

DOMINIC DEMMA

MS

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BIOMECHANICS

EDUCATION

WAYNE STATE UNIVERSITY		
PhD	Biomedical Engineering - Injury Biomechanics	In Progress
MS	Biomedical Engineering - Injury Biomechanics	2022
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN		
BS	Bioengineering	2019
BS	Chemistry	2019

LICENSES & CERTIFICATIONS

Engineer in Training (EIT) Certification - NCEES

FAA Certified Drone Pilot - IACRA Registered, 2020

Lightpoint Scientific Advanced Photomodeler for Collision Reconstruction, 2019

SIEMENS MADYMO 7.7 Basic Course, 2019

AFFILIATIONS

SAE International

Kappa Theta Tau

Biomedical Engineering Society (BMES)

PROFESSIONAL PROFILE

Mr. Dominic Demma specializes in forensic injury biomechanics, which involves investigating and reconstructing incidents resulting in traumatic injury. He holds a B.S. in Bioengineering and a B.S. in Chemistry from the University of Illinois at Urbana-Champaign. During his studies, Mr. Demma developed computational models of human physiological systems, designed finely engineered tissues using advanced biofabrication and gene editing techniques, and managed a capstone project that prototyped a surgical device for a physician at the Carle Foundation Hospital's Heart Vascular Institute.

He also holds an M.S. in Biomedical Engineering, specializing in Injury Biomechanics, from Wayne State University and is pursuing a Ph.D. in Biomedical Engineering with a focus on traumatic head and brain injury also at Wayne State University.

As a Senior Scientist at Explico, Mr. Demma manages and consults on the technical aspects of a wide variety of cases. His responsibilities include conducting inspections and physical tests, reviewing leading scientific literature, and analyzing incident-related documents to understand the scenario or question at hand. He then uses state-of-the-art reconstruction and 3D modeling techniques to create accurate accident reconstructions and visualizations. His primary role at Explico involves advancing biomechanics analyses using Finite Element and Multi-Body Simulations, particularly in areas such as impact biomechanics and vehicle collision occupant dynamics. Mr. Demma continually enhances his technical and investigative research skills and actively pursues new methods in researching injury biomechanics, including studies using Finite Element modeling to predict and prevent complex, severe brain injuries.

Prior to joining Explico, Mr. Demma conducted research on synthetic tissue drug testing platforms at the University of Pennsylvania. At the University of Illinois, he specialized in cutting-edge biomedical engineering methodologies and represented the university by teaching a cell and tissue engineering laboratory.

AREAS OF EXPERTISE

Simulation Biomechanics
Accident Reconstruction using UAVs/Drones, Laser Scanning, and Photogrammetry
Simulating Vehicle Accident Dynamics
Research in Injury Biomechanics and Tissue Engineering

EXPERIENCE

Explico

2024 - Present *Senior Scientist*
2019 - 2023 *Scientist*

Cell and Tissue Engineering Lab

2017 - 2019 *Lab Assistant*

University of Pennsylvania - Center for Engineering Mechanobiology

2018 *Internship sponsored by the NIH*

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Computational Modeling of Human Physiology
Principles of system analysis and body system modeling

Biofabrication, Bio-bots, and CRISPR gene editing
Designed biomedical devices using CAD design and 3D printing
Genetically engineered synthetic tissues

Senior Capstone Project and Presentation
Utilized principals for engineering and design to produce a marketable prototype for a client at the Carle Foundation Hospital's Heart Vascular Institute

WAYNE STATE UNIVERSITY COURSES

Accident Reconstruction
Vehicle Safety Engineering
Musculoskeletal Biomechanics
Impact Biomechanics & Advanced Topics in Impact Biomechanics
Applied Finite Element Methods in Biomechanical Analyses
Biomechanics of Blast Injury

AWARDS

James Honors Scholar, 2015 - 2019

University of Illinois College of Engineering Dean's List, 2015 - 2019

Illinois Engineering Achievement Scholarship

Professional Scholarship, Wayne State University, 2021

PRESENTATIONS AND PUBLISHED ABSTRACTS

Lynch D., Verner K., Demma D., Rundell S. Development of a Subject-Specific MADYMO Model Predictive of Tibial Plateau Fractures in a High Speed Frontal Collision. World Congress Biomechanics Conference, 2026.

Verner K., Lynch D., Demma D., Rundell S. Effectiveness of Restraint Use in Reducing Lower-Extremity Injury Severity During High-Speed Frontal Collisions: A Case Study Utilizing MADYMO. World Congress Biomechanics Conference, 2026.

Podium Presentation at the 69th Stapp Car Crash Conference - Computational Injury Biomechanics, 2026

Demma DR, Rossman SM, Johns NA, Rundell SA. 2023. Validation of Steering Wheel Forces and Upper Extremity Loading During Rear-End Collisions Using MADYMO [Abstract #113]. In 2023 Summer Biomechanics, Bioengineering, and Biotransport Conference, 344-45. Vail, CO.

Poster Presentation at the 2023 Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C2023) - Vail, CO.

Jeffs SB, Demma DR, Petroskey KJ, Bland ML, Rundell SA. "Computational Simulation of Sideswipe Collisions to Predict Head Injury Metrics." XXVIII Congress of the International Society of Biomechanics, Stockholm, Sweden, 2021.

Podium presentation at the 2021 Summer Biomechanics, Bioengineering, and Biotransport Conference (Sb3C2021) - Brain and Injury Mechanics: Kinematics

Demma DR, Button KD, Kappler EH, Rossman SM, Rundell SA. A Strategy for Validating the Kinematics of a Vehicle-Specific Madymo Model of a Low-Speed Rear-End Collision [Abstract #239]. Proceedings of the Summer Biomechanics, Bioengineering and Biotransport Conference; 2021 June 14-18; Virtual Conference: Sb3C; 2021.

Guest lecture presentation on Forensic Engineering at Lawrence Technological University (2019)

Senior Capstone Project poster session and final presentation (2019)

National Conference for the Center for Engineering Mechanobiology (2018)

PEER REVIEWED PUBLICATIONS

Blanco A, Mahajan T, Coronado RA, Ma K, Demma DR, Dar RD. Synergistic Chromatin-Modifying Treatments Reactivate Latent HIV and Decrease Migration of Multiple Host-Cell Types. *Viruses*. 2021; 13(6):1097. <https://doi.org/10.3390/v13061097>

Demma D., Tao Y., Zhang L., and Prasad, P., "Proposed Reformulation of Brain Injury Criteria (BrIC) Using Head Rotation-Induced Brain Injury Thresholds Simulated and Derived from A Subhuman Primate Finite Element Model," *Stapp Car Crash Journal*. 69(1):51-81, 2025, <https://doi.org/10.4271/2025-22-0003>