

# STEPHANIE ROSSMAN

PhD, PE

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## BIOMECHANICS | TRAFFIC ACCIDENT RECONSTRUCTION

### EDUCATION

#### LAWRENCE TECHNOLOGICAL UNIVERSITY

**PhD** Mechanical Engineering 2021

#### WAYNE STATE UNIVERSITY

**MS** Biomedical Engineering 2014

#### MERCER UNIVERSITY

**BS** Biomedical Engineering 2008

### LICENSES & CERTIFICATIONS

Professional Engineer FL  
#87924

Professional Engineer MI  
#6201063487

Professional Engineer IL  
#062.070405

Certified Crash Data Retrieval (CDR)  
Technician and Analyst, Bosch/Vetronix

Remote Pilot Certification, Federal  
Aviation Administration, #4202260

### AFFILIATIONS

SAE International

American Society of Biomechanics

## PROFESSIONAL PROFILE

*Dr. Stephanie Rossman's* major practice area involves the scientific investigation of accidents resulting in traumatic injury, with specific expertise in collision reconstruction and biomechanical analysis. She is a licensed Professional Engineer, a trained Crash Data Retrieval (CDR) technician and analyst, and a certified drone pilot. Dr. Rossman has experience performing inspection and 3D laser scans of automobiles, collision sites, and work areas.

*Dr. Rossman* holds a B.S. in Biomedical Engineering from Mercer University, a M.S. in Biomedical Engineering from Wayne State University, and a Ph.D. in Mechanical Engineering from Lawrence Technological University, focusing on spine biomechanics and failure analysis. Dr. Rossman's doctoral research included developing a biomechanical computer model of the spine and investigating the biomechanics of intervertebral disc herniations.

## AREAS OF EXPERTISE

Biomechanics

Injury causation analysis

Low-speed vehicle collision severity and injury analysis

Vehicle accident reconstruction

Passenger vehicle EDR downloads

Evidence preservation

Scene and vehicle damage documentation

Computer simulation, modeling, and graphics

Biomechanical computational simulation

## EXPERIENCE

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### Explico

2020 - Present *Managing Engineer*  
2017 - 2020 *Senior Engineer*  
2014 - 2017 *Associate Engineer*

### Armstrong Forensic Engineers

2013 - 2014 *Associate Engineer*

### Quest Engineering and Failure Analysis, Inc.

2012 - 2013 *Associate Engineer*  
2008 - 2010

### Amos P. Godby High School

2010 - 2012 *Mathematics Teacher*

## PEER-REVIEWER MANUSCRIPTS

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Stephanie Rossman, Eric Meyer & Steve Rundell (2021) Development of a finite element lumbar spine model to predict intervertebral disc herniation risk factors, Computer Methods in Biomechanics and Biomedical Engineering, DOI: 10.1080/10255842.2021.1922677

Vo H.V., Rossman S., Flucker Z., and Radharamanan R. Comparison of Shear Stress Acting in the Sockets of Typical Mobile and Immobile Ankle Prostheses Using Finite Element Analysis (FEA). American Society for Engineering Education, March 2008.

## DOCTORAL DISSERTATION

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Biomechanics of Intervertebral Disc Herniation: In Silico Examinations of Spinal Decompression Surgery and Its Effects on Intervertebral Disc Herniation Risk. Dissertation. Lawrence Technological University. 2021.

## PRESENTATIONS AND PUBLISHED ABSTRACTS

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Demma D., Rossman, S., Johns N., Rundell S. Validation of Steering Wheel Forces and Upper Extremity Loading During Rear-End Collisions using MADYMO. Summer Biomechanics, Bioengineering and Biotransport Conference, 2023.

Rossman S, Meyer E, Isaza J, Rundell S. Physiological Loading Conditions to Simulate Standing. Summer Biomechanics, Bioengineering and Biotransport Conference, 2021. Podium Presentation.

Demma D, Button K, Kappler E, Rossman S, Rundell S. A Strategy for Validating the Kinematics of a Vehicle-Specific MADYMO Model of a Low-Speed Rear-End Collision. Summer Biomechanics, Bioengineering and Biotransport Conference, 2021.

Rossman S. The Importance of Posterior Muscle Strength and Facet contact in Reducing Disc Herniation Risk. Lawrence Technological University Research Day, 2021.

Rossman S, Meyer E, Rundell S. The Contribution of Spinal Erector Muscle Strength and Facet Contact in Reducing Disk Herniation Risk During Forward Bending. American Society of Biomechanics Conference, 2020.

Rossman S, Meyer E, Rundell S. The Importance of Spinal Erector Muscle Strength and Facet Contact in Establishing Sagittal Balance and Reducing Disc Loads During Standing and Forward Bending. American Society of Biomechanics Conference, 2020.

Rossman S, Meyer E, Rundell S. Development of a Finite Element Lumbar Spine Model to Predict Intervertebral Disc Herniation Risk. XXVII Congress of the International Society of Biomechanics held in conjunction with the 43rd Annual Meeting of the American Society of Biomechanics, 2019.

Sproule D, Rossman S, Snyder P, Button K, Weaver B, Rundell S. Biomechanical Analysis of a Low Speed Rear-End Collision Using a Subject-Specific MADYMO Simulation. XXVII Congress of the International Society of Biomechanics held in conjunction with the 43rd Annual Meeting of the American Society of Biomechanics, 2019.

Sproule D, Rossman S, Snyder P, Button K, Weaver B, Rundell S. Subject-Specific MADYMO Analysis of a Low-Speed Rear-End Collision. Summer Biomechanics, Bioengineering and Biotransport Conference, 2019.

Rossman S, Sproule D, Button K, Weaver B, Rundell S. Intervertebral Disc Herniation Risk During Low-Speed Lateral Collisions. 8th World Congress of Biomechanics, 2018.

Rossman S, Sproule D, Button K, Weaver B, Rundell S. Intervertebral Disc Herniation Risk During Low-Speed Lateral Collisions. American Society of Biomechanics Conference, 2018.

Sproule D, Rossman S, Button K, Weaver B, Rundell S. Simulation of Occupant Kinematics in Low-Speed Lateral Collisions using Articulated Total Body.

**PhD, PE**

Sproule D, Rossman S, Button K, Weaver B, Rundell S. Simulation of Occupant Kinematics in Low-Speed Lateral Collision using Articulated Total Body. American Society of Biomechanics Conference, 2018.

Button K, Rossman S, Weaver B, Rundell S. Cervical Spine Forces and Disc Herniation Risk During Standardized Rear-End Impact Testing. Summer Biomechanics, Bioengineering and Biotransport Conference, 2016.

## PROFESSIONAL DEVELOPMENT

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### **Altair**

*Introduction to RADIOSS for Impact*

*Introduction to HyperMesh & HyperView*

### **American Society of Civil Engineers**

*Application of Clear Zones*

*Designing Bicycle Facilities*

*Designing Residential Streets*

*Improving Highway Safety: An Overview of Nine Proven Crash Countermeasures*

*Improving Pedestrian Safety at Uncontrolled Locations*

*Reducing Collision at High Crash Locations*

*Safety Aspects of Timing Signals*

*Sight Distance*

*Traffic Control Devices*

*Traffic Signal Design*

### **Bosch / Vetronix**

*Crash Data Retrieval (CDR) Certified Technician Course*

*Crash Data Retrieval (CDR) Data Analyst Course*

### **Dart Drones**

*Basic Flight Training*

### **Engineering Society of Detroit**

*Principles and Practice of Engineering Review Course*

### **FARO Technologies**

*Laser Scanning Training with SCENE*

### **Leica Geosystems**

*Basic Training Course*

**PhD, PE**

## **Michigan Association of Traffic Accident Investigators**

*Fall 2014 Training Conference*

## **Motorcycle Safety Foundation**

*Basic Rider Course*

## **National Safety Council**

*CPR Course*

*First Aid Course*

## **Northwestern University Center for Public Safety**

*Traffic Crash Reconstruction 3*

## **Remote Pilot 101**

*FAA Unmanned Aircraft General Examination Preparatory Course*

## **Siemens PLM**

*MADYMO Introduction Training*

## **Society of Automotive Engineers**

*Accessing and Interpreting Heavy Vehicle Event Data Recorders*

*Apply Automotive EDR Data to Traffic Crash Reconstruction*

*Fundamentals of Vehicle Dynamics*

*Injuries, Anatomy, Biomechanics and Federal Regulation*

*Photogrammetry and Analysis of Digital Media*

*Vehicle Crash Reconstruction: Principles and Technology*

## **SRR Training**

*ACTAR Examination Preparatory Course*

## **Other**

*Motor Vehicle Accident Reconstruction, Crash Analysis and Crash Testing*

*CDR Download Applied Field Training*

*Practical Vehicle Dynamics and Tire Mark Interpretation*

*Aerial Work Platform Training*

## **PROFESSIONAL SERVICE**

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Guest Lecturer, Forensic Biomechanics, Lawrence Technological University, 2019

Guest Lecturer, Introduction to Biomedical Engineering, Lawrence Technological University, 2019