Ming-Chen Hsu | **Associate Professor** of Mechanical Engineering at Iowa State University 04/10/2023

jmchsu@iastate.edu | +1-515-294-4632 | https://scholar.google.com/citations?user=p0QKtBMAAAAJ

Education

- PhD, Structural Engineering, University of California, San Diego, 09/2008–09/2012
- MS, Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, 08/2006–05/2008

Experience

- Associate Professor with Tenure, Mechanical Engineering, Iowa State University, 08/2019–present
- Assistant Professor, Mechanical Engineering, Iowa State University, 08/2013–07/2019
- Postdoctoral Fellow, Oden Institute for Computational Engineering and Sciences, 08/2012–07/2013

Honors and Awards

- **2020** CoE Award for Early Achievement in Research
- **2020** WoS Highly Cited Researcher in Cross-Field
- **2019** USACM Gallagher Young Investigator Award
- **2019** WoS Highly Cited Researcher in Cross-Field
- **2018** WoS Highly Cited Researcher in Computer Science
- **2017** WoS Highly Cited Researcher in Computer Science
- **2017** WoS Highly Cited Researcher in Engineering
- **2016** WoS Highly Cited Researcher in Computer Science
- **2015** Warren Lecture at the University of Minnesota
- **2013** UC San Diego Chancellor's Dissertation Medal

Mentoring

- 9 PhD students (8 graduated), 8 MS students (5 graduated), and 18 undergraduate students
- 13 women and underrepresented minority students, including Heather Muchowski (faculty at Westminster College) and Emily Johnson (faculty at Notre Dame)

Others

- **Associate Editor**, *Journal of Mechanics* (2021–present)
- **Editorial Board**, *Computer Methods in Applied Mechanics and Engineering* (2022–present)
- **Plenary Lecture** at IGA2023
- **Semi-Plenary Lecture** at ACFD2022
- **Keynote Lectures** at WCB2022, APCOM2019, SES2019, ACFD2018, SES2016, IWACOM-III2015, FEF2015
- **29 Departmental Seminars** and **8 Other Invited Lectures**

USACM Service and Conference Contributions

- **Vice Chair**, IGA TTA Committee, 07/2021–present
- **Chair**, CFD & FSI TTA Committee, 07/2019–07/2021
- **Vice Chair**, CFD & FSI TTA Committee, 07/2015–07/2019
- **Conference Co-Chair**, USACM Thematic Conference on Computational Fluid–Structure Interaction: Frontiers in Methods and Applications (CFSI2023), 10/22–10/25/2023
- **Conference Co-Chair**, 10th International Conference on Isogeometric Analysis (IGA2022), 11/06–11/09/2022
- **Conference Co-Chair**, Virtual Isogeometric Analysis 2020 (VIGA2020), 08/11–08/12/2020
- **Co-Organizer**, USACM CFD/FSI Virtual Seminar Series, 2021–present
- **Scientific Committee of USACM Conferences:** USNCCM17, USNCCM16, IGA2018, IGA2016
- **24 USACM Conference MS Co-Organized:** USNCCM17(4), CFSI2023(1), MMLDT-CSET2021(1), USNCCM16(3), USNCCM15(3), FEF2019(1), IGA2018(1), WCCM-XIII(2), USNCCM14(2), IGA2016(2), USNCCM13(4)
- **65 USACM Conference Abstracts:** IGA2022(4), MMLDT-CSET2021(1), USNCCM16(9), VIGA2020(2), USNCCM15(5), FEF2019(2), IGA2018(8), WCCM-XIII(3), USNCCM14(2), IGA2016(7), USNCCM13(9), IGA2014(6), ACM2013(1), IGA2011(1), USNCCM10(5)
- **Keynote Lectures** at USNCCM16, FEF2019, USNCCM14

Other Professional Service

- **Study Section Member**, NIH Bioengineering, Technology, and Surgical Sciences (BTSS) Study Section, 06/2023; 02/2022; 10/2021; 06/2021; 02/2021; 10/2020
- **Study Section Member**, NIH Small Business: Cardiovascular and Surgical Devices – ISB (12) Study Section, 03/2023
- **Study Section Member**, NIH Center for Scientific Review Special Emphasis Panel (ZRG1) Study Section, 07/2022
- **Peer Reviewer** for 60 scientific journals, including CMAME, CM, IJNME, IJNMBE, IJNMF, EWCO, C&F, CAMWA, etc.
- **Scientific Committee** of IGA2023, IGA2021, COUPLED2023, WCCM-APCOM2022, ESB2021, COUPLED2021, WCCM-XIV, IGA2019, EMI2018, IGA2017, EMI2017, IGA-MF2016, EMI2018, IGA2017, EMI2017
- **Chair**, Technical Committee on Computational FSI, Applied Mechanics Division, ASME, 2016–2019
- **Guest Editor**, Special Issue of Journal of Mechanics on Recent Advances in Isogeometric Analysis, 2021–2022

Summary of Scholarly Contributions

- Refereed Journal Papers: **95**; Google Scholar Citations: **10834**; *h*-index: **48**
- Refereed Conference Papers: 28; Refereed Book Chapters: 10; Other Conference Contributions: 165
- Full publication list at https://web.me.iastate.edu/jmchsu/publications.html

Selected Recent Publications (Hsu's trainees underlined)

- Neighbor GE, Zhao H, Saraeian M, Hsu M-C, Kamensky D, **Leveraging code generation for transparent immersogeometric fluid–structure interaction analysis on deforming domains**. *Engineering with Computers*, accepted, 2023. https://doi.org/10.1007/s00366-022-01754-y

- Balu A, Rajanna MR, Khristy J, Xu F, Krishnamurthy A, Hsu M-C. **Direct immersogeometric fluid flow and heat transfer analysis of objects represented by point clouds**. *Computer Methods in Applied Mechanics and Engineering*, 404:115742, 2023.
- Rajanna MR, Johnson EL, Liu N, Korobenko A, Bazilevs Y, Hsu M-C. **Fluid–structure interaction modeling with nonmatching interface discretizations for compressible flow problems: computational framework and validation study**. *Mathematical Models and Methods in Applied Sciences*, 32:2497–2528, 2022.
- You H, Zhang Q, Ross CJ, Lee C-H, Hsu M-C, Yu Y. **A physics-guided neural operator learning approach to model biological tissues from digital image correlation measurements**. *Journal of Biomechanical Engineering*, 144:121012, 2022.
- Rajanna MR, Johnson EL, Codoni D, Korobenko A, Bazilevs Y, Liu N, Lua J, Phan N, Hsu M-C. **Finite element methodology for modeling aircraft aerodynamics: development, simulation, and validation**. *Computational Mechanics*, 70:549–563, 2022.
- Johnson EL, Rajanna MR, Yang C-H, Hsu M-C. **Effects of membrane and flexural stiffnesses on aortic valve dynamics: identifying the mechanics of leaflet flutter in thinner biological tissues**. *Forces in Mechanics*, 6:100053, 2022.
- Liu N, Johnson EL, Rajanna MR, Lua J, Phan N, Hsu M-C. **Blended isogeometric Kirchhoff–Love and continuum shells**. *Computer Methods in Applied Mechanics and Engineering*, 385:114005, 2021.
- Johnson EL, Laurence DW, Xu F, Crisp CE, Mir A, Burkhart HM, Lee C-H, Hsu M-C. **Parameterization, geometric modeling, and isogeometric analysis of tricuspid valves**. *Computer Methods in Applied Mechanics and Engineering*, 384:113960, 2021.
- Xu F, Johnson EL, Wang C, Jafari A, Yang CH, Sacks MS, Krishnamurthy A, Hsu M-C. **Computational investigation of left ventricular hemodynamics following bioprosthetic aortic and mitral valve replacement**. *Mechanics Research Communications*, 112:103604, 2021.
- Johnson EL, Wu MCH, Xu F, Wiese NM, Rajanna MR, Herrema AJ, Ganapathysubramanian B, Hughes TJR, Sacks MS, Hsu M-C. **Thinner biological tissues induce leaflet flutter in aortic heart valve replacements**. *Proceedings of the National Academy of Sciences*, 117:19007–19016, 2020.
- Johnson EL, Hsu M-C. **Isogeometric analysis of ice accretion on wind turbine blades**. *Computational Mechanics*, 66:311–322, 2020.
- Balu A, Nallagonda S, Xu F, Krishnamurthy A, Hsu M-C, Sarkar S. **A deep learning framework for design and analysis of surgical bioprosthetic heart valves**. *Scientific Reports*, 9:18560, 2019.
- Wu MCH, Muchowski HM, Johnson EL, Rajanna MR, Hsu M-C. **Immersogeometric fluid–structure interaction modeling and simulation of transcatheter aortic valve replacement**. *Computer Methods in Applied Mechanics and Engineering*, 357:112556, 2019.
- Herrema AJ, Johnson E, Proserpio D, Kiendl J, Hsu M-C. **Penalty coupling of non-matching isogeometric Kirchhoff–Love shell patches with application to composite wind turbine blades**. *Computer Methods in Applied Mechanics and Engineering*, 346:810–840, 2019.
- Xu F, Bazilevs Y, Hsu M-C. **Immersogeometric analysis of compressible flows with application to aerodynamic simulation of rotorcraft**. *Mathematical Models and Methods in Applied Sciences*, 29:905–938, 2019.
- Herrema AJ, Kiendl J, Hsu M-C. **A framework for isogeometric analysis-based design and optimization of wind turbine blade structures**. *Wind Energy*, 22:153–170, 2019.
- Wu MCH, Zakerzadeh R, Kamensky D, Kiendl J, Sacks MS, Hsu M-C. **An anisotropic constitutive model for immersogeometric fluid–structure interaction analysis of bioprosthetic heart valves**. *Journal of Biomechanics*, 74:23–31, 2018.
- Xu F, Morganti S, Zakerzadeh R, Kamensky D, Auricchio F, Reali A, Hughes TJR, Sacks MS, Hsu M-C. **A framework for designing patient-specific bioprosthetic heart valves using immersogeometric fluid–structure interaction analysis**. *International Journal for Numerical Methods in Biomedical Engineering*, 34:e2938, 2018.
- Kamensky D, Xu F, Lee C-H, Yan J, Bazilevs Y, Hsu M-C. **A new contact formulation based on a volumetric potential: Application to isogeometric simulations of atrioventricular valves**. *Computer Methods in Applied Mechanics and Engineering*, 330:522–546, 2018.
- Wu MCH, Kamensky D, Wang C, Herrema AJ, Xu F, Pigazzini MS, Verma A, Marsden AL, Bazilevs Y, Hsu M-C. **Optimizing fluid–structure interaction systems with immersogeometric analysis and surrogate modeling: application to a hydraulic arresting gear**. *Computer Methods in Applied Mechanics and Engineering*, 316:668–693, 2017.