

Nicholas A. Goberville

Connected and Automated Vehicle Research Engineer

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OVERVIEW

Research engineer with a focus on software and systems architecture—especially where software interacts with the real world. Most of my work sits at the intersection of automation, simulation, and physical systems—whether that’s integrating hardware, developing control interfaces, or creating tools that make complex systems easier to test and deploy. I care about building things that are reliable, understandable, and useful to the people who use them, and I enjoy tackling problems that require both big-picture thinking and low-level technical detail.

EDUCATION

Western Michigan University

Ph.D. Mechanical Engineering

Dissertation: “Cost-Effective Enablement of Automated Driving Systems on Snow-Covered Roads”

Kalamazoo, MI

May 2018 – Apr 2022

Western Michigan University

B.S.E. Mechanical Engineering & Minor in Mathematics, GPA 3.62/4.0

Cum Laude honors, Tau Beta Pi inductee, and recipient of MI-LSAMP 2018 summer research grant

Kalamazoo, MI

Aug 2015 – Apr 2019

INDUSTRY AND RESEARCH EXPERIENCE

Argonne National Laboratory

Connected and Automated Vehicle Research Engineer

Lemont, IL

Jan 2022 – Present

- Led the scope and vision for CAV activities of the \$6 million U.S. Department of Energy’s (DOE) EcoCAR EV Challenge program in collaboration with General Motors, Mathworks, and the U.S. DOE.
- Designed a standard communication interface for Vehicle-in-the-Loop (VIL) dynamometer testing used to evaluate the energy consumption of automated longitudinal control features, e.g., Adaptive Cruise Control (ACC).
- Guided 200+ graduate/undergraduate students from 13 university teams to develop Cooperative ACC, Lane Centering Control (LCC), and Automatic Intersection Navigation and integrate into a 2023 Cadillac LYRIQ.
- Actively contributed to six DOE research projects involving topics such as V2X, digital twins, sensor characterization, vehicle testing, and more, aligning outcomes with DOE’s mission of transportation efficiency.

Revision Autonomy LLC

Co-Founder

Kalamazoo, MI

Nov 2019 – Jan 2022

- Won over \$215,000 in program and research development funding.
- Led a team of 3 to complete 150+ customer discovery interviews to define a commercialization path for perception software targeting the automotive market.
- Developed a camera-based tire track detection system for snow-covered roads, using collected & labelled dataset.

Western Michigan University

Adjunct Professor

Kalamazoo, MI

Jan 2022 – Apr 2022

- Taught Control Systems course to 70 undergraduate students, receiving a feedback score of 4.3/5 from students.

Graduate Research Assistant

May 2018 – Apr 2022

- Developed HD mapping software using Mobileye lane detections and cm-level precision GPS waypoints along 140 miles of highway in Michigan.
- Provided 20+ students with disabilities last-mile mobility using two low-speed autonomous shuttles.
- Integrated a camera-based, simulation-trained reinforcement learning lane detection model onto a physical vehicle for end-to-end lateral control.

NOTABLE PROJECTS

Longitudinal Automated Replay System (LARS) Architect

Argonne National Laboratory | Jan 2025 – Present (Ongoing)

- Developed a modular and vehicle-agnostic system enabling repeatable lead vehicle behavior during automated controller testing across proving grounds.
- Designed and deployed on multiple platforms including a 2024 Cadillac Lyriq and 2023 Toyota Prius Prime using comma.ai override systems.
- Validated LARS during DOE AVATAR-funded testing at GM Milford Proving Grounds and GM Desert Proving Grounds, enabling cross-platform controller benchmarking.
- Supports plug-and-play integration of any ACC controller using the FlexIL vehicle interface and standardized bus architecture.
- Skills: Controls, vehicle networking (CAN/CAN FD), simulink, vehicle testing, software architecture

VIL Design for the EcoCAR EVC California Air Resources Board Dynamometer Testing Event

Argonne National Laboratory | May 2024 - Apr 2025 | [See Article](#)

- Designed IPv4 networking for sensor fusion object injection enabling standard VIL test across 13 vehicles.
- Effectively documented encoder/decoder to university teams for 100% integration into their software stacks.
- Successfully conducted closed-loop test at ANL using a Cadillac LYRIQ provided by GM with 0 packet loss.
- Skills: Analog Signals, Vehicle Testing, Computer Networking (UDP), Dynamometer Testing, Controls

Sensor Fusion & Connectivity Checks Test Lead for EcoCAR EVC Year 2 Competition

Argonne National Laboratory | Jan 2024 - May 2024

- Led the development of testing procedures, evaluation metrics, and a scoring system for university-designed sensor fusion systems.
- Streamlined data post-processing by providing a DBC which defined the bit-packing and data rates teams needed to report, saving over 6 hours of time typically required for scoring.
- Successfully standardized the integration of stock and added sensors across 13 university teams, ensuring data accuracy and cybersecurity compliance.
- Achieved a testing precision of <0.01cm using OxTS RTK units, significantly enhancing system reliability.
- Skills: Sensor fusion, cybersecurity, vehicle networking (CAN/CAN FD), V2X, RTK

Tire Track Identification: Data Pipeline & ML Model Training

Western Michigan University | Nov 2019 - Dec 2021 | [See Journal Publication](#)

- Curated data pipeline of 1,500 unique images from 20 hours of data logging utilizing python and the GCP API.
- Managed the data cleaning & labelling process for feeding into the ML pipeline using CVAT.
- Achieved 0.83mIoU using a decision trees model trained with gray-scale pixels and pixel locations.
- Skills: Python, Machine Learning, GCP, OpenCV, ROS, Camera, CVAT

AWARDS & RECOGNITIONS

- Impact Argonne Award for CARB CAV Testing & XIL Deployment (2025)
- Impact Argonne Award for Collaborative Vehicle Testing Effort (2024)
- Laboratory Directed Research Development (LDRD) Innovate Awardee at Argonne National Laboratory (2023)
- University of Michigan Translational Research and Commercialization Awardee (2021)
- National Science Foundation Innovation Corps Summer Cohort 3 (2020)
- Michigan Translational Research and Commercialization Grants (2020 & 2021)
- Recipient of “MAE Graduate Research and Creative Scholar Award” (2021-2022)

TECHNICAL SKILLS

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| • <u>Sensors</u> : Camera, LiDAR, V2X radio | • <u>Coding</u> : Python, Matlab, C++ | • <u>Networking</u> : UDP, CAN, CANFD |
| • <u>Cloud Services</u> : GCP and AWS | • <u>OS</u> : Linux & Windows 10/11 | • <u>Algorithms</u> : Computer Vision & Controls |
| • <u>UX/UI</u> : PyQt, Tkinter, Dash | • <u>Middleware</u> : ROS 1/2 and RTMaps | • <u>Other</u> : Automation, cybersecurity, protobuf |
| • <u>Version Control</u> : Git | • <u>Simulators</u> : CARLA, AURILEON, Roadrunner, Simulink | |
| • <u>Data Processing</u> : 3D, Images | | |

SELECTED PATENTS & PUBLICATIONS

Asher ZD, **Goberville NA**, Kadav P (2024). Automation in Inclement Weather. US Patent Application US20240140479A1, United States Patent and Trademark Office.

Goberville NA, Hamilton K, Di Russo M, Jeong J, Das D, Ord D, Misra P, Crain T (2025). Modular Dynamometer Testing Framework to Evaluate Energy Impacts of Longitudinal Automated Driving Systems. **SAE Technical Paper**. DOI: 10.4271/2025-01-8065

Hamilton K, Misra P, Ord D, **Goberville NA**, Crain T, Marwadi S (2025). Portable Track-Based Connected Intersection Testing System for Connected and Automated Vehicles. **SAE Technical Paper**. DOI: 10.4271/2025-01-8062

Goberville NA, Prins KR, Kadav P, Walker CL, Siems-Anderson AR, and Asher ZD (2023) Snow Coverage Estimation Using Camera Data for Automated Driving Applications. **Transportation Research Interdisciplinary Perspectives 18**. DOI: 10.1016/j.trip.2023.100766

Kadav P, **Goberville NA**, Prins KR, Walker CL, Siems-Anderson AR, and Asher ZD (2023) Road Snow Coverage Estimation Using Camera and Weather Infrastructure Sensor Inputs. **SAE Technical Paper**. DOI: 10.4271/2023-01-0057

Goberville NA, Ahmed S, Iliev S, and Pervan B (2023) Automated Vehicle Perception Sensor Evaluation in Real-World Weather Conditions. **SAE Technical Paper**. DOI: 10.4271/2023-01-0056

Goberville NA, Kadav P, and Asher ZD (2022) Tire Track Identification: A Method for Drivable Region Detection in Conditions of Snow-Occcluded Lane Lines. **SAE International Journal of Advances and Current Practices in Mobility 4** (5): 1590–97. DOI: 10.4271/2022-01-0083

Brown NE, Rojas JF, **Goberville NA**, Alzubi H, AlRousan Q, et. al. (2022) Development of an Energy Efficient and Cost Effective Autonomous Vehicle Research Platform. **MDPI - Sensors 22(16)**, 5999. DOI: 10.3390/s22165999

Vivan GP, **Goberville N**, Asher Z, Brown N, Rojas J (2021) No Cost Autonomous Vehicle Advancements in CARLA through ROS. **SAE Technical Paper**. DOI: 10.4271/2021-01-0106

Goberville N, El-Yabroudi M, Omwanas M, Rojas J, Meyer R, Asher ZD, Abdel-Qader I (2020) Analysis of LiDAR and Camera Data in Real-World Weather Conditions for Autonomous Vehicle Operations. **SAE International Journal of Advances and Current Practices in Mobility**, V129-99EJ. DOI: 10.4271/2020-01-0093

Navarro A, Genc S, Rangarajan P, Khalil R, **Goberville N**, Rojas J, Asher ZD (2020) Using Reinforcement Learning and Simulation to Develop Autonomous Vehicle Control Strategies. **SAE Technical Paper**. DOI: 10.4271/2020-01-0737

Omwanasa M, Meyer R, Asher ZD, **Goberville N** (2020) Observer for Faulty Perception Correction in Autonomous Vehicles. **SAE Technical Paper**. DOI: 10.4271/2020-01-0694

SELECTED PRESENTATIONS & PANEL DISCUSSIONS

Nick Goberville (2025) Modular Dynamometer Testing Framework to Evaluate Energy Impacts of Longitudinal Automated Driving Systems. **SAE World Congress Experience**. Detroit, Michigan. *Presenter*.

Nick Goberville, Elliot Huangfu, Shobhit Gupta, Arun Kumar Verma, and Sanyogeeta Lawande (2024) Revolutionizing Electrified Mobility with Autonomy & Connectivity. **IEEE Transportation Electrification Conference & Expo**. Rosemont, IL. *Panelist*.

Nick Goberville (2024) Demonstration of EcoCAR EV Challenge & dSPACE Sponsorship. **dSPACE USA User Conference**. Detroit, Michigan. *Presenter*.

Nick Goberville, Curtis Walker, Greg McGuire, Leslie Keaveney, and Rob Heilman (2023) Weather, Automated Vehicles, and Society. **American Meteorological Society Washington Forum**. Washington D.C. *Panelist*.

Nick Goberville (2022) Introduction and Scope for CAV Activities in the 2022-2026 DOE EcoCAR EV Challenge. **EcoCAR EVC Launch Workshop**. Washington D.C. *Presenter*.

Nick Goberville, Mahendra Kute, Dennis Winslow, Phil Magney (2021) Michigan Mobility Connect CAV Seasonal Tech Demo. **American Center for Mobility**. Ypsilanti, MI. *Panelist*.

Nick Goberville, Marjava Petri, Harri Santamala, Jay Meldrum (2021) Seeing the Road Ahead: Advancing Mobility in All Seasons. **Michigan Office of Future Mobility and Electrification**. Detroit, Michigan. *Panelist*.

Nick Goberville (2020) Analysis of LiDAR and Camera Data in Real-World Weather Conditions for Autonomous Vehicle Operations. **SAE World Congress Experience**. Detroit, Michigan. *Presenter*.

Nick Goberville, Lalitha Dabbiru, Wing Ti Pao, Sumanth Dadam (2020) Technical Expert Panel Discussion: ADAS and AD Localization, Sensing and Perception. **SAE World Congress Experience**. Detroit, Michigan. *Panelist*.