
Assistant Professor in Mechanical and Aerospace Engineering;
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Citizen of the Netherlands; Permanent Resident of the US

Education

- PhD, 2011, Department of Aerospace Engineering, University of Michigan, Ann Arbor, USA
 - Dissertation: Aerodynamics, Scaling, and Performance of a Flexible Flapping Wing
 - Advisors: Dr. W. Shyy and Dr. C. E. S. Cesnik
- MSc, 2005, Department of Aerospace Engineering, Delft University of Technology, The Netherlands
 - Thesis: Topological Analysis of Fourth Order Juncture Flow
 - Advisor: Dr. P. G. Bakker
- BSc, 2002, Department of Aerospace Engineering, Delft University of Technology, The Netherlands, Cum Laude

Professional Experience

- 2013 – present, Assistant Professor, Department of Mechanical and Aerospace Engineering, University of Alabama in Huntsville, USA
- 2011 – 2013, Postdoctoral Research Fellow, Department of Aerospace Engineering, University of Michigan, Ann Arbor, USA; Advisor: Dr. W. Shyy
- 2007 – 2011, Graduate Student Research Assistant, Department of Aerospace Engineering, University of Michigan, Ann Arbor, USA; Advisor: Dr. W. Shyy
- 2001 (Jun) – 2001 (Nov), Visiting Scholar, Arizona State University, Tempe, USA; Advisor: Dr. W. Saric

Research Interests

Applied fluid dynamics with focus on modeling and analysis of multi-disciplinary complex systems

- Unsteady aerodynamics, fluid-structure interaction, locomotion in biology, micro-air vehicles, insect flight, butterfly flight, coupled aero/structural/flight dynamics modeling and analysis
- High-fidelity fluid-structure interaction framework coupled to flight dynamics and control
- Application of motion-tracking systems to insects
- Reduced order models for analysis and optimization of complex multidisciplinary systems

Honors and Awards

- UAH Research Infrastructure Fund Award, 2015
- UAH Individual Investigator Distinguished Research Award, 2014
- UAH New Faculty Research Program Award, 2013
- NATO RTO Scientific Achievement Award (AVT-149, Chair: Dr. Michael Ol), 2011

Teaching

- University of Alabama in Huntsville
 - MAE430/530, Fundamentals of Aerodynamics, Undergrad; Grad, 2013F,2014F
 - MAE430, Fundamentals of Aerodynamics, Undergrad, 2015F
 - MAE693, Graduate Engineering Analysis II, Grad, 2014S, 2015S
 - MAE695, Aerodynamics, Grad, 2015S, 2015F
 - MAE695, Compressible Aerodynamics, Grad, 2016S
 - MAE755, Advanced Aerodynamics, Grad, 2014S

Professional Service and Membership

- Reviewer: Journal of Fluid Mechanics, AIAA Journal, Journal of Theoretical Biology, Bioinspiration & Biomimetics, Journal of Fluids and Structures, Journal of Aerospace Engineering, 2014 AIAA Aviation
- Member – The Royal Institution of Engineers in the Netherlands
- Member – AIAA

Book

- B1. Shyy, W., Aono, H., Kang, C. and Liu, H. *An Introduction To Flapping Wing Aerodynamics*, Cambridge University Press, 2013

Journal Publications (supervised students underlined)

- J11 Shyy, W., Kang, C., Chirarattananon, P, Ravi, S., Liu, H. "Aerodynamics, Sensing, and Control of Insect-scale Flapping-Wing Flight," *Proceedings of Royal Society A*, Vol. 472, 2016, pp. 20150712 (invited review paper)
- J10 Sridhar, M. K. and Kang, C., "Aerodynamic Performance of Flexible Flapping Wings at Fruit Fly Scale in Hover Flight," *Bioinspiration & Biomimetics*, Vol 10, 2015, pp. 036007
- J9 Kang, C., and Shyy, W., "Analytical model for instantaneous lift and shape deformation of an insect-scale flapping wing in hover," *Journal of Royal Society Interface*, Vol 11, 2014, pp. 20140933
- J8. Vandenheede, R., Bernal, L. P. B., Morrison, C., Gogulapati, A., Friedmann, P. P., Kang, C., and Shyy, W., "Experimental and Computational Study on Flapping Wings with Bio-Inspired Hover Kinematics," *AIAA Journal*, Vol. 52, Nr. 5, pp. 1047 - 1058, 2014
- J7. Kang, C. and Shyy, W., "Scaling and Lift Generation of Hovering Flexible Wing of Insect Size," *Journal of Royal Society Interface*, Vol. 10, Nr. 85, 2013
- J6. Kang, C., Aono, H., Baik, Y.S., Bernal, L.P., and Shyy, W., "Fluid Dynamics of Pitching and Plunging Flat Plate at Reynolds Number of $O(10^4)$," *AIAA Journal*, Vol. 51, No. 2, pp. 315-329, 2013

- J5. Kang, C., Aono, H., Cesnik, C.E.S., and Shyy, W., "Effects of Flexibility on the Aerodynamic Performance of Flapping Wings," *Journal of Fluid Mechanics*, Vol. 689, pp. 32 - 74, 2011; also AIAA-2011-3121
- J4. Trizila, P., Kang, C., Aono, H., Visbal, M., and Shyy, W., "Low-Reynolds-Number Aerodynamics of a Flapping Rigid Flat Plate," *AIAA Journal*, Vol. 49, No. 4, pp. 806 - 823, 2011
- J3. Shyy, W., Aono, H., Chimakurthi, S., Trizila, P., Kang, C., Cesnik, C., and Liu, H., "Recent Progress in Flapping Wing Aerodynamics and Aeroelasticity," *Progress in Aerospace Sciences*, Vol. 48, Nr. 7, pp. 284-327, 2010
- J2. Ol, M., Bernal, L., Kang, C., and Shyy, W., "Shallow and Deep Dynamic Stall for Flapping Low Reynolds Number Airfoils," *Experiments in Fluids*, Vol. 46, Nr. 5, pp. 883-901, 2009
- J1. Shyy, W., Trizila, P., Kang, C., Aono, H., "Can Tip Vortices Enhance Lift of a Flapping Wing?," *AIAA Journal*, Vol. 47, pp. 289-293, 2009

Conference Papers and Presentations (supervised students underlined)

- C18 Bluman, J. E., Sridhar, M. K., and Kang, C., " The Influence of Wing Flexibility on the Longitudinal Dynamics of a Flapping Wing Micro Air Vehicle in Hover," AIAA 2016-0470, 57th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, San Diego, California, January 4-8, 2016
- C17 Deepa, K. and Kang, C., " Analytical Aerodynamic Model of Chordwise Flexible Flapping Wings in Forward Flight," AIAA 2016-1064, 54th AIAA Aerospace Sciences Meeting, San Diego, California, January 4-8, 2016
- C16 Cranford, J., Kang, C., Landrum, D.B., and Slegers, N. "Experimental Characterization of Butterfly in Climbing Flight," AIAA 2015-2328, AIAA AVIATION, Dallas, Texas, June 22-26, 2015
- C15 Sridhar, M. K. and Kang, C., "Aerodynamic Performance of Flexible Flapping Wings at Bumblebee Scale in Hover Flight," AIAA 2015-0254, 53th AIAA Aerospace Sciences Meeting, Kissimmee, Florida, January 5-9, 2015
- C14 Sridhar, M. K. and Kang, C., "Effects of Flexible Wings in Hover Flight at Fruit Fly Scale," AIAA 2014-2311, 44th AIAA Fluid Dynamics Conference, Atlanta, Georgia, June 16 - 20, 2014
- C13 Kang, C., and Shyy, W., "A Quasi-Steady Model for the Lift on a Hovering Flexible Wing," AIAA 2014-1114, 52nd Aerospace Science Meeting, National Harbor, Maryland, January 13 - 17, 2014
- C12. Kang, C., and Shyy, W., "Modeling of Instantaneous Passive Pitch of Flexible Flapping Wings," AIAA 2013-2469, 43rd AIAA Fluid Dynamics Conference, San Diego, California, June 24 - 27, 2013
- C11. Vandenheede, R.B.R, Bernal, L.P., Morrison, C., Gogulapati, A., Friedmann, P.P., Kang, C.,

- and Shyy, W., "Comparison of Experiments on Bio-Inspired Hover Kinematics with The Unsteady Vortex Model and CFD, " AIAA 2013-0066, 51th AIAA Aerospace Science Meeting Including the New Horizons Forum and Aerospace Exposition, Grapevine, Texas, January 7 – 10, 2013
- C10. Kang, C., and Shyy, W., " Passive Wing Rotation in Flexible Flapping Wing Aerodynamics," AIAA-2012-2763, 30th AIAA Applied Aerodynamics Conference, New Orleans, Louisiana, June 25 - 28, 2012
- C9. Kang, C., and Shyy, W., "Effects of Flexibility on the Aerodynamics of a Hovering Flexible Airfoil at Reynolds Number of 100 to 1000," AIAA-2012-1206, 50th AIAA Aerospace Science Meeting, Nashville, Tennessee, January 9 - 12, 2012
- C8. Kang, C., Aono, H., Cesnik, C.E.S., and Shyy, W., "Effects of Flexibility on the Aerodynamic Performance of Flapping Wings," AIAA-2011-3121, 6th AIAA Theoretical Fluid Mechanics Conference, Honolulu, Hawaii, June 27-30, 2011
- C7. Kang, C., Aono, H., Cesnik, C.E.S., and Shyy, W., "A Scaling Parameter for Thrust Generation of Flapping Flexible Wings," AIAA-2011-1313, 49th AIAA Aerospace Sciences Meeting, Orlando, Florida, 4 - 7 January 2011
- C6. Aono, H., Kang, C., Cesnik, C.E.S., and Shyy, W., "A Numerical Framework for Isotropic and Anisotropic Flexible Flapping Wing Aerodynamics and Aeroelasticity," AIAA-2010-5082, 28th AIAA Applied Aerodynamics Conference, Chicago, Illinois, June 28-1, 2010
- C5. Trizila, P., Kang, C., Aono, H., Visbal, M., and Shyy, W., "Fluid Physics and Surrogate Modeling of a Low Reynolds Number Flapping Rigid Flat Plate," AIAA 2010-5081, 28th AIAA Applied Aerodynamics Conference, 28 June - 1 July 2010, Chicago, Illinois
- C4. Kang, C., Aono, H., Trizila, P., Baik, Y., Rausch, J.M., Bernal, L., Ol, M.V., and Shyy, W., "Modeling of Pitching and Plunging Airfoils of Reynolds Number between 1×10^4 and 6×10^4 ", AIAA-2009-4100, 27th AIAA Applied Aerodynamics Conference, San Antonio, Texas, June 22-25, 2009
- C3. Kang, C., Baik, Y., Bernal, L., Ol, M.V., and Shyy, W., "Fluid Dynamics of Pitching and Plunging Airfoils of Reynolds Number between 1×10^4 and 6×10^4 ", AIAA-2009-536, 47th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Orlando, Florida, Jan. 5-8, 2009
- C2. Trizila, P., Kang, C., Visbal, M., and Shyy, W., "A Surrogate Model Approach in 2-D Versus 3-D Flapping Wing Aerodynamic Analysis", AIAA-2008-5914, 12th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Victoria, British Columbia, September, 2008
- C1. Trizila, P., Kang, C., Visbal, M., and Shyy, W., "Unsteady Fluid Physics and Surrogate Modeling of Low Reynolds Number, Flapping Airfoils", AIAA-2008-3821, 38th Fluid Dynamics Conference and Exhibit, Seattle, Washington, June 2008

Conference Presentations

- 5 Shyy, W. and Kang, C., "Time-Accurate Estimate of Flexible Flapping Wing Aerodynamics," Invited Presentation, 7th World Congress of Biomechanics, Boston, Massachusetts, July 6 - 11, 2014
4. Shyy, W., Kang, C., and Cho, Y., "Adaptive and Passive Flow Control via Actuation and Flexible Structures at Low Reynolds Number," 5th International Symposium on Fluid Machinery and Fluids Engineering, Jeju, Korea, October 24 – 27, 2012
3. Su, W., Kang, C., and Cesnik, C.E.S., "Nonlinear Aeroelastic Analysis of Flapping Wing Micro Air Vehicles with a Surrogate Aerodynamic Model," International Forum on Aeroelasticity and Structural Dynamics 2011, Paris, France, June 26–30, 2011
2. Kang, C., Aono, H., and Shyy, W., "Scaling in Flexible Flapping Wings," American Physical Society, 64th Annual Meeting of the Division of Fluid Dynamics, Baltimore, Maryland, November 19 - 22, 2011
1. Saric, W., Reed, H., Kang, C., Gladden, R., Gabet, P., and Clevenger, D., "Supersonic Laminar Flow Control on Swept Wings Using Distributed Roughness Experiments," American Physical Society, 54th Annual Meeting of the Division of Fluid Dynamics, San Diego, California, November 18 - 20, 2001

Professional Presentations and Workshops

- University of Alabama, Tuscaloosa, Feb. 25, 2016 (Invited Seminar)
- UAH AIAA Student Chapter, Huntsville, AL, Feb 2, 2016
- University of Maryland, MD, July 10, 2015
- CFDRC, Huntsville, AL, Aug 30, 2013 (Invited Seminar)
- University of Alabama in Huntsville, Huntsville, AL, Apr 1, 2013
- Siemens Corporate Research, Princeton, NJ, Feb 21, 2013
- Korea Advanced Institute of Science and Technology, Daejeon, Korea, Dec 22, 2011 (Invited Seminar)