

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

Postdoctoral Scholar - Research Associate  
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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 5<sup>th</sup> 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. Dhimi, **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 5<sup>th</sup> 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