Benjamin A. Jasperson, Ph.D., P.E.

Postdoctoral Scholar - Research Associate
University of Southern California
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Pronouns: he/him/his

EDUCATION

2024 **University of Illinois Urbana - Champaign**, Urbana, IL
Ph.D. in Theoretical and Applied Mechanics
w/ Graduate Concentration in Data Science & Engineering
Dept. of Mechanical Science & Engineering
Advisor: Harley T. Johnson, Ph.D.
Towards Data-Driven Inverse Design for Materials and Structures

2010 **University of Wisconsin - Madison**, Madison, WI
M.S. in Mechanical Engineering
Dept. of Mechanical Engineering
Advisors: Frank Pfefferkorn, Ph.D., and Kevin Turner, Ph.D.
Development and Calibration of Microscale Heat Flux Sensors Fabricated on Bulk Copper Substrates

2008 **University of Wisconsin - Madison**, Madison, WI
B.S. in Mechanical Engineering
w/ Certificate in Business
Dept. of Mechanical Engineering

PROFESSIONAL EXPERIENCE

2024 - Postdoctoral Scholar - Research Associate
Prof. Krishna Garikipati's group
University of Southern California, Los Angeles, CA

2017 - 2020 Mechanical Engineer
Start-up company designing and producing high-yield neutron sources for medicine, defense and energy sectors.

2010 - 2017 Senior Mechanical Design Engineer
Design and manufacturing company focused on projects in healthcare/life sciences, industrial/commercial, defense/security/aerospace, and networking/telecommunications.

PUBLICATIONS AND PATENTS

See Google Scholar for a research impact summary.

Journal Articles

2025 **B. A. Jasperson**, I. Nikiforov, B. Runnels, H. T. Johnson, and E. B. Tadmor, "Fundamental Microscopic Properties as Predictors of Large-Scale Quantities of Interest: Validation through Grain Boundary Energy Trends," *Acta Materialia*, p. 120722, Jan. 2025.

2025 **B. A. Jasperson**, I. Nikiforov, A. Samanta, F. Zhou, E. B. Tadmor, V. Lordi, and V. V. Bulatov, "Cross-scale covariance for material property prediction," *npj Computational Materials*, vol. 11, no. 1, p. 1, Jan. 2025.

2024 **B. A. Jasperson** and H. T. Johnson, "A data-driven method for optimization of classical interatomic potentials," *MRS Advances*, vol. 9, no. 11, pp. 863–869, Mar. 2024

2024 **B. A. Jasperson**, M. G. Wood, and H. T. Johnson, "A Dual Neural Network Approach to Topology Optimization for Thermal-Electromagnetic Device Design," *Computer-Aided Design*, vol. 168, p. 103665, Mar. 2024

2014 **B. A. Jasperson**, J. Schmale, W. Qu, F. E. Pfefferkorn, and K. T. Turner, "Thin film heat flux sensors fabricated on copper substrates for thermal measurements in microfluidic environments," *J. Micromech. Microeng.*, vol. 24, no. 12, p. 125018, Dec. 2014.

2010 **B. A. Jasperson**, Yongho Jeon, K. T. Turner, F. E. Pfefferkorn, and Weilin Qu, "Comparison of Micro-Pin-Fin and Microchannel Heat Sinks Considering Thermal-Hydraulic Performance and Manufacturability," *IEEE Trans. Comp. Packag. Technol.*, vol. 33, no. 1, pp. 148–160, Mar. 2010.

Conference Proceedings

2021 M. Wood, A. McKay, T. Morin, D. Serkland, T. Luk, S. Wolfley, L. Gastian, J., **B. A. Jasperson**, and H. T. Johnson, "Optically-Triggered Optical Limiters for Short-Wavelength Infrared Sensor Protection," presented at CLEO, virtual, STh1E.3, 2021

2010 **B. A. Jasperson**, F. E. Pfefferkorn, W. Qu, and K. T. Turner, "A thin-film heat flux sensor fabricated on copper for heat transfer measurements in parallel channel heat sinks," in *Proceedings of the 5th International Conference on Micromanufacturing*, p 437-444, 2010.

2009 C. Konishi, W. Qu, **B. A. Jasperson**, F. Pfefferkorn, and K. T. Turner, "Experimental study of adiabatic water liquid-vapor two-phase pressure drop across an array of staggered micro-pin-fins," *ASME International Mechanical Engineering Congress and Exposition Proceedings*, v10, p 1597-1605, 2009 (peer-reviewed).

Patents

2019 P. Anderson, K. Novak, K. Mclennan, M. Mackaplow, G. Song, G. S. Dhami, **B. Jasperson**, S. Smieja, M. Svacina, "Devices and methods for delivering a beneficial agent to a user," 10213546, Feb. 26, 2019.

INVITED TALKS

2024 "Towards Data-Driven Inverse Design for Materials and Structures"
National Institute of Standards and Technology (NIST), Thermodynamics and Kinetics Group

CAMPUS / DEPARTMENTAL TALKS

2023 "Towards Data-Driven Inverse Design for Materials and Structures," seminar speaker, Virtual, iShare seminar series (UIUC, UIC, Duke), July 2023

2022 "Optimization of an Optical Shutter using Machine Learning," presented at Sandia Academic Alliance - University of Illinois LDRD Mini-Conference, Urbana, IL, Sept 2022.

2022 "Experiences / lessons learned from post-grad school industry life," UIUC, DIGI-MAT Professional Development Seminar, July 2022

2021 "Rclone," UIUC, DIGI-MAT Professional Development Seminar, July 2021

RESEARCH / CONFERENCE PRESENTATIONS

Presentations Given

2024 **B. Jasperson**, H. Johnson, "Towards data-driven inverse design for interatomic potentials," presented at the Engineering Mechanics Institute Conference and Probabilistic Mechanics & Reliability Conference (EMI/PMC 2024), Chicago, IL, May 27-30, 2024.

2023 **B. Jasperson**, H. Johnson, "Using data and machine learning to simplify and accelerate inverse design and model development in materials," poster, presented at the Society of Engineering Science (SES) Future Faculty Symposium, Minneapolis, MN, Oct 8-11, 2023.

2023 **B. Jasperson**, I. Nikiforov, H. Johnson, E. Tadmor, "Predicting Grain Boundary Energy from Few-Atom Simulations: A Study Across Interatomic Potentials," presented at the Society of Engineering Science (SES) Annual Technical Meeting, Minneapolis, MN, Oct 8-11, 2023.

2023 **B. Jasperson**, M. Wood, H. Johnson, "Inverse Design and Fabrication of a Vanadium Dioxide Optical Device using a Dual Neural Network Topology Optimization Approach," presented at the 17th U.S. National Congress on Computational Mechanics (USNCCM), Albuquerque, NM, July 23-27, 2023.

2022 **B. Jasperson**, M. Wood, H. Johnson, "Optimization of an Optical Shutter using Machine Learning," presented at the Society of Engineering Science (SES) Annual Technical Meeting, College Station, TX, Oct 16-19, 2022.

2022 **B. Jasperson**, "Optimization of an Optical Shutter using Machine Learning," presented at Harnessing Data for Materials Symposium, Chicago, IL, Aug 19-30, 2022.

2010 **B. Jasperson**, F. Pfefferkorn, W. Qu, K. Turner, "A thin-film heat flux sensor fabricated on copper for heat transfer measurements in parallel channel heat sinks," presented at the 5th International Conference on Micromanufacturing (ICOMM), Madison, WI, April 5-8, 2010.

Coauthored Presentations (selected)

2025	E. Tadmor, **B. Jasperson**, I. Nikiforov, A. Samanta, F. Zhou, B. Runnels, H. Johnson, V. Lordi, V. Bulatov, "Cross-scale covariance for material property prediction," presented at APS Global Physics Summit, Mar 16-21, 2025.
2025	R. Gulati, **B. Jasperson**, K. Garikipati, "Transformer Models in Continuum Mechanics," presented at SIAM Conference on Computational Science and Engineering, Fort Worth, TX, Mar 3-7, 2025
2009	B. Smith, **B. Jasperson**, and S. Manakasettharn, "Micro-Machined Molds for Manufacturing Micro-Fluidic Devices Using Soft Lithography," poster, presented at International Manufacturing Science and Engineering Conference-MSEC, West Lafayette, IN, Oct 4-7, 2009.

RESEARCH EXPERIENCE

2020 - 2024	Research Assistant Prof. Harley Johnson's group University of Illinois Urbana-Champaign, Urbana, IL
2023	DIGI-MAT Graduate Internship Prof. Ellad Tadmor's group University of Minnesota Twin Cities, Minneapolis, MN
2021 - 2023	National Science Foundation (NSF) Graduate Trainee University of Illinois Urbana-Champaign, Urbana, IL
2008 - 2010	Research Assistant Prof. Frank Pfefferkorn's and Prof. Kevin Turner's groups (co-advised) University of Wisconsin - Madison, Madison, WI

TEACHING AND MENTORING EXPERIENCE

2025	Instructor, USNCCM Short Course, "Fine-tuning large language models for Computational Mechanics," Summer 2025 (accepted course)
2024 -	Mentor to two master's students, Prof. Krishna Garikipati's group University of Southern California
2023	Teaching Assistant, Introductory Solid Mechanics (TAM251) University of Illinois Urbana-Champaign, Fall 2023
2022 - 2023	Mentor, Undergraduate Research Apprenticeship Program (URAP) University of Illinois Urbana-Champaign
2017 - 2020	"Project Planning for Engineers" Milwaukee School of Engineering (MSOE), ME 490 Senior Design Class
2016 - 2018	"Prototyping" UW-Madison, ME Senior Design Class
2012	Mentor, FIRST Robotics NEW Apple Corps - Team 93 (Appleton, WI)
2010 - 2020	Industry mentor for multiple interns and full-time hires

AWARDS, GRANTS AND ACHIEVEMENTS

2024	Top ten finalist, USNC/TAM 5MT Virtual Thesis Competition
2023	List of "Teachers Ranked as Excellent by Their Students" University of Illinois Urbana-Champaign, Fall 2023
2023	Accepted to the Future Faculty Symposium Society of Engineering Science, 2023
2023	Mavis Future Faculty Fellow (MF3) University of Illinois Urbana - Champaign
2021	DIGI-MAT NSF Graduate Traineeship
2014	Article selected as "Highlights of 2014", *J. Micromech. Microeng.*
2008	Graduated with Distinction University of Wisconsin, Madison

LICENSES AND CERTIFICATIONS

2024	Certificate in Foundations of Teaching Center for Innovation in Teaching & Learning (CITL) University of Illinois Urbana-Champaign
2023	Graduate College Mentoring Certificate University of Illinois Urbana-Champaign
2016 -	Professional Engineer (P.E.), State of Wisconsin (Credential/License #45161)

ACADEMIC AND PROFESSIONAL SERVICE

2024	Volunteer Judge, Undergraduate Research Symposium University of Illinois Urbana - Champaign
2021 - 2022	Students Advising on Graduate Education (SAGE) University of Illinois Urbana - Champaign
2021 -	USACM - Member
2019 -	ASME - Member
2005 -	Tau Beta Pi – Wisconsin Alpha Chapter, Illinois Alpha Chapter

Last updated on Jan 26, 2025