Nathan J. Huft, PhD, PE, CWI, CWEng

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EDUCATION

Ph.D., Materials Science GPA 3.91/4.0 **2019**
Montana Technological University, Butte, MT
Dissertation Title: *Investigation of Multiple Torch PAW-Based Additive Manufacturing*
Research Advisor: Dr. R. Bruce Madigan

M.S., General Engineering, Welding Engineering Emphasis GPA 4.0/4.0 **2012**
Montana Tech of The University of Montana, Butte, MT
Thesis Title: *Heat Transfer in GTA Welding Arcs*
Research Advisor: Dr. R. Bruce Madigan

B.S, Metallurgical Engineering GPA 3.88/4.0 **2010**
South Dakota School of Mines and Technology, Rapid City, SD

SUMMARY OF SKILLS

- Licensed professional engineer (PE) in Montana
- American Welding Society Certified Welding Inspector (CWI) and Certified Welding Engineer (CWEng)
- Proficient with computers including engineering software such as SolidWorks, Solid Edge, COMSOL Multiphysics, SOLIDCast, and FLOWCast
- Excellent written and verbal communication skills, including teaching.
- In-depth knowledge of metallurgy, specifically pertaining to investment casting, heat treatment, failure analysis, and welding
- Experienced with a variety of industrial and laboratory equipment including robotic manipulators, vacuum furnaces, welders, induction and arc melters and associated instrumentation
- Proficient in weld inspection and nondestructive testing, including penetrant, radiographic, magnetic particle, and ultrasonic testing methods
- Proficient with arc welding and machine tool operation and troubleshooting
- Experienced with numerous alloys including steel, stainless, Inconel, René, cobalt, and titanium alloys

RESEARCH INTERESTS

- Welding, physical, and mechanical metallurgy
- Alloy characterization and development
- Solidification behavior
- Metal additive manufacturing, especially wire and arc methods
- Welding processes and applications
- Numerical Modeling

PROFESSIONAL EXPERIENCE

Associate Professor **July 2024-Present**
Assistant Professor **Aug. 2020-June 2024**
Department of Mechanical Engineering, Montana Technological University, Butte, MT

- Teach engineering courses, including fluid mechanics and welding engineering courses
- Lead the mechanical engineering department's welding engineering focus area
- Provide service to the department, campus, and community by participating in on-campus committees, advising student clubs, and through community organizations such as 4H
- Conduct research related to welding, materials science, and additive manufacturing, managing approximately $1.5 million of research funds annually

Project Hire Materials Engineer **Feb. 2020-Aug. 2020**
Idaho National Laboratory, Idaho Falls, ID

- Conducted and documented research projects involving welding, additive manufacturing, and materials characterization

Part-Time Foundry Engineer **Aug. 2015-Jan. 2020**
Montana Precision Products, Butte, MT

- Assisted engineering team on as-needed basis, especially with Nadcap Heat Treat Audit preparation, heat treating-related troubleshooting, and equipment maintenance

Adjunct Faculty **Aug. 2015-Dec. 2019**
Montana Technological University, Butte, MT

- Taught welding metallurgy, introduction to welding engineering, and statics courses

Graduate Research Assistant **Aug. 2015-May 2019**
Montana Technological University, Butte, MT

- Researched metal additive manufacturing techniques including wire and arc and laser powder bed methods

Foundry Engineer **May 2012-Aug. 2015**
Montana Precision Products/SeaCast of Montana, Butte, MT

- Performed product and process engineering for foundry producing aerospace and commercial product lines, including steel, stainless, nickel-alloy, and titanium castings
- Directed vacuum heat treating operations, including obtaining initial Nadcap accreditation.
- Supervised pyrometry in accordance with AMS 2750
- Created and maintained work instructions for foundry and heat treating processes
- Provided engineering support for selecting, purchasing, installing, and maintaining equipment, including shell dipping robots, and VIM, VAR, and vacuum heat treating furnaces
- Developed and qualified welding procedures for stainless, nickel, cobalt, and titanium alloys to AWS D17.1 and ASME BPVC
- Modeled solidification in castings to reduce rework labor and losses

Engineering Intern **May 2011-May 2012**
SeaCast of Montana, Butte, MT

- Designed and fabricated various fixtures, shop aids, and plant equipment to support foundry and tube and duct fabrication manufacturing operations

Graduate Teaching Assistant **Aug. 2010-May 2012**
Montana Tech of The University of Montana, Butte, MT

- Taught fluid mechanics labs and welding metallurgy course

May 2010-Aug. 2010

PUBLICATIONS, PATENTS, AND CONFERENCE PRESENTATIONS

- Bikash Mahato, Jay Yoder, Gloyd Simmons, **Nathan Huft**, Isaac Nault, Peter Lucon (2025). Particle dynamics in low-pressure cold spray additive manufacturing–A numerical and experimental study. *Additive Manufacturing*, 104937.
- Bikash Mahato, Jay Yoder, Gloyd Simmons, **Nathan Huft**, Isaac Nault, and Peter Lucon (2024). Investigation of particle dynamics in a low-pressure cold spray additive manufacturing process. In *77th Annual Meeting of the American Physical Society Division of Fluid Dynamics*. Salt Lake City, UT, November 2024.
- Bikash Mahato, Jay Yoder, Gloyd Simmons, **Nathan Huft**, Isaac Nault, and Peter Lucon (2024). Numerical and experimental investigation of particle dynamics in cold spray additive manufacturing process. In *International Mechanical Engineering Congress & Exposition* (IMECE). Portland, OR, November 2024.
- Bikash Mahato, Jay Yoder, Katelyn Rapp, Gloyd Simmons, **Nathan Huft**, Isaac Nault, and Peter Lucon. Particle dynamics of a low-pressure cold spray system. In *14th Cold Spray Action Team Meeting*. Worcester, MA, June 2024.
- L. Holly, B. Pramanik, **N. Huft**, J. Madison, Methods of Welding Casing Subjected to Impulsive Loading, in *68th Congress of Indian Society of Theoretical and Applied Mechanics (ISTAM 2023)*, Dec. 2023.
- R. L. McNabb, P. A. Lucon, **N. J. Huft**, and T. O. Winsor, "Dry Metal Alloying Compositions and Related Methods," US Patent US-11794242-B2. Issued Oct. 24, 2023.
- S. Hanson, K.V. Sudhakar, **N. Huft**, P.A. Lucon, J. Lucon, D. Jacintho. Evaluation of SLM Parameters for Producing Elementally Homogeneous Printed Products Using Novel Dry Metal Alloy (DMA) Powder Feedstock. Presented at TMS 2023 Annual Meeting and Exhibition, March 19-23, 2023, San Diego, CA.
- P. Lucon, **N. Huft**. Update: Dry Metal Alloy Mixing and Capabilities. Presented at the 8th Annual Energetics RAM Users Forum, March 7-8, Indian Head, MD.
- P. Lucon, **N. Huft**. Dry Metal Alloy Mixing and Capabilities. Presented at the 7th Annual Energetics RAM Users Forum, May 10-11, 2022, Rapid City, SD.
- T.M. Lillo, **N.J. Huft**, D.E. Clark, M.V. Glazoff, and J.A. Simpson, "Novel Aspects of multi-Wire Arc Additive Manufacturing for Large Component Fabrication for Extreme Environments and New Alloy Discovery," presented at the 2021 TMS Annual Meeting, March 15-18, 2021.
- K. Sudhakar, L. George, and **N. Huft**, "Analysis of failure mechanisms in a planetary gear," International Engineering Journal – IENJ, Vol. 1, No. 1, pp. 5-13, January 2013.

LICENSES AND CERTIFICATIONS

- Montana Professional Engineer, License Number PEL-PE-LIC-90413
- American Welding Society Certified Welding Inspector, Number 25091931
- American Welding Society Certified Welding Engineer, Number 2509000G
- Investment Casting Institute Certified Investment Casting Specialist
- Level 1 Leave No Trace Instructor

SOCIETIES AND SERIVCE

- Faculty Advisor, Montana Tech American Welding Society Student Chapter (2021-Present)
- Faculty Advisor, Montana Tech Society of Automotive Engineers Baja Club (2020-Present)
- Chair, American Welding Society Adams Memorial Award Committee (2022-Present)
- Member, American Foundry Society (2023-Present)
- Member, American Welding Society (2010-Present)
- Member, The Minerals, Metals, and Materials Society (2017-Present)
- Member, National Eagle Scout Association (2004-Present)
- Reviewer, NASA EPSCoR R3 Proposals (2023)
- Reviewer, US DOE Nuclear Energy Office of Science FY2021 Small Business Innovation Research (SBIR) Phase I Release 1 (2021)
- Judge, 2021 Montana Tech Regional Science and Engineering Virtual Fair

HONORS AND AWARDS

- 2024 Montana Technological University Faculty Merit Award
- 2023 Montana Technological University Faculty Achievement Award
- 2021 South Dakota School of Mines and Technology Outstanding Recent Graduate Award
- Boy Scouts of America Eagle Scout Rank
- Order of the Arrow Vigil Honor
- 2006 *Argus Leader* Academic All-Star