

Xuan Song

CURRICULUM VITAE

Email: xuan-song@uiowa.edu | Tel: (319)335-5680 | Web: <https://am.lab.uiowa.edu>
4609 Seamans Center, the University of Iowa, Iowa City, IA 52242-1527

RESEARCH INTEREST

My research focuses on studying *how gentle material-forming mechanisms found in nature can be leveraged to enable ultra-low-temperature additive manufacturing of novel ceramics and composites, specifically for applications in high temperature (> 2000 °C) and high strain-rate (> 100 s⁻¹) environments.*

EDUCATION

PhD	University of Southern California , Los Angeles, USA Industrial & Systems Engineering Dissertation: <i>Slurry-based Stereolithography: A Solid Freeform Fabrication Method of Ceramics and Composites</i> Committee: Yong Chen (advisor), Behrokh Khoshnevis, Satyandra K. Gupta	08/2016
M.S.	University of Southern California , Los Angeles, USA Computer Science	05/2016
M.S.	Zhejiang University , Hangzhou, China Mechanical Engineering	03/2011
B.S.	Wuhan University , Wuhan, China Mechanical Engineering	06/2008

PROFESSIONAL EXPERIENCE

07/2023-present	Associate Professor (with tenure), Industrial and Systems Engineering, University of Iowa, Iowa City, IA
07/2023-present	Associate Professor (by Courtesy), Mechanical Engineering, University of Iowa
08/2016-06/2023	Assistant Professor, Industrial and Systems Engineering, University of Iowa
02/2023-06/2023	Assistant Professor (by Courtesy), Mechanical Engineering, University of Iowa
05/2017-present	Affiliated faculty researcher, Iowa Technology Institute (<i>formerly CCAD</i>), University of Iowa
09/2012-present	Member, American Society of Mechanical Engineers (ASME)
12/2017-present	Member, American Ceramic Society (ACerS)
07/2020-present	Member, Society of Manufacturing Engineers (SME)

HONORS AND AWARDS

- 2024 Air Force Office of Scientific Research Young Investigator Program (YIP) Award
- 2023-present James A. Chisman Faculty Fellowship, University of Iowa
- 2023 Early Career Faculty Excellence Award, College of Engineering, University of Iowa; presented annually to one early-career faculty member across the entire college
- 2023 National Science Foundation CAREER Award
- 2022 Sandra L. Bouckley Outstanding Young Manufacturing Engineer Award, Society of Manufacturing Engineers, USA
- 2022 Best Paper Award, *Quality, Statistics, and Reliability* (QSR) Track, INFORMS
- 18/19/20/23 On the list of “Faculty or staff recognized by students as making a positive difference in their lives,” University of Iowa
- 2018 Old Gold Summer Fellowship, University of Iowa
- 2017 Outstanding Young Reviewer, North American Manufacturing Research Institution of SME (NAMRI/SME)
- 2014 The Grand Prize, USC Maseeh Entrepreneurship Prize Competition (MEPC), along with \$50K in cash and \$20K in legal services for *ComfortCorrect*
- 2014 Finalist, USC Maseeh Entrepreneurship Prize Competition (MEPC), for *VisionFab*, to commercialize a low-cost 3D printer with high resolution and fast speed

PUBLICATIONS

Journal Articles:

- J1. Fei, F., Kirby, L., Graczyk, A., and **Song, X.**, 2023. “*Binder-free Additive Manufacturing of Ceramics using Hydrothermal-assisted Jet Fusion.*” Journal of the European Ceramic Society.
- J2. Kirby, L., Lawrence, A., Udaykumar, H.S., Sippel, T., and **Song, X.**, 2023. “*Pressure-assisted Binder Jet Additive Manufacturing of Solid Propellants.*” Additive Manufacturing, p.103808.
- J3. Kirby, L., Udaykumar, H.S., **Song, X.**, 2023. “*Pressure-assisted Binder Jetting for Additive Manufacturing of Mock Energetic Composites.*” Propellants, Explosives, Pyrotechnics.
- J4. Kirby, L., H.S., Sippel, T., Udaykumar, **Song, X.**, 2023. “*Defect Generation in Polymer-bonded Explosives Exposed to Internal Gas Injection.*” Journal of Applied Physics.
- J5. Scott, M., Bangel, A.W., **Song, X.**, and Xie, Y., 2023. “*Acoustic-modulated, Selective Particle Deposition for Multi-material Additive Manufacturing.*” Advanced Materials Technologies. Featured on the **inside back cover.**
- J6. Guo, Z., Fei, F., **Song, X.**, Zhou, C., 2023. “*Analytical Study of Shear-Thinning Fluid Flow in Direct Ink Writing Process.*” ASME Journal of Manufacturing Science and Engineering.

- J7. Kirby, L., Fei, F., and **Song, X.**, 2023. “*Stress Shielding Effect in Pressure-assisted Binder Jetting.*” Powder Technology.
- J8. Unnadkat, A., Kirby, L., Kulanthavel, S., Rysavy, O., Tsujimoto, A., **Song, X.** and Teixeira, E.C., 2023. “*The Effect of Sintering on Zirconia Manufactured via Suspension-Enclosing Projection Stereolithography for Dental Applications: An In Vitro Study.*” Materials, 17(1), p.14.
- J9. Wang, X., Wang, C., **Song, X.**, Kirby, L., and Wu, J., 2022. “*Regularized Multi-output Gaussian Convolution Process with Domain Adaptation.*” IEEE Transactions on Pattern Analysis and Machine Intelligence.
- J10. Bell, S., Bangel, A., Weerakkody, T., **Song, X.**, and Lamuta, C., 2022. “*Automated Manufacturing System for Carbon Fiber-based Twisted and Coiled Artificial Muscles (TCAMs).*” Manufacturing Letters.
- J11. Fei, F., Kotak, P., He, L., Li, X., Vanderhoef, C., Lamuta, C., **Song, X.**, 2021. “*Cephalopod-inspired Stretchable Self-morphing Skin via Embedded Printing and Twisted Spiral Artificial Muscles.*” Advanced Functional Materials. Featured on the **inside back cover**.
- J12. He, L., Wang, X., Fei, F., Chen, L., **Song, X.**, 2021. “*Selectively Doped Piezoelectric Ceramics with Tunable Piezoelectricity via Suspension-Enclosing Projection Stereolithography.*” Additive Manufacturing.
- J13. Remy, M., Akkouch, A., He, L., Eliason, S., Sweat, M., Krongbamee, T., Fei, F., Qian, F., Amendt, A.; **Song, X.**, Hong, L., 2021. “*Rat Calvarial Bone Regeneration by 3D-Printed Beta-Tricalcium Phosphate Incorporating MicroRNA-200c.*” ACS Biomaterials Science & Engineering.
- J14. Yang, W., Wang, Z., Yang, T., He, L., **Song, X.**, Liu, Y., Chen, L., 2021. “*Exploration of the Underlying Space in Microscopic Images via Deep Learning for Additively Manufactured Piezoceramics.*” ACS Applied Materials & Interfaces.
- J15. Fei, F., He, L., Kirby, L., and **Song, X.**, 2020. “*Study of Droplet Diffusion in Hydrothermal-assisted Transient Jet Fusion of Ceramics.*” ASME Journal of Manufacturing Science and Engineering, 143(5), p.051001.
- J16. Henprasert, P., Dawson, D., El-Kerdani, T., **Song, X.**, Couso-Queiruga, E., Holloway, J., 2020. “*Comparison of the Accuracy of Implant Position using Surgical Guides Fabricated by Additive and Subtractive Techniques.*” Journal of Prosthodontics.
- J17. Fei, F., He, L., Zhou, B., Xu, Z. and **Song, X.**, 2019. “*Hydrothermal-Assisted Transient Binder Jetting of Ceramics for Achieving High Green Density.*” JOM, pp.1-7.
- J18. **Song, X.**, He, L., Yang, W., Wang, Z., Chen, Z., Guo, J., Wang, H., Chen, L., 2019. “*Additive Manufacturing of Bi-continuous Piezocomposites with Triply Periodic Phase Interfaces for Combined Flexibility and Piezoelectricity.*” ASME Journal of Manufacturing Science and Engineering.
- J19. Alluri, R., **Song, X.**, Bougioukli, S., Pannell, W., Vakhshori, V., Sugiyama, O., Tang, A., Park, S.H., Chen, Y., Lieberman, J.R., 2019. “*Regional Gene Therapy with 3D Printed Scaffolds to Heal Critical Sized Bone Defects in a Rat Model.*” Journal of Biomedical Materials Research: Part A.
- J20. He, L., Fei, F., Wang, W., **Song, X.**, 2019. “*Support-Free Ceramic Stereolithography of Complex Overhanging Structures based on an Elasto-viscoplastic Suspension Feedstock.*” ACS Applied Materials & Interfaces.
- J21. Chen, Z., Qian, X., **Song, X.**, Jiang, Q., Huang, R., Yang, Y., Li, R., Shung, K., Chen, Y., and Zhou, Q., 2019. “*Three-Dimensional Printed Piezoelectric Array for Improving Acoustic Field and Spatial Resolution in*

Medical Ultrasonic Imaging.” Micromachines.

- J22. Yang, Y., **Song, X.**, Li, X., Chen, Z., Zhou, C., Zhou, Q., Chen, Y., 2018. “Recent Progress in Biomimetic Additive Manufacturing Technology: From Materials to Functional Structures.” *Advanced Materials*, 1706539.
- J23. He, L. and **Song, X.**, 2017. “Supportability of a High-Yield-Stress Slurry in a New Stereolithography-Based Ceramic Fabrication Process.” *JOM*, pp.1-6.
- J24. Ji, Y.Z., Wang, Z., Wang, B., Chen, Y., Zhang, T., Chen, L.Q., **Song, X.** and Chen, L., 2017. “Effect of Meso - Scale Geometry on Piezoelectric Performances of Additively Manufactured Flexible Polymer - $Pb(Zr_xTi_{1-x})O_3$ Composites.” *Advanced Engineering Materials*.
- J25. Yang, Y.#, Chen, Z.#, **Song, X.**.(Co-first author), Zhang, Z., Zhang, J., Shung, K.K., Zhou, Q. and Chen, Y., 2017. “Biomimetic anisotropic reinforcement architectures by electrically assisted nanocomposite 3D printing.” *Advanced Materials*, 2017, 29, 1605750. Featured on the **inside back cover**.
- J26. **Song, X.**, Zhang, Z., Chen, Z. and Chen, Y., 2017. “Porous Structure Fabrication Using a Stereolithography-based Sugar Foaming Method.” *ASME Journal of Manufacturing Science and Engineering*, 139(3), p.031015.
- J27. Wu, H., Liu, W., He, R., Wu, Z., Jiang, Q., **Song, X.**, Chen, Y., Cheng, L. and Wu, S., 2017. “Fabrication of dense zirconia-toughened alumina ceramics through a stereolithography-based additive manufacturing.” *Ceramics International*.
- J28. **Song, X.**, Chen, Z., Lei, L., Shung, K., Zhou, Q., Chen, Y., 2017. “Piezoelectric Component Fabrication Using Projection-based Stereolithography of Barium Titanate Ceramic Suspensions.” *Rapid Prototyping Journal*, 23(1).
- J29. Liu, W., Wu, H., Zhou, M., He, R., Jiang, Q., Wu, Z., Cheng, Y., **Song, X.**, Chen, Y. and Wu, S., 2016. “Fabrication of Fine-grained Alumina Ceramics by a Novel Process integrating Stereolithography and Liquid Precursor Infiltration Processing.” *Ceramics International*.
- J30. Wu, H., Cheng, Y., Liu, W., He, R., Zhou, M., Wu, S., **Song, X.** and Chen, Y., 2016. “Effect of the Particle Size and the Debinding Process on the Density of Alumina Ceramics Fabricated by 3D Printing based on Stereolithography.” *Ceramics International*.
- J31. Chen, Z.#, **Song, X.**.(Co-first author), Lei, L., Chen, Y., Zhou, Q., Shung, K., 2016. “3D Printing of Piezoelectric Element for Ultrasonic Sensing and Imaging.” *Nano Energy* 27: 78-86.
- J32. Zhou, M., Liu, W., Wu, H., **Song, X.**, Chen, Y., Cheng, L., He, F., Chen, S., Wu, S., 2016. “Preparation of a defect-free alumina cutting tool via additive manufacturing based on stereolithography –optimization of the drying and debinding processes.” *Ceramics International*.
- J33. Yang, Y.#, Chen, Z.#, **Song, X.** (Co-first author), Zhu, B., Wu, P., Xiong, R., Shi, J., Chen, Y., Zhou, Q., Shung, K., 2016. “Three-Dimensional printing of High Dielectric Capacitor using Projection based Stereolithography.” *Nano Energy*, 22: 414-421.
- J34. **Song, X.**, Chen Y., Lee, T.W., Wu, S., Cheng, L., 2015. “Ceramic Fabrication Using Mask-Image-Projection-based Stereolithography Integrated with Tape-casting.” *SME Journal of Manufacturing Processes*, doi:10.1016/j.jmapro.2015.06.022.

- J35. **Song, X.**, Pan, Y., Chen, Y., 2015. "Development of a Low-cost Parallel Kinematic Machine for Multi-directional Additive Manufacturing." ASME Journal of Manufacturing Science and Engineering, 137(2), 021005. doi: 10.1115/1.4028897.
- J36. Feng, Y., Cheng, J., **Song, X.**, Tan, J., 2014. "Robust engineering: improved inductive design exploration approach to bionic system." Materials Research Innovations. 18(s5), pp. s5-73-s5-75.
- J37. Feng, Y., Gao, Y., **Song, X.**, Tan, J., 2013." Equilibrium Design Based on Design Thinking Solving: An Integrated Multicriteria Decision-Making Methodology." Advances in Mechanical Engineering. 8, 27, doi:10.1155/2013/125291.
- J38. Feng, Y., **Song, X.**, Tan, J., Ding, L., 2012. "K-WFA based kinematic scheme design method of mechanical product." Journal of Zhejiang University (Engineering Science), 46(3), Mar. 515-523.

Referred Conference Proceedings (full paper):

- C1. Kirby, L., Fei, F., and **Song, X.**, "Characterization of Stress Shielding in Pressure-Assisted Ceramic Binder Jetting." ASME MSEC, 2022.
- C2. Fei, F., Kirby, L., and **Song, X.**, "Process Optimization for Hydrothermal-Assisted Jet Fusion Additive Manufacturing of Ceramics." ASME MSEC, 2022.
- C3. Guo, Z., Fei, F., **Song, X.**, Zhou, C., "Analytical Study of Shear-Thinning Fluid Flow in Direct Ink Writing Process." ASME MSEC, 2022.
- C4. Kirby, L., Fei, F., Wang, C., **Song, X.**, "Hydrothermal Assisted Transient Jet Fusion of Ceramics: A Test Case Using Bentonite Clay." Procedia Manufacturing, SME NAMRC 48, 2020.
- C5. Fei, F., He, L., Kirby, L., and **Song, X.**, "Study of Droplet Diffusion in Hydrothermal-assisted Transient Jet Fusion of Ceramics." ASME MSEC, 2020.
- C6. He, L., Fei, F., Wang, W., **Song, X.**, "Layerless Additive Manufacturing of Metal Alloy Components Using Immiscible-Interface Assisted Direct Metal Drawing." Procedia Manufacturing, SME NAMRC 47, Penn State Behrend, Erie, PA, 2019.
- C7. Fei, F., He, L., Zhou, B., Xu, Z. and **Song, X.**, "Hydrothermal-Assisted Transient Binder Jetting of Ceramics for Achieving High Green Density." 30th Annual International Solid Freeform Fabrication Symposium. August, Austin, Texas, 2019.
- C8. He, L., Fei, F., Wang, W., **Song, X.**, "Immiscible-interface Assisted Direct Metal Drawing." 29th Annual International Solid Freeform Fabrication Symposium. August, Austin, Texas, 2018.
- C9. He, Y., Fei, F., Wang, W., **Song, X.**, Sun, Z, Baek, S., "Predicting Manufactured Shapes Of A Projection Micro-Stereolithography Process Via Convolutional Encoder-Decoder Networks." ASME IDETC/CIE, 2018.
- C10. **Song, X.**, He, L., Yang, W., Wang, Z., Chen, L., "Co-continuous Piezocomposites With Triply Periodic Phase Interfaces For Enhanced Mechanical Flexibility and Piezoelectricity." The 13th Manufacturing Science and Engineering Conference of ASME (MSEC2018).
- C11. Chen, Z., Jiang, Q., **Song, X.**, Wang, K., Wu, S., Zhou, Q., Chen, Y., Shung, K., "Piezoelectric array for transducer application using additive manufacturing," 2017 IEEE International Ultrasonics Symposium (IUS), Washington, DC, 2017, pp. 1-4.

- C12. He, L., **Song, X.**, “*Supportability of A Highly Viscous Slurry in a New Stereolithography-based Ceramic Fabrication Process.*” 28th Annual International Solid Freeform Fabrication Symposium. August 7-9, Austin, Texas, 2017.
- C13. **Song, X.**, Zhang, Z., Chen, Z., Chen, Y., “*A Stereolithography-Based Sugar Foaming Method for Porous Structure Fabrication.*” The 11th Manufacturing Science and Engineering Conference of ASME (MSEC2016).
- C14. Li, X., Baldacchini, T., **Song, X.**, Chen, Y., “*Multi-Scale Additive Manufacturing: An Investigation on Building Objects with Macro-, Micro- and Nano-scales Features and Its Applications.*” The 11th International Conference on MicroManufacturing (ICOMM2016).
- C15. **Song, X.**, Chen, Y., Lee, T.W., Wu, S., Cheng, L., “*Ceramic Fabrication Using Mask-Image-Projection-based Stereolithography Integrated with Tape-casting.*” Proceedings of NAMRC/SME, NAMRC43-121, 2015.
- C16. **Song, X.**, Pan, Y., Chen, Y., “*Development of a Low-cost Parallel Kinematic Machine for Multi-directional Additive Manufacturing.*” 24TH Annual International Solid Freeform Fabrication Symposium. August 12-14, Austin, Texas, 2013.
- C17. **Song, X.**, Chen, Y., “*Joint Design for 3-D Printing Non-Assembly Mechanisms.*” ASME 2012 IDETC/CIE Conference, Paper Number: DETC2012-71528. Chicago, Illinois, 2012.

Selected Abstract/Posters (presentation only):

- A1. Fei, F., **Song, X.** “*Binder-free Additive Manufacturing of Ceramics Using Hydrothermal-assisted Transient Jet Fusion.*” 32nd Annual International Solid Freeform Fabrication Symposium. Austin, Texas, 2021.
- A2. Kirby, L., **Song, X.** “*Stress Shielding Effect during Compaction of a Selectively Variant Powder Bed in Hydrothermal-assisted Jet Fusion of Ceramics.*” 32nd Annual International Solid Freeform Fabrication Symposium. Austin, Texas, 2021.
- A3. Henprasert P, Dawson DV, El-Kerdani T, **Song X**, Couso-queiruga E, Holloway J.A.. “*Comparison of the Accuracy of Implant Position Using Surgical Guides Fabricated by Additive and Subtractive Techniques*”. American College of Prosthodontist meeting 2019.
- A4. **Song, X.**, He, L., Yang, W., Chen, Z., Chen, L.. “*Additive Manufacturing of Bi-continuous Piezocomposites based on Triply Periodic Micro-skeleton for Tailorable Hydrostatic Performance*”. 30th Annual International Solid Freeform Fabrication Symposium. Austin, Texas, 2019.
- A5. He, L., **Song, X.** “*Leveraging Temperature-dependent Rheological Behaviors of Ceramic Slurry for Support-free Fabrication*”. 29th Annual International Solid Freeform Fabrication Symposium. Austin, Texas, 2018.
- A6. **Song, X.**, He, L., Yang, W., Chen, Z., Chen, L.. “*Additive manufacturing of flexible 3-3 ferroelectric ceramic/polymer composite based on triply periodic cellular micro-skeleton*”. the 42nd International Conference and Exposition on Advanced Ceramics and Composites (ICACC 2018), Jan 22, 2018, Daytona Beach, Florida.
- A7. Chen, Z., **Song, X.**, Chen, Y., Shung, K.K. and Zhou, Q., 2017. *3D printing of piezoelectric transducer/array for ultrasonic imaging*. In Ultrasonics Symposium (IUS), 2017 IEEE International (pp. 1-1). IEEE.
- A8. Pannell, W., Bougioukli, S., **Song, X.**, Ortega, B., Sugiyama, O., Tang, A., Chen, Y., Lieberman, J.R.. “*Three Dimensionally Printed Calcium Phosphate Scaffolds with Gene Therapy for Difficult Bone Graft Scenarios in*

a Rodent Model". Poster accepted at: American Academy of Orthopaedic Surgeons Annual Meeting, March 14-17, 2017. San Diego, CA.

A9. **Song, X.**, He, L., Yang, W., Chen, Z., Chen, L.. “ *Additive Manufacturing of Flexible 3-3 Ferroelectric Ceramic/Polymer Composite Based on Triply Periodic Cellular Micro-skeleton*”. 28th Annual International Solid Freeform Fabrication Symposium. Austin, Texas, 2017.

INVITED TALKS

Seminar/Workshop:

- Selected speaker, “*Nature-inspired Additive Manufacturing of Ceramics with Significantly Reduced Carbon Emissions*,” NSF Workshop on Advanced Manufacturing for Industrial Decarbonization, Arlington, VA, 08/2023.
- Invited speaker, “*Ultra-low Temperature Additive Manufacturing of Ceramics*,” DoD Additive Manufacturing for Maintenance Operations Working Group (AMMO WG), 01/2023.
- Invited speaker, “*Additive Manufacturing of Energetic Composites*,” Naval Air Warfare Center Weapons Division, China Lake, 10/2022.
- Invited panelist, DoD DEPSCoR day (virtual), 06/2021.
- Graduate seminar, “*3D Printing of Bi-continuous Piezoelectric Composites with Tailorable Anisotropy*,” Department of electrical and computer engineering, University of Iowa, Iowa City, 12/03/2020.
- Graduate seminar, “*3D Printing of Bi-continuous Piezoelectric Composites with Tailorable Anisotropy*,” Department of chemical and biochemical engineering, University of Iowa, Iowa City, 10/22/2020.
- Graduate seminar, “*Achieving Geometric Complexity for Superior Functionality via Additive Manufacturing*,” industrial and manufacturing systems engineering, Iowa State University, Ames, Iowa, 03/06/2019.
- Graduate seminar, “*Achieving Complexity via Additive Manufacturing*,” mechanical engineering, the University of Iowa, Iowa City, Iowa, 09/28/2017.
- Graduate seminar, “*Extend Fabrication Capability of Additive Manufacturing Through a Slurry-based Stereolithography Process*,” industrial engineering, the University of Iowa, Iowa City, Iowa, 09/22/2016.

Conference:

- Invited speaker, “*Hydrothermal-assisted Jet Fusion: A Selective Cold Sintering Approach*,” Materials Science & Technology, Columbus, OH, 10/2023.
- Invited speaker, Workshop on “Advanced Manufacturing of Flexible Electronics and Nondestructive Testing for Quality Assurance”, IISE 2022 Annual Conference.
- Invited speaker, “*Binder-free Additive Manufacturing of Ceramics Using Hydrothermal-assisted Jet Fusion*,” ACS Spring 2022.
- Invited speaker, “*Additive Manufacturing of Bicontinuous Piezocomposites for Tailorable Hydrostatic Performance*,” 8th International Congress on Ceramics, Virtual, Korea, 2021.

- Invited speaker, “A *Suspension-Enclosing Projection-stereolithography Process for Complex Ceramic Component Fabrication without Building Support Structures*,” Materials Science & Technology, Columbus, OH, 2018.

P A T E N T S

- **Song, X.**, He, L., “Immiscible-Interface Assisted Direct Metal Drawing”, U.S. Patent No. 11,413,688, 2022.
- **Song, X.**, He, L., “Support-free Additive Manufacturing of Ceramics, ” U.S. Patent No. 10,751,909, 2020.
- Lieberman, J.R., Pannell, W., Chen, Y., **Song, X.** and Bougioukli, S., 2020. Growth factor transduced cell-loaded ceramic scaffold for bone regeneration and repair. U.S. Patent Application 16/337,893.
- **Song, X.**, Fei, F., Kirby, L., “Hydrothermal-assisted Transient Binder Jetting,” US Provisional Patent Application, 2019.
- Zhu, J., Wang, Z., **Song, X.**, Hu, R.C., Mortazavi, M., 2017. “*Multiple Disk Loader Apparatus*”, U.S. Patent 9,799,367.

S T U D E N T M E N T O R I N G

In Progress:

Ph.D. Students:

- A. Bill Bangel, starting in fall 2021.
- Jackson Berlage, starting in fall 2023.
- Nazanin Tabatabaei, starting in spring 2024.

Undergraduate Students:

- Diego Robles, starting in fall 2023.
- Alejandro Mirafuentes, starting in fall 2023.
- Tram Le, starting in fall 2022.
- Jake Atzen, starting in spring 2023.
- Alexander Gralczyk, starting in spring 2023.
- Luke Striegel, starting in spring 2023.

Completed:

Ph.D. Students:

- Levi Kirby, “*Pressure-Assisted Additive Manufacturing of Energetic Composites: Processing Science and Applications.*” 01/2019-07/2023 (Comp in 01/2023, Defense in 06/2023). Now working as an assistant instructional professor in mechanical engineering at the University of Wyoming.

- Fan Fei, “*Hydrothermal-Assisted Jet Fusion: A Binder-Free Additive Manufacturing Approach for Ceramics.*” 08/2017-07/2022 (Comp in 11/2021, Defense in 07/2022). Now working as a R&D engineer at Align Technology, San Jose, CA.
- Li He, “*Suspension-enclosing Projection Stereolithography of Bi-continuous Piezoelectric Ceramic Composites.*” 08/2016-05/2020 (Comp in 12/2019, defense in 04/2020). Now working as the director of the 3DP Research Institute at Guangdong FHZL Tech Co., Ltd, China.

Master Students:

- Wenbo Wang, “*Multi-scale Micro-projection Based Stereolithography for Microneedle Fabrication: Process Development and Optimization.*” 2018-2019 (Defense in 11/2019). Now PhD student at ASU.

Undergraduate Students:

- Alan E Jr Meyer, industrial engineering, spring 2023.
- Prabhav Bhatt, mechanical engineering, fall 2021-spring 2023.
- Xin Lyu, mechanical engineering, fall 2021-fall 2022.
- Thiago Xifra, mechanical engineering, spring 2022-fall 2022.
- Logan Hammond, industrial engineering, spring 2022.
- Alexander Dotzler, mechanical engineering, fall 2019-spring 2020.
- Liyan Liu, mechanical engineering, spring 2020.
- Ryan Dauzvardis, industrial engineering, fall 2018– spring 2019.
- Justin Hoehne, electrical engineering, Sep.2018 ~ Dec. 2018.
- Baizhuang Zhou, mechanical engineering, spring 2018- spring 2019.
- Ziyang Xu, mechanical engineering, summer 2018– spring 2019.
- Qiwei Zhu, mechanical engineering, spring 2017 –fall 2017.
- Genevieve Goelz, biomedical engineering, spring 2018–fall 2018.
- Lamis Awdi, industrial engineering, fall 2017 –fall 2018.
- Oliver Stroh, industrial engineering, University Honors program, 01/2017-05/2017.
- Iris Ryu, Gonzalo Gambino, Tae Woo Lee, Reese Dorrepaal, Sirosh Selina, Kennedy Stine, industrial and systems engineering, USC, before 2016.
- Andrew Davidson, mechanical engineering, Brigham Young University, before 2016.
- Zaid Badwan, mechanical engineering, National Autonomous University of Mexico UNAM, Mexico, before 2016.

Summer Interns:

- Xuan (Kevin) Yang, McCallie School (Tennessee), K-12 SSTP program, June. 2023 ~ July. 2023.
- Kevin Su, Heritage High School (Texas), K-12 SSTP program, June. 2022 ~ July. 2022.
- Yash Fichadia, Millard North High School (Nebraska), K-12 SSTP program, June.2019 ~ July.2019.
- Haoran Wu, West Senior High School (Iowa), June.2019 ~ August.2019.
- Junkai Wu, No.2 High school of East China Normal University, K-12 SSTP program, June.2018 ~ July.2018.

Visiting Scholar:

- Xiaofeng Li, Wuhan University, 01/2020 – 01/2021.

KEY AWARDS FOR SUPERVISED STUDENTS

- 2022, Levi Kirby, Biles, Parsaei and Zaloom Endowed Scholarship, IISE
- 2022/2021, Levi Kirby, 3MT College of Engineering Finalist, University of Iowa
- 2022, Bill Bangel, Graduate Best Poster Award at COE Research Open House, University of Iowa
- 2022, Prabhav Bhatt, Undergraduate Best Poster Award at COE Research Open House, University of Iowa
- 2021, Levi Kirby, selected to 23rd National School on Neutron and X-ray Scattering, ORNL and ANL
- 2020, Levi Kirby, E. Wayne Kay Graduate Scholarship – PhD, SME
- 2019, Wenbo Wang and Li He, Graduate Best Poster Award at COE Research Open House, University of Iowa
- 2018, Fan Fei and Wenbo Wang, Graduate Best Poster Award at COE Research Open House, University of Iowa
- 2017, Fan Fei, Dean’s Fellowship, University of Iowa

THESIS COMMITTEE

Ph.D. Thesis Committee:

- Thesis Examination for Hum Jun Wee Allen, Nanyang Technological University, Sigapore, “In-process monitoring of selective laser sinterin,” 12/2023
- Prarthana Parepalli, “Effects of reaction kinetics models on macro-scale sensitivity predictions for a wide class of energetic materials,” chair: Prof. H.S. Udaykumar, 10/2023.
- Parth Kotak, “Artificial Muscles for Soft Robotics and Underwater Applications,” chair: Prof. Caterina Lamuta, 05/2023.
- Yusen He, “Learning Geometric Descriptors using Convolutional Encoder-decoder Networks,” chair: Prof. Steve Baek, 09/2020.
- Xudong Zhang, “New Functional Depths and Applications,” chair: Prof. Yong Chen, 04/2020.

- Sidhartha Roy, “Structure-Property-Performance Linkage Using Machine Learning Based Multiscale Models for Shocked Heterogeneous Materials,” chair: Prof. H.S. Udaykumar, 04/2020.
- Zhiyu Sun, “*Deep Learning on Curved Surfaces: Manifold-Formulation of Convolutional Neural Networks and its Operations*,” chair: Prof. Steve Baek, 11/2019.

Ph.D. Comprehensive Exam Committee:

- Shobhan Roy, “Numerical Framework for High-fidelity Mesoscale Computations of Shock Initiation in HMX-based PBXs,” chair: Prof. H.S. Udaykumar, 12/2023.
- Joy (Jimin) Kim, “Driver’s Mental Model Assessment on ADAS After the Over-the-Air Update,” chair: Prof. Daniel McGehee, 11/2023.
- Parth Kotak, “Artificial Muscles for Soft Robotics and Underwater Applications,” chair: Prof. Caterina Lamuta, 09/2022.
- Yusen He, “Learning Geometric Descriptors Using Convolutional Encoder-Decoder Networks,” chair: Prof. Steve Baek, 05/2019.
- Xudong Zhang, “New Functional Depths and Applications,” chair: Prof. Yong Chen, 05/2019.
- Sidhartha Roy, “Structure-Property-Performance Linkage Using Machine Learning Based Multiscale Models for Shocked Heterogeneous Materials,” chair: Prof. H.S. Udaykumar, 03/2019.
- Zhiyu Sun, “Deep Learning on Curved Surfaces: Manifold-Formulation of Convolutional Neural Networks and its Operations,” chair: Prof. Steve Baek, 11/2018.

M.S. Thesis Committee:

- Amit Unnadkat, “*Sintering Effect on Zirconia Manufactured by Suspension Enclosed Projection Stereolithography*,” chair: Prof. Erica Teixeira, 03/2023.
- Pantip Henprasert, “*Comparison of the Accuracy of Implant Surgical Guides Fabricated by Additive and Subtractive Techniques*,” chair: Prof. Julie A. Holloway, 07/2019.
- Zachary Nolte, “*Mosquito Popper: A Multiplayer Online Game for 3D Human Body Scan Data Segmentation*,” chair: Prof. Steve Baek, 03/2017.

TEACHING

Undergraduate-level Courses:

- ISE 2360/ENGR2760 Design for Manufacturing, University of Iowa
- IE4650/IE5650 Mechatronics Engineering for Smart Device Design, University of Iowa

Graduate-level Courses:

- IE5310 Advanced Computational Design and Manufacturing, University of Iowa
- IE5620 Design of Experiments, University of Iowa

- IE6810 Advanced Topics on Additive Manufacturing, University of Iowa

OUTREACH

- 11.2021 Host of 3D printing day for Iowa blind school
- 01.2019 Speaker at the outreach speaking event for the Iowa City school district (North Central Jr High)
- 2018, 2019 Mentor of the Secondary Student Training Program (SSTP) at the Belin-Blank Center
- 03.2018 Host of the lab tours for the regional Junior Sciences and Humanities Symposium (JSHS)
- 02.2017 Mentor of a team of blind and visually impaired students in the “2017 First Robotics Competition”

SERVICE ACTIVITIES

Professional Level:

Proposal Review:

- 2023 Proposal reviewer for NASA
- 2022 Proposal reviewer for International Space Station National Lab (NASA-CASIS)
- 2022 Invited reviewer for the NSF Graduate Research Fellowship Program (GRFP)
- 2021 Proposal reviewer for Army Research Office
- 2020 Proposal reviewer, U.S.-Israel Binational Science Foundation.
- 2019 Proposal reviewer, the Marsden Fund, New Zealand.
- 2019 Proposal reviewer, DOE.
- 2017- Proposal review panelist, the National Science Foundation.
- 17/19 Proposal reviewer, Swiss National Science Foundation.
- 2017 Proposal reviewer, Kazakhstan National Centre of Science and Technology Evaluation.

Editorial Roles/Symposium Organizer:

- 2023- Editorial Board Member, *npj Advanced Manufacturing*.
- 2024 Symposium organizer, “Additive Manufacturing of Ceramics and Composites,” ACerS PACC-FMAs 2024.
- 2023 Scientific committee, the 2023 World Congress on Micro and Nano Manufacturing (WCMNM 2023), Evanston, IL, USA

- 07.2022 Guest editor, Micromachines, special issue on ‘the future of micro additive manufacturing technologies.’
- 06.2021 Guest editor, Ceramics, special issue on additive manufacturing of ceramic-based materials
- 2020-2021 Topic board members, Crystals journal.
- 2020- Symposium organizer, “Additive Manufacturing of Ceramic-based Materials: Process Development, Materials, Process Optimization and Applications,” MS&T.
- 2020-2022 Symposium organizer, “Symposium on Additive Manufacturing of Ceramics, Concretes, and Composites,” ASME MSEC.
- 06.2019 Session chair, ASME MSEC 2019.
- 2019-2020 Technical program committee, UrbCom 2019, 2020
- 08.2017 Session chair, SFF symposium.
- 06.2017 Session co-organizer, ASME MSEC 2017.
- 06.2017 Session chair, SME NAMRC Track 4 “Cyber-Physical Systems in Manufacturing”.
- 08.2016 Session co-organizer, ASME IDETC 2016 “Design for Sustainable Additive Manufacturing”.

Journal Review:

SME Journal of Manufacturing Processes, SME Journal of Manufacturing Systems, ASME Journal of Manufacturing Science and Engineering, ASME Journal of Computing and Information Science in Engineering, ASME Journal of Mechanical Design, ASME Journal of Micro- and Nano-Manufacturing, IISE Transactions, Rapid Prototyping Journal, Additive Manufacturing, 3D Printing and Additive Manufacturing, Advanced Materials, Advanced Functional Materials, Advanced Engineering Materials, Materials & Design, Materials Today Communications, Materials Chemistry and Physics, Journal of the American Ceramic Society, Journal of the European Ceramic Society, Ceramics International, International Journal of Applied Ceramic Technology, Journal of Asian Ceramic Societies, PLOS ONE, Tissue Engineering, Journal of Biomedical Materials Research Part A, Procedia CIRP, Medical Devices and Sensors, Composites Part B: engineering, Composite Interfaces, Polymers, Macromolecular Materials and Engineering, Research, ASM Handbooks, Advanced Composite Materials, Measurement, Materials, SN Applied Sciences, Cogent Business & Management, ACS Applied Polymer Materials, ACS Applied Engineering Materials, Materials Chemistry and Physics, Mechanics of Materials, Virtual and Physical Prototyping, Advanced in Manufacturing, Soft Robotics, Nano energy, etc..

Conference Proceeding Review:

NAMRC/MSEC, ASME IDETC/CIE, Solid Freeform Fabrication Symposium, International Symposium on Flexible Automation, International Conference on Innovative Design and Manufacturing (ICIDM), ASME International Mechanical Engineering Congress & Exposition (IMECE), etc.

University/College/Department Level:

- 2023-2024 Chair, Faculty search committee
- 08.2023-present ISE director of graduate studies

- 2021-2023 ISE director of graduate admission
- 08.2021-present ISE DEI committee
- 10.2018-present ISE Design and Manufacturing EFA coordinator, UIowa
- 09.2018-2020 Faculty mentor of Iowa 3D Club, UIowa
- 2018-2020 ISE Undergraduate Committee
- 2018-2019 ISE Faculty Search Committee
- 2017-2018 MIE Lecturer Search Committee
- 2016-2018 Design for Manufacturing (DFM) Course Committee
- 2016-2017 IE program secretary