Nicholas E. Civitanova

Staff Consultant

Mr. Nicholas Civitanova is a Mechanical Engineer and a Staff Consultant for Engineering Systems Inc (ESi) in the Aurora, Illinois office. He has a Bachelor of Science in Mechanical Engineering from Purdue University in West Lafayette, Indiana. Mr. Civitanova specializes in accident investigation and reconstruction of recreational, passenger, and commercial vehicles with expertise in impact analysis, vehicle dynamics, instrumentation, data acquisition and analysis, and three-dimensional laser scanning. Mr. Civitanova has experience with biomechanical instrumentation, incorporating the use of motion capture technologies to measure and visualize biological motion.

Licenses & Certifications

- State of Illinois P.E. License

Positions Held

Engineering Systems Inc., Aurora, IL

- Staff Consultant, 2023-present

Engineering Systems Inc., Ann Arbor, MI

- Engineering Intern, 2021 - 2022

Publications

“Sensitivity Analysis of Virtual Crash Simulation Software Using Design of Experiments (DOE),”
Roberts, J., **Civitanova, N.**, Stegemann, J., Buzdygon, D., and Thobe, K. SAE International, SAE Technical Paper, 2025. 2025-01-8693, doi:10.4271/2025-01-8693.

“Inclusion of Tire Forces into Low-Speed Bumper-to-Bumper Crash Reconstruction Simulation Models,”
Brach, M., Stegemann, J., Manuel, E.J., and **Civitanova, N.** SAE International, SAE Technical Paper, 2024. 2024-01-2479, doi:10.4271/2024-01-2479.

Presentations

“Sensitivity Analysis of Virtual Crash Simulation Software Using Design of Experiments (DOE),”
Co-Presenter, SAE WCX, Detroit, MI, April 8-10, 2025.

Nicholas E. Civitanova
Staff Consultant

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ESi
4215 Campus Dr.
Aurora, IL 60504

Education
B.S., Mechanical Engineering, Purdue University, West Lafayette, IN, 2022

Areas of Specialization
Accident Investigation and Reconstruction

Vehicle Dynamics Analysis and Simulation

Data Collection

Vehicle Systems Analysis

"Inclusion of Tire Forces into Low-Speed Bumper-to-Bumper Crash Reconstruction Simulation Models"

Co-Presenter, SAE WCX, Detroit, MI, April 16-18, 2024.

Continuing Education, Short Course Lectures Presented

- **Applying Automotive EDR Data to Traffic Crash Reconstruction** - SAE Certificate of Achievement, June 2025
- **The Fundamentals of Vehicle Dynamics** - SAE Certificate of Achievement, April 2025
- **Driver Distraction from Electronic Devices: Insights and Implications** - SAE Certificate of Achievement, April 2025
- **Traffic Crash Reconstruction for Engineers** - Northwestern University Center for Public Safety, Aurora, IL, January 2024
- **Recon – 3D Training Course** - Certificate of Completion, December 2023
- **Virtual Crash Simulation Basics Training** - Certificate of Training, November 2023
- **Virtual Crash Interface Training** - Certificate of Training, November 2023
- **Event Data Recorder Update and Analysis** - Ruth Consulting, September 2023
- **Bosch CDR Tool Technician Training** - Certificate of Training, April 2023
- **FARO Focus 3D Operator** - Certificate of Training, Aurora, IL, 2023

Professional Affiliations

- **Society of Automotive Engineers (SAE)** - Member
- **American Society of Mechanical Engineers (ASME)** - Member

Project Experience

Investigations

Vehicle Impact Analysis – Vehicle to Vehicle

- Performed inspection of the site and involved vehicles and captured data in the forms of photographs, videos, three-dimensional laser scan data, and event data recorder information.
- Analyzed the vehicle collision to determine area of impact and orientation at impact.
- Performed a momentum analysis to determine speed at impact and energy of the impact.
- Performed a time-distance analysis to determine the coordinated motion of each vehicle. Analyzed available avoidance of each vehicle under specific conditions.

Vehicle Impact Analysis – Vehicle to Pedestrian

- Performed inspection of the site and involved vehicles and captured data in the forms of photographs, videos, three-dimensional laser scan data, and event data recorder information.
- Analyzed the vehicle and pedestrian's post impact motion to determine impact location
- Performed a momentum analysis to determine the vehicle's speed at impact.

Vehicle Dynamics Simulation

- Modelled vehicle motion using physical principles and 3D dynamics simulation software.
- Applied known vehicle capabilities to determine speed, position, and/or maneuverability.
- Produced visuals to illustrate the general motion of the vehicle.