. The Spring International Micro Air Vehicle (IMAV) Conference and Flight Competition. **Best Student Paper Award at the conference.**

16. **Luo, H.**, *Dai, H.*, & Doyle, J.F. (2010) Three-dimensional flow-structure interaction in dragonfly wings. AIAA Paper 2010-556.

17. Doyle, J.F. & **Luo, H.** (2010) Structural dynamics during insect flight. Proceedings of the 10th International Conference on Recent Advances in Structural Dynamics. Southampton University, UK, July 12-14, 2010.

18. **Luo, H.** & Bewley, T.R. (2003) Design, modeling, and optimization of tensegrity compliant surface for reduction of drag induced by the turbulent flow. Smart structures and materials 2003: modeling, signal processing, and control (SPIE proceedings series).

19. **Luo, H.** & Bewley, T.R. (2005) Accurate simulation of near-wall turbulence over a compliant tensegrity fabric. Smart structures and materials 2005: modeling, signal processing, and control (SPIE proceedings series).

Other technical publication:

1. **Luo, H.** (2007) Immersed boundary method. *Encyclopedia of Microfluidics and Nanofluidics* (D. Li, Ed.), Springer.

Conference abstracts, presentations, and posters:

1. **Luo, H.** Computational Fluid-Structure Interaction for Biological and Biomedical Applications. The 2017 Shanks Workshop on Mathematical Aspects of Fluid Dynamics. Department of Mathematics, Vanderbilt University, Nashville, TN. April 8-9, 2017.

2. Karzar-Jeddi, M.†, **Luo, H.** Stokesian Dynamics Simulation of Particle-Laden Flow in Electrochemical Flow Capacitor. The 2017 Shanks Workshop on Mathematical Aspects of Fluid Dynamics. Department of Mathematics, Vanderbilt University, Nashville, TN. April 8-9, 2017.

3. *Zhang, Y.*, Zhou, C. **Luo, H.** Simulation of Fluid-Structure Interaction Using Domain-Free Discretization (DFD) and a Predictor-Corrector Coupling Approach. The AIAA Aviation Forum (Fluid Dynamics Conference). Denver, Colorado. June 5-9, 2017.

4. **Luo, H.**, *Chang, S.*, Rousseau, B. Performance of a reduced-order FSI model for flow-induced vocal fold vibration. The 70th Annual Meeting of the APS Division of Fluid Dynamics. Denver, Colorado. November 19-21, 2017.

5. Karzar-Jeddi, M.†, **Luo, H.**, Cummings, P.T. Modeling of electrochemical flow capacitors using Stokesian dynamics. The 70th Annual Meeting of the APS Division of Fluid Dynamics. Denver, Colorado. November 19-21, 2017.

6. *Zhang, Y.*, Zhou, C. **Luo, H.** The role of resonance in propulsion of an elastic pitching wing with or without inertia. The 69th Annual Meeting of the APS Division of Fluid Dynamics. Portland, Oregon. November 20-22, 2016.

7. **Luo, H.**, *Song, J.*, Tobalske, B. Modes of thrust generation in flying animals. The 69th Annual Meeting of the APS Division of Fluid Dynamics. Portland, Oregon. November 20-22, 2016.

8. *Song, J.*, **Luo, H.**, Tobalske, B.W., Hedrick, T.L. Three-Dimensional Numerical Simulation of Hummingbird Forward Flight. The 46th AIAA Fluid Dynamics Conference. Washington, DC. June 13-17, 2016.

9. *Zhang, Y.*, **Luo, H.**, Zhou, C. Fluid-Structure Interaction Using the Domain Free Discretization (DFD) Method. The Engineering Mechanics Institute Conference 2016 (EMI 2016). Nashville, TN. May 22-25, 2016.

10. *Chen, Y.*, *Chang, S.*, **Luo, H.** Computational 3D Fluid-Structure Interaction Involving Large Deformations. The Engineering Mechanics Institute Conference 2016 (EMI 2016). Nashville, TN. May 22-25, 2016.

11. *Song, J.*, **Luo, H.**, Tobalske, B.W., Hedrick, T.L. Analysis of cruise flight of the calliope hummingbird. The 45th AIAA Fluid Dynamics Conference. Dallas, TX. June 22-26, 2015.

12. *Song, J.*, **Luo, H.**, Tobalske, B.W., Hedrick, T.L. Computational modeling of aerodynamics in the fast forward flight of hummingbirds. The 68th Annual Meeting of the APS Division of Fluid Dynamics. Boston, Massachusetts. November 22-24, 2015.

13. **Luo, H.**, *Chen, Y.*, Sun W. Computational 3D fluid-structure interaction for the aortic valve. The 68th Annual Meeting of the APS Division of Fluid Dynamics. Boston, Massachusetts. November 22-24, 2015.

14. *Song, J.*, **Luo, H.**, Hedrick, T.L. Do hummingbirds use a different mechanism than insects to flip and twist their wings? The 67th Annual Meeting of the APS Division of Fluid Dynamics. San Francisco, CA. November 23-25, 2014.

15. *Chang, S.*, **Luo, H.**, *Novaleski, C.*, Rousseau, B. Combining subject-specific and low-order modeling techniques to study fluid-structure interaction of rabbit phonation. The 67th Annual Meeting of the APS Division of Fluid Dynamics. San Francisco, CA. November 23-25, 2014.

16. *Song, J.*, **Luo, H.**, Hedrick, T.L. Comparison of CFD and quasi-steady analysis of hovering aerodynamics of a Ruby-throated hummingbird. Atlanta, GA. June 16-20, 2014.

17. *Zhu, C.*, Li, G.†, **Luo, H.** Developing a high-order immersed-boundary method for simulations of flapping wings. Atlanta, GA. June 16-20, 2014.

18. *Zhu, C.*, Li, G.†, **Luo, H.** A high-order immersed-boundary method for complex/moving boundaries. ASME 2014 Fluids Engineering Summer Meeting (FEDSM). Chicago, IL. August 3-7, 2014.

19. Siyuan Chang, Haoxiang Luo, James F. Doyle, Carolyn K. Novaleski, Tsuyoshi Kojima, Bernard Rousseau. Computational Modeling of Vocal Fold Vibration Based on Realistic Laryngeal Geometry. The 9th International Conference on Voice Physiology and Biomechanics (ICVPB), Salt Lake City, Utah. April 10-12, 2014.

20. Carolyn K. Novaleski, Tsuyoshi Kojima, Siyuan Chang, Haoxiang Luo, Daniel Colvin, Mark Does, Bernard Rousseau. High-Resolution Microimaging of a Rabbit Larynx: Toward the Development of a Three-Dimensional Computational Model of Phonotrauma. The 9th International Conference on Voice Physiology and Biomechanics (ICVPB), Salt Lake City, Utah. April 10-12, 2014.

21. Novaleski, C. K., Kojima, T., Valenzuela, C. V., Chang, S., Luo, H., Rousseau, B. In vivo suture model to elicit rabbit phonation. The Fall Voice Conference, San Antonio, TX. October 23-25, 2014.

22. **Luo, H.**, *Song, J.*, Hedrick, T.L. Force production of a hovering hummingbird. The 66th Annual Meeting of APS/DFD, November 24-26, 2013. Pittsburgh, PA.

23. Carson, C.*, *Yin, B.*, **Luo, H.**, CFD based optimization of a flexible flapping wing. The 21st AIAA Computational Fluid Dynamics Conference. June 24-27, 2013. San Diego, CA.

24. *Song, J.*, **Luo, H.**, Hedrick, H.L. Flow characteristics of a hovering hummingbird. The 31st AIAA Applied Aerodynamics Conference. June 24-27, 2013. San Diego, CA.

25. Tian, F.-B.†, *Chang, S.*, **Luo, H.**, Rousseau, B. A 3D numerical simulation of wave propagation on the vocal fold surface. The 10th International AQL Conference and Student Workshops: Advances in Quantitative Laryngology, Voice and Speech Research. June 3-4, 2013. University of Cincinnati, OH.

26. Tian, F.-B.†, *Chang, S.*, **Luo, H.**, Rousseau, B. Computational modeling of flow-induced vocal fold vibration. The BSEC 2013 Conference: Collaborative Biomedical Innovations Program. May 21-23, 2013. Oak Ridge, TN.

27. *Dai, H.*, **Luo, H.**, *Song, J.*, Doyle, J. F. Effect of the pre-existing camber on fluid–structure interaction of cicada wings. The 51th AIAA Aerospace Sciences Meeting. Jan. 7-10, 2013. Grapevine, TX.

28. **Luo, H.**, *Dai, H.*, Doyle, D.F. Three-dimensional simulations of fluid and elasticity for flapping wings and fins. Fluids & Elasticity 2012, November 14-16, 2012, La Jolla, CA.

29. Tian, F.-B.†, **Luo, H.**, *Song, J.*, Lu, X.-Y. Aerodynamic cause of the asymmetric wing deformation of insect wings. The 65th Annual Meeting of APS/DFD, November 18-20, 2012. San Diego, CA.

30. *Song, J.*, **Luo, H.**, Hedrick, T.L. Three-dimensional flow around a hovering hummingbird. Poster presentation. The 65th Annual Meeting of APS/DFD, November 18-20, 2012. San Diego, CA.

31. *Chang, S.*, Tian, F.-B.†, **Luo, H.**, Kojima, T., Rousseau, B. Toward an integrated approach for modeling evoked rabbit phonation. The Fall Voice Conference. October 4-7, 2012, NYU School of Medicine.

32. **Luo, H.**, *Dai, H.*, Ferreira de Sousa, P.† Thrust production of a flexible low-aspect-ratio foil. Poster presentation. The 23rd International Congress of Theoretical and Applied Mechanics, ICTAM2012, August 19-24, 2012. Beijing, China.

33. **Luo, H.**, *Dai, H.*, Mohd Adam Das, S.*, *Song J.*, Doyle, J.F. Toward high-fidelity modeling of the fluid-structure interaction for insect wings. The 50th AIAA Aerospace Sciences Meeting. Jan. 9-12, 2012. Nashville, TN.

34. Myers, M.R., **Luo, H.** A challenge-based unit with a hands-on demonstration for teaching momentum in undergraduate fluid mechanics. The 50th AIAA Aerospace Sciences Meeting. Jan. 9-12, 2012. Nashville, TN.

35. Tian, F.-B.†, **Luo, H.**, Lu, X.-Y. Flexibility and inertia of flapping wings in forward flight. The 64th Annual Meeting of APS/DFD, November 20-22, 2011. Baltimore, Maryland.

36. *Dai, H.*, Mohd Adam Das, S.*, **Luo, H.** Observation of the wing deformation and CFD study of cicadas. The 64th Annual Meeting of APS/DFD, November 20-22, 2011. Baltimore, Maryland.

37. *Yin, B.*, **Luo, H.** Energy-harvesting potential of multiple elastic structures in tandem arrangement. The 64th Annual Meeting of APS/DFD, November 20-22, 2011. Baltimore, Maryland.

38. Tardiff, N.*, Mohamad Hamdan, S.*, Bradshaw, B.*, Becker, K.*, Senbore, O.*, Su, C.*, **Luo, H.** A biomimetic wing-actuation mechanism for micro air vehicles. The Spring International Micro Air Vehicle (IMAV) Conference and Flight Competition. May 23-27, 2011. Huntsville, AL.

39. Ferreira de Sousa, P.†, *Dai, H.*, **Luo, H.**, Doyle, J.F. Thrust performance and wake structure of a pitching flexible plate at low aspect ratios. The 63rd APS/DFD Annual Meeting, Nov. 21-23, 2010. Long Beach, California.

40. *Tian, F.-B.*, **Luo, H.**, Zhu, L., Lu, X.-Y. Flapping modes of three filaments placed side by side in a free stream. The 63rd APS/DFD Annual Meeting, Nov. 21-23, 2010. Long Beach, California.

41. **Luo, H.**, *Tian, F.-B.*, Lu, X.-Y. Effect of mass ratio for a flexible flapping wing during forward flight. The 63rd APS/DFD Annual Meeting, Nov. 21-23, 2010. Long Beach, California.

42. *House, D.*, **Luo, H.** Effect channel turn on the trajectory of an electrophoretic particle. The 63rd APS/DFD Annual Meeting, Nov. 21-23, 2010. Long Beach, California.

43. *Yin, B.*, **Luo, H.** Numerical simulation of two-phase flows in complex geometries by combining two different immersed-boundary methods. The 63rd APS/DFD Annual Meeting, Nov. 21-23, 2010. Long Beach, California.

44. **Luo, H.**, *Dai, H.*, Doyle, J.F. Three-dimensional flow-structure interaction in dragonfly wings. The 48th AIAA Aerospace Sciences Meeting, Jan. 4-7, 2010. Orlando, FL.

45. **Luo, H.**, *Dai, H.*, Ferreira de Sousa, P.† A hybrid formulation to suppress the numerical oscillations caused by immersed moving boundaries. The 62nd APS/DFD Annual Meeting, Nov. 22-24, 2009. Minneapolis, MN.

46. Ferreira de Sousa, P.†, **Luo, H.**, Evans, H. The Rufous Hummingbird in hovering flight – full-body 3D immersed boundary simulation. The 62nd APS/DFD Annual Meeting, Nov. 22-24, 2009. Minneapolis, MN.

47. *Dai, H.*, **Luo, H.**, Deng, X. Flapping counter force - a unique flight stabilizing mechanism enabled by flapping wings. The 62nd APS/DFD Annual Meeting, Nov. 22-24, 2009. Minneapolis, MN.

48. **Luo, H.**, *Dai H.* Unsteady flow motions in the supraglottal region during phonation. The 61st APS/DFD Annual Meeting, Nov. 23-25, 2008. San Antonio, TX.

49. **Luo, H.**, Mittal, R. Computational flow-structure interaction on Cartesian grids and its application to phonation. The 45th Society of Engineering Science Annual Technical Meeting, Oct. 12-15, 2008. Urbana-Champaign, IL.

50. Bodony, D., **Luo, H.**, Mittal, R. Prediction of sound from human vocal folds. The 60th APS/DFD Annual Meeting, Nov. 18-20, 2007. Salt Lake City, UT.

51. Zheng, X., Mittal, R., **Luo, H.** High-fidelity modeling of the biophysics of phonation using a coupled IBM-FEM method. The 60th APS/DFD Annual Meeting, Nov. 18-20, 2007. Salt Lake City, UT.

52. **Luo, H.**, Zheng, X., Mittal, R., Bielamowicz, S. Coupled aero-structural dynamics in the human larynx during phonation. The 60th APS/DFD Annual Meeting, Nov. 18-20, 2007. Salt Lake City, UT.

53. Zheng, X., **Luo, H.**, Mittal, R. Computational analysis of glottal aerodynamics and vocal fold vibrations during phonation. The 59th APS/DFD Annual Meeting, Nov. 19-21, 2006. Tampa Bay, FL.

54. **Luo, H.**, Zheng, X., Mittal, R., & Bielamowicz, S. An immersed-boundary method for fluid- structure interaction in the human larynx. The 59th APS/DFD Annual Meeting, Nov. 19-21, 2006. Tampa Bay, FL.

55. Mittal, R., **Luo, H.**, Zheng, X., Dong, H., Bielamowicz, S., Walsh, R., & Hahn, J. Development of a high-fidelity biophysical model of vocal fold vibration and glottal aerodynamics. The 5th International Conference on Voice Physiology and Biomechanics, July 12-14, 2006, Tokyo, Japan.

56. **Luo, H.**, Zheng, X., Mittal, R., Dong, H., Bielamowicz, S., Walsh, R., & Hahn, J. Numerical analysis of the glottal dynamics using an immersed-boundary method. The American Society of Biomechanics Annual Meeting, Sep. 6-9, 2006. Blacksburg, VA.

57. Zheng, X., **Luo, H.**, Mittal, R., Dong, H., Bielamowicz, S., Walsh, R., & Hahn, J. Toward a high fidelity biophysical model of vocal fold vibration and glottal aerodynamics. 2006 Summer Bioengineering Conference, June 21-25, 2006. Amelia Island, FL.

58. **Luo, H.** & Bewley, T.R. Interaction of a turbulent channel flow and a tensegrity fabric. AFOSR Workshop on Feedback Flow Control, July 18-19, 2005. Jackson Hole, WY.

59. **Luo, H.** & Bewley, T.R. Accurate simulation of near-wall turbulence over a compliant tensegrity fabric. Smart structures and materials 2005: modeling, signal processing, and control (SPIE conference), March 7-9, 2005. San Diego, CA.

60. **Luo, H.** & Bewley, T.R. Interaction of a turbulent channel flow with a compliant tensegrity fabric. The 57th APS/DFD Annual Meeting. Nov. 21-23, 2004, Seattle, WA.

61. **Luo, H.** & Bewley, T.R. Design, modeling, and optimization of tensegrity compliant surface for reduction of drag induced by the turbulent flow. Smart structures and materials 2003: modeling, signal processing, and control (SPIE conference). March 3-6, 2003. San Diego, CA.

62. **Luo, H.** & Bewley, T.R. Optimization of compliant surfaces for reduction of turbulence-induced drag. The 56th APS/DFD Annual Meeting. Nov. 23-25, 2003. East Rutherford, NJ.

63. **Luo, H.** & Bewley, T.R. Numerical simulation of the turbulent flow over a tensegrity fabric. The 55th APS/DFD Annual Meeting. Nov. 24-26, 2002. Dallas, TX.

64. **Luo, H.** & Bewley, T.R. On the utility of the global TKE equation for turbulence control. The 54th APS/DFD Annual Meeting. Nov. 18-20, 2001. San Diego, CA.

Invited talks:

1. Computational fluid-structure interaction for biological and biomedical applications. Department of Mechanical Engineering, University of Michigan, October 19, 2018.

2. Computational fluid-structure interaction for biological applications. The 2018 Shanks Workshop on Mathematical Aspects of Fluid Dynamics. Department of Mathematics, Vanderbilt University. March 24, 2018.

3. Computational fluid-structure interaction for biological and biomedical applications. Department of Modern Mechanics, University of Science and Technology of China. May 25, 2018.

4. Aerodynamics and aeroelasticity of flapping wings. Department of Aerospace Engineering, Iowa State University. April 14, 2017.

5. Dissecting hummingbird flight: aerodynamics and biomechanics. Department of Mechanical Engineering, University of Louisville. October 7, 2016.

6. Recent lessons from the wings of nature. Department of Mechanical and Automation Engineering, Chinese University of Hong Kong, Hong Kong, China. April 29, 2016.

7. Recent lessons from the wings of nature. Department of Aerodynamics, Nanjing University of Aeronautics and Astronautics, Nanjing, China. April 27, 2016.
8. Recent lessons from the wings of nature. Department of Aircraft, Beijing University of Aeronautics and Astronautics, Beijing, China. April 26, 2016.
9. Recent lessons from the wings of nature. Beijing Computational Science Research Center, Beijing, China. April 25, 2016.
10. Computational modeling of wings in nature. AIAA Tennessee Section. University of Tennessee Space Institute, Tullahoma, TN. Nov. 14, 2013.
11. Computational modeling of vocal fold vibration for basic and clinical applications in laryngology. ViSE Seminar (with B. Rousseau). Vanderbilt University, Nashville, TN. May 30, 2013.
12. Computational modeling of glottal aerodynamics and vocal fold vibration. Vanderbilt University Institute of Imaging Science (VUIIS), Nashville, TN. October 12, 2012.
13. Fluid-structure interaction of insect wings. Department of Engineering Mechanics, Tsinghua University, Beijing, China. May 28, 2012.
14. Fluid–structure interaction in insect flight. The Annual Meeting of the State Key Laboratory of Nonlinear Mechanics (LNM), Institute of Mechanics, Chinese Academy of Sciences, Beijing. December 18, 2012.
15. Immersed boundary methods for biological and biomedical flows. University of Tennessee, Knoxville. Knoxville, TN. April 15, 2010.
16. Flow-structure interaction using the immersed boundary method for MAV applications. WPAFB/AFRL, Dayton, OH. July 8, 2010.
17. Immersed-boundary methods for biological and biomedical flows. Department of Biomedical Engineering, Vanderbilt University, Nashville, TN. Oct. 20, 2008.
18. Computational fluid dynamics based tools for phonosurgery planning. University of Tennessee Space Institute. Tullahoma, TN. Oct. 17, 2007.
19. Modeling and simulation of the flow/structure interaction during phonation. University of Iowa. Iowa City, IO. March 21, 2007.
20. Modeling and simulation of the flow/structure interaction during phonation. Mechanical Engineering Department, Vanderbilt University. Nashville, TN. March 19, 2007.
21. Computational fluid dynamics (CFD) based tools for planning phonosurgery. GWU Symposium on High-Performance Computing and Applications, George Washington University. Washington, DC. Oct. 18, 2006.
22. From compliant coatings to vocal fold vibration: dealing with complex moving boundaries in fluid-structure interaction. Mechanical and Aerospace Engineering Department Seminar, George Washington University. Washington, DC. Feb. 9, 2006.
23. Interaction of near-wall turbulence with compliant tensegrity fabrics: modeling, simulation, and optimization. Center for Turbulence Research, Stanford University. Stanford, CA. Nov. 5, 2004.

Teaching and Advising

Courses taught at Vanderbilt University:

- ME 3224 (formerly ME 224) Fluid Mechanics, 2008 to present.
- ME 4263 (formerly ME 263) Computational Fluid Dynamics and Multiphysics Modeling, 2012 to present.
- ME 5263 (formerly ME 263) Computational Fluid Dynamics and Multiphysics Modeling, 2012 to present.

- ME 263 Intermediate Fluid Mechanics, 2008 to 2011.
- ME 392 Special Topics: Advanced Fluid Dynamics, 2011, 2013.
- ME 391 Special Topics: Introduction to Computational Fluid Dynamics, 2007.

Courses taught at elsewhere:

- MAE 126, Fluid Mechanics, George Washington University, Fall 2006.

Current and past graduate students:

- Yi Song (PhD student, degree expected in 2022)
  Dissertation: TBD
- Ye Chen (PhD student, degree expected in 2019)
  Dissertation: Computational fluid-structure interaction of soft tissues
- Yingkun Li (Visiting PhD student, 2017-2017)
  Title of project: Shock wave induced panel vibration and boundary layer interaction
- Siyuan Chang (PhD, 2016; Postdoc at Vanderbilt University)
  Dissertation: Computational fluid-structure interaction for vocal fold modeling
- Jialei Song (PhD, 2016; Postdoc at Chinese University of Hong Kong)
  Dissertation: Computational modeling of unsteady aerodynamics in hummingbird flight
- Joshua E. Webb (MS, 2016; Engineer at AEDC)
  Thesis: Unsteady aerodynamics of pitching and perching wings
- Yang Zhang (Visiting PhD student, 2015-2016)
  Title of project: Simulation of complex fluid-structure interaction problems by immersed-boundary methods
- Chi Zhu (MS, 2014; PhD student at Johns Hopkins University)
  Thesis: A high-order immersed-boundary method for simulations of incompressible flows
- Bo Yin (PhD, 2013; Engineer at Shanghai Electric, America)
  Dissertation: Interaction of fluids and thin structures: simulations and applications
- Hu Dai (PhD, 2013; Engineer at Pegasus Vertex, Inc.)
  Dissertation: Computational modeling of fluid–structure interaction in biological flying and swimming
- Ryan C. Russell (MS, 2013, co-advised with Tom Withrow)
  Thesis: Computer Finite Element Simulation in Mechanical Design
- Dustin House (PhD, 2012; Engineer at Abbot Diagnostics)
  Dissertation: Applications of the boundary-element method for electrokinetics in microfluidics
- Fang-Bao Tian (Visiting PhD student, 2009-2010)
  Title of project: Theoretical and numerical studies on biomechanics in animal flight and swimming
- Brandon Travis (MS, 2008, co-advised with D. Li; Engineer at Smith Seckman Reid, Inc.)
  Thesis: Fundamental understanding of electroosmotic flow in a heterogeneous converging-diverging circular microchannel

Postdoc advising:

- Dr. Mehdi Karzar-Jeddi, 2016 - 2018
- Dr. Fang-Bao Tian, 2011 - 2013
- Dr. Guibo Li, 2011 - 2012
- Dr. Paulo J.S.A. Ferreira de Sousa, 2009 - 2011

Advisory committees served for PhD and MS students:

- Todd Evans, Ph.D. in 2018, Mechanical Engineering (Advisor: Al Strauss)
  Dissertation: The Application of Friction Stir Welding Processes to New Materials and New Material Combinations
- Stephen Jimenez, Ph.D. in 2018, Civil Engineering (Advisor: Ravindra Duddu)
  Dissertation: Damage Mechanics Approaches for Sharp and Diffuse Fracture Propagation: Application to Ice Sheet Fracture and Composite Delamination
- Timothy Boire, Ph.D. in 2017, Biomedical Engineering
  Dissertation: Development of a Synthetic External Stent to Prevent Vein Graft and Hemodialysis Access Site Failures
- Lijie Yang, Ph.D. in 2017, Mechanical Engineering (Advisor: Deyu Li)
  Dissertation: Investigation of Cell Mechanotransduction and Electrical Activity
- Shuhai Zhang, Ph.D. in 2017, Civil Engineering (Advisor: Caglar Oskay)
  Dissertation: Variational Multiscale Enrichment Method for Modeling of Structures Subject to Extreme Environments
- Xiang Zhang, Ph.D. in 2017, Civil Engineering (Advisor: Caglar Oskay)
  Dissertation: Multiscale Modeling of High Performance Alloys at Elevated Temperatures
- Erin C. DeCarlo, Ph.D. in 2017, Civil Engineering (Advisor: Sankaran Mahadevan)
  Dissertation: Uncertainty Quantification and Confidence Assessment in Time-Dependent, Multidisciplinary Simulations
- Darren Tinker, M.S. in 2016 (Advisor: Bob Pitz)
  Thesis: Partially Premixed Tubular Flames: an Experimental Survey
- Kirsten Heikkinen Dodson, Ph.D. in 2016, Mechanical Engineering (Advisor: Deyu Li)
  Dissertation: Microfluidic Platforms for Chemical and Electrical Signaling in Whole Retina Tissue
- Carl Hall, Ph.D. in 2016, Mechanical Engineering (Advisor: Bob Pitz)
  Dissertation: Instability of premixed lean hydrogen laminar tubular flames
- Carolyn Novaleski (Ph.D. academic advisory committee), 2015, Otolaryngology (Advisor: Bernard Rousseau)
- Michael J. Bogdanor, Ph.D. in 2015, Civil Engineering (Advisor: Caglar Oskay)
  Dissertation: Failure Prediction of Fiber Reinforced Composites Using Reduced Order Multiscale Models
- Paul Sparks, Ph.D. in 2015, Civil Engineering (Advisor: Caglar Oskay)
  Dissertation: Reduced order homogenization models for failure of heterogeneous materials
- Todd Lagus, Ph.D. in 2014, Mechanical Engineering (Advisor: Jon Edd)
  Dissertation: Self-ordering Dynamics in Controlled Encapsulation of Single and Multiple Cells
- Tong Hui, Ph.D. in 2014, Civil Engineering (Advisor: Caglar Oskay)
  Dissertation: Multiscale modeling of the dynamic response of composite structures
- Marc C. Ramsey, Ph.D. in 2013, Mechanical Engineering (Advisor: Bob Pitz)
  Dissertation: Energetic Cavitation Collapse
- Robert D. Crouch, Ph.D. in 2012, Civil Engineering (Advisor: Caglar Oskay)
  Dissertation: Multiscale Modeling of Brittle Composites Using Reduced Order Computational Homogenization
- Yangdong Gao, Ph.D. in 2011, Mechanical Engineering (Advisor: Deyu Li)
  Dissertation: Microfluidic platforms for cell culture and microenvironment control
- Barbaros Cetin, Ph.D. in 2009, Mechanical Engineering (Advisor: Dongqing Li)
  Dissertation: Microfluidic Continuous Separation of Particles and Cells by using AC-Dielectrophoresis

- Saumitra K. Vajandar, Ph.D. in 2009, Interdisciplinary Materials Science (Advisor: Deyu Li)
  Dissertation: Electro-osmotic Pumping and Ionic Conductance Measurements in Porous Membranes
- Mike Myers (Ph.D. academic advisory committee), 2009
- Qingfeng Huang (University of Delaware, Ph.D. advisory committee), 2009
- Zheng Hu (University of Delaware, Ph.D. advisory committee), 2009
- Liang Zhao (University of Delaware, Ph.D. advisory committee), 2009
- Dustin House, M.S. in 2008, Mechanical Engineering (Advisor: Dongqing Li)
  Thesis: Design and experimental validation of a miniature real-time polymerase chain reaction device using disposable microfluidic chips

Undergraduate student research advising:

- Gabriel Rios, undergraduate research project, Spring 2018
- Jered Dominguez-Trujilo, undergraduate research project, Fall 2017
- Suhardi Hablee, undergraduate research project, Spring 2017
- Aiman Ab ghapar (VUSRP/ACCRE Fellowship), Summer 2016
- Jiaye (James) Fan (ME209C), Spring 2015
- Muhammad Iqbal Hilmy Rusnan (ME209C), Spring 2015
- Mohamed Hafiz Abdul Samad (ME209C), Fall 2014
- Jeremiah Afolabi (ME 209B), Spring 2014
- Faculty advisor for a Senior Design team (NASA/Oreck vacuum cleaner project), Spring 2013
- Clayton Z. Carson (ME 209C), Fall 2012
- Shahrizan Syawal Mohd Adam Das (ME 209C), Summer 2011 and Fall 2011
- Senior Design team of 6 students on the micro air vehicle project (Muhammad Shafiq Hanif Mohamad Hamdan, Ben Bradshaw, Keith A. Becker, Nathan Tardiff, Oluwaseyi O. Senbore, Cong Su), Fall 2010 to Spring 2011
- Stephen A. Malanoski (ME 209A), Spring 2010
- John T. Vollmer (ME 209B), Spring 2010
- MAV design team (Jonathan Hoke, Sam Nackman, Troy Probst, Kira Theuer) through ME 209C, Spring 2010
- Nathan Tardiff (ME 209C), Summer 2010
- Faculty consultant for the Vanderbilt Student Aerospace Club, 2009
- John G. Drew (ME 209C), Spring 2009

Teaching and curriculum workshops participated:

- Junior Faculty Teaching Fellowship Program, Vanderbilt Center for Teaching, Fall 2010 and Spring 2011.
- How to Engineer Engineering Education. Bucknell University. July 18-20, 2010. Lewisburg, PA.
- Fluids Education Lunch Workshop at The 62nd APS/DFD Annual meeting. Nov. 23, 2009. Minneapolis, MN.
- Integration of Simulation Technology into the Engineering Curriculum: A University–Industry Workshop. Swanson Engineering Simulation Program, Cornell University. July 25-26, 2008. Ithaca, NY.

- The 12th Annual Science, Technology, Engineering and Mathematics (STEM) Education Scholars Program. Vanderbilt CIRTL Group. June 2-4, 2008.
- ABET Faculty Workshop on Assessing Program Outcomes. March 15, 2008. Nashville, TN.

Professional and University Service

Editorship:

- Editor, Acta Mechanica Sinica, 2013-2015.

Technical committees and conference organizations:

- AIAA Fluid Dynamics Technical Committee, 2013-present.
- ASME Fluids Engineering Division Computational Fluid Dynamics Technical Committee, 2013-present.
- Local organization committee, the 2018 APS Division of Fluid Dynamics Annual Meeting in Atlanta, GA.
- Deputy Technical Forum Chair for the AIAA SciTech Forum (San Diego, CA), Aerospace Sciences Group, 2019.
- Deputy Technical Forum Chair for the AIAA SciTech Forum (Kissimmee, FL), Aerospace Sciences Group, 2018.
- Chair of the AIAA Future of Fluids Subcommittee (under the Fluid Dynamics Technical Committee), 2014-2017.
- Editorial board, the 2018 Early Career Technical Conference (ECTC), University of Alabama at Birmingham, 2018.
- Editorial board, the 2017 Early Career Technical Conference (ECTC), University of Alabama at Birmingham, 2017.
- Technical Disciplinary Chair, the AIAA 46th Fluid Dynamics Conference at the Aviation Forum 2016, Washington, DC, 2016.
- Editor and reviewer, the 16th Early Career Technical Conference (ECTC), University of Alabama at Birmingham, November 5-6, 2016.
- Member of the Local Organizing Committee, The Engineering Mechanics Institute (EMI) Conference 2016, Nashville, TN, May 22-25, 2016.
- Editor and reviewer, the 15th Early Career Technical Conference (ECTC), University of Alabama at Birmingham, November 7-8, 2015.
- Assistant Organizer (AO) for the Fluid Dynamics Conference at the AIAA 2015 Aviation Forum, Dallas, TX, 2015.
- Assistant Organizer (AO) for the Fluid Dynamics Conference at the AIAA 2014 Aviation Forum, Atlanta, GA, 2014.
- Assistant Organizer (AO) for the Fluid Dynamics Conference at the AIAA 2014 SciTech Forum, National Harbor, MD, 2014.
- Track co-organizer, Symposium on Development and Applications of Immersed Boundary Methods. ASME 2013 Fluids Engineering Division Summer Meeting. July 7-11, 2013. Incline Village, Nevada.

Conference session chairs:

- The AIAA 46th Fluid Dynamics Conference at Aviation Forum 2016, Washington, DC, June 2016.

- The AIAA 2015 SciTech Forum, Kissimmee, FL, January 2015.
- The Fluid Dynamics Conference at the AIAA 2014 Aviation Forum, Atlanta, GA, June 2014.
- The Fluid Dynamics Conference at the AIAA 2014 SciTech Forum, National Harbor, MD, January 2014.
- Symposium on Development and Applications of Immersed Boundary Methods. ASME 2013 Fluids Engineering Division Summer Meeting. July 7-11, 2013. Incline Village, Nevada.
- The 64th Annual Meeting of American Physical Society, Division of Fluid Dynamics (APS/DFD), November 20-22, 2011. Baltimore, Maryland.
- The 63rd Annual Meeting of American Physical Society, Division of Fluid Dynamics (APS/DFD), November 21-23, 2010. Long Beach, California.
- The 48th AIAA Aerospace Sciences and Meeting, January 4-7, 2010. Orlando, Florida.
- The 45th Society of Engineering Science (SES) Annual Technical Meeting, October 12-15, 2008, Urbana-Champaign, IL.
- The 61st Annual Meeting of American Physical Society, Division of Fluid Dynamics (APS/DFD), November 23-25, 2008, San Antonio, TX.

Referee for archived journals:

- Journal of Computational Physics
- Journal of Fluid Mechanics
- Physics of Fluids
- Journal of Fluids and Structures
- Proceedings of the Royal Society A
- AIAA Journal
- ASME Journal of Fluids Engineering
- Journal of Acoustic Society of America
- Journal of the Royal Society Interface
- Aeronautical Journal
- Journal of Biomechanical Engineering
- Computers and Mathematics with Applications
- Computers and Fluids
- Microfluidics & Nanofluidics
- Journal of Engineering Mathematics
- Journal of Biomechanics
- Medical Engineering and Physics
- International Journal of Multiphase Flow
- Journal of Insect Science
- Journal of Aerospace Engineering
- Frontier of Computational Medicine

- Journal of Theoretical Biology
- Journal of Bionic Engineering
- European Journal of Mechanics B – Fluid Mechanics
- Quarterly Journal of Mechanics and Applied Mathematics
- Theoretical & Computational Fluid Dynamics
- Journal of the American Helicopter Society
- Advances in Applied Mathematics and Mechanics
- Nature Scientific Reports
- Bioinspiration and Biomimetics
- Journal of Renewable and Sustainable Energy
- International Journal of Heat and Fluid Flow
- Marine Technology Society Journal
- International Journal of Numerical Methods in Fluids
- PLOS One
- Royal Society Open Science

Proposal reviews:

- Review Panel, the NSF Graduate Research Fellowship Program, 2017
- NSF proposal review panel
- Army Research Office proposal reviewer
- American Chemical Society Petroleum Research Fund proposal reviewer
- Proposal reviewer for the National Fund for Scientific and Technological Development (or FONDECYT), Chile
- Proposal reviewer for the Agence Nationale de la Recherche (France)

Vanderbilt University service:

- Faculty Senate, 2016-present.
- The University Course Committee, 2018.
- Chair of the Faculty Senate Academic Policies and Services, 2017-2018.
- Faculty Senate Ad hoc Committee, 2017.
- Member of the University Graduate Faculty Delegate Assembly, 2008-2012.
- Panelist, CIRTL Workshop: Evidence-based Teaching, Vanderbilt University, May 20, 2016.
- Panelist, Innovative and Effective Teaching by Junior Faculty: Cases from the Junior Faculty Teaching Fellows. Vanderbilt University Center for Teaching, May 3, 2013.

Vanderbilt Engineering school service:

- School IT Committee, 2010 to present.

Vanderbilt Mechanical Engineering (ME) departmental service:

- Departmental seminar organization, 2016-present.
- Member of the ME Department Undergraduate Curriculum Committee, 2007 to present.
- Member of the ME Department Assessment Committee, 2008 to present.
- Academic advisor for mechanical engineering undergraduate students, 2007-present.