Nathan Spike

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CURRENT APPOINTMENT

University of Wisconsin - Stout, Menomonie, Wisconsin, USA

- Assistant Professor - Engineering and Technology — Aug 2021 – Present
- Courses Taught:
  - ETECH 202 - Welding and Casting Processes
  - ETECH 253 - Joining and Casting Processes
  - ENGR 275 - Thermodynamics and Heat Transfer

EDUCATION

Michigan Technological University, Houghton, Michigan, USA

- PhD in Mechanical Engineering - Engineering Mechanics — Aug 2016 – Aug 2021
  - Research in autonomous vehicle dynamics and controls focusing on lateral vehicle control, path planning, and simulation - hardware correlation for low friction environments.
- Master of Science in Mechanical Engineering - Engineering Mechanics — Aug 2016 – May 2019
- Graduate Certificate in Post-Secondary STEM Education — Aug 2016 – May 2019

Saint Cloud State University, Saint Cloud, Minnesota, USA

- BS in Mechanical Engineering — Jan 2012 – May 2016

Wisconsin Indianhead Technical College, New Richmond, Wisconsin, USA

- Technical Diploma in welding — Aug 2009 – May 2010

PREVIOUS TEACHING EXPERIENCE

Michigan Technological University, Houghton, Michigan, USA

- Guest Lecturer - Introduction to Robotics — Jan 2019 – May 2019
  - Delivered a series of lectures to a graduate robotics course covering topics in mobile robot kinematics including kinematic models and constraints, maneuverability, degrees of freedom, and motion control.
- Graduate Teaching Assistant - SAE AutoDrive Challenge — Aug 2017 – Present
  - Graduate mentor for the Michigan Tech team competing in the SAE AutoDrive Challenge.
- Summer Youth Program - Instructor — May 2017 – Aug 2017
- Graduate Teaching Assistant - Mechanical Engineering - Engineering Mechanics — Aug 2016 – May 2017
  - Lab instructor for Mechanical Engineering Practice 1, a sophomore level engineering lab course covering topics including data acquisition, product dissection, materials testing, 2 dimensional finite element analysis, and simulation.
  - Lab instructor for Mechanical Engineering Practice 4, a junior level engineering lab course covering topics including experimental methods, simulation, data processing, comparing experimental and analytical results, and engineering communication methods.

Saint Cloud State University, Saint Cloud, Minnesota, USA

- Tutor - Math Skills Center — Aug 2012 – May 2016

PROFESSIONAL EXPERIENCE

Elk River Machine Company, Elk River, Minnesota, USA

- Operational Excellence Intern — Jun 2016 – Aug 2016

Independent Consulting at Saint Cloud State University, Saint Cloud, Minnesota, USA

- Research Consultant — May 2015 – Dec 2015

C4 Welding, Sauk Rapids, Minnesota, USA

- Engineering Intern — Jun 2014 – Jun 2015

Despatch Industries, Lakeville, Minnesota, USA

- Welder/Fabricator — Sep 2010 – Oct 2011

PUBLICATIONS

JOURNALS

[1] N. Spike, D. Chopp, A. Kurup, J. Bos, and D. Robinette, "Cross Track Compensated Pure Pursuit Control of an Autonomous Vehicle on Low Friction Surfaces," *SAE International Journal of Connected and Automated Vehicles* 4, no.2 2021.

[2] N. Spike, D. Chopp, A. Kurup, J. Bos, and D. Robinette, "Optimizing Maneuver Length for Autonomous Obstacle Avoidance Maneuver with Considerations for Controllability and Passenger Comfort on Low Friction Surfaces," (In Press, 2021)

CONFERENCES

[3] D. Chopp,N. Spike, J. Bos, and D. Robinette, "Multi point pure pursuit," In *Autonomous Systems: Sensors, Processing, and Security for Vehicles and Infrastructure 2020*, (Vol. 11415, p. 1141505). International Society for Optics and Photonics, May 2020.

[4] J. Bos, D. Chopp, A. Kurup, and N. Spike, "Autonomy at the end of the Earth: an inclement weather autonomous driving data set," In *Autonomous Systems: Sensors, Processing, and Security for Vehicles and Infrastructure 2020*, (Vol. 11415, p. 1141507). International Society for Optics and Photonics, May 2020.

[5] J. Naglak, C. Greene, C. Majhor, N. Spike, J. Bos,and W. Weaver, "Autonomous Power Grid Formation for Surface Assets Using Multiple Unmanned Ground Vehicles," In *2020 IEEE Aerospace Conference*, (pp. 1-8). IEEE, Mar 2020.

[6] N. Spike, J. Bos, J. Beard, and D. Robinette, "Wheel alignment effects on autonomous vehicle control vs human driver in simulation," In *Autonomous Systems: Sensors, Processing, and Security for Vehicles and Infrastructure 2019*, (Vol. 11009, p. 110090C). International Society for Optics and Photonics, May 2019.

AWARDS & SCHOLARSHIPS

- Outstanding Graduate Student Teaching Award - Spring 2017
  For gaining the recognition of students and faculty for excellent performance and exceptional ability as a teacher.