

Joseph M. Cormier PhD PE

Curriculum Vitae

Education

Ph.D.	Biomedical Engineering Virginia Tech – Wake Forest School of Biomedical Engineering and Sciences Research focus: Facial Biomechanics	2009
M.S.	Mechanical Engineering with Biomedical Engineering Option Virginia Polytechnic Institute and State University Research focus: Thoracic Biomechanics	2003
B.S.	Mechanical Engineering New Mexico Institute of Mining and Technology	2001

Continuing Education

Machine Learning Foundations University of Washington on Coursera	2019
Applied Machine Learning in Python University of Michigan on Coursera	2017
Crash Data Retrieval (CDR) User's Summit Houston, Texas	2012
ARAS360 Advanced 3D Computer Diagramming and Animation for Incident Reconstruction San Antonio, Texas	2011
EDSMAC - Simulations Training Course Engineering Dynamics Corporation	2011
ARC-CSI Crash Conference Las Vegas, NV	2010
Brain Injury Symposium NHTSA Docket # 26249	2007
Current Issues in Using Crash Injury Data	2006

SAE Professional Development Program, Detroit MI	
Automotive Safety and Injury Biomechanics Blacksburg Virginia	2005
Applied Nonlinear Statistical Methods San Antonio American Statistical Association	2005
Traffic Accident Reconstruction I & II Northwestern University Traffic Institute, Evanston, Illinois	2003

Professional Experience

BIOCORE Senior Research Scientist Charlottesville, Virginia	2016-Present
Consultant Biodynamic Research Corporation San Antonio, Texas	2009-2017
Technical Director Biodynamic Research Corporation San Antonio, Texas	2003-2009
Graduate Research Assistant Impact Biomechanics Laboratory Virginia Tech	2001-2003
Research Assistant Psychology Department New Mexico Institute of Mining and Technology	2000
Research Assistant Environmental Engineering Department New Mexico Institute of Mining and Technology	1999-2000

Appointments

Adjunct Assistant Professor Biomedical Engineering University of Texas at San Antonio	2012 – 2016
Adjunct Assistant Professor School of Biomedical Engineering and Sciences	2010 – Present

Virginia Tech – Wake Forest

Clinical Faculty
United States Air Force School of Aerospace Medicine
Graduate Medical Education

2010 – 2016

Professional Activities

Licensed Professional Engineer
Texas No. 104932
Virginia No. 0402056752

2009 - Present
2018 - Present

Accredited Traffic Accident Reconstructionist (#2170)
Accreditation Commission for Traffic Accident Reconstruction

2009 – 2019

Reviewer Accident Analysis and Prevention
 Journal of Biomechanics
 Annals of Biomedical Engineering
 Society of Automotive Engineers
 Traffic Injury Prevention

Professional Societies

Biomedical Engineering Society

2010-Present

Association for the Advancement of Automotive
Medicine

2002-Present

Society of Automotive Engineers

2002-Present

Honors and Awards

Award of Appreciation
Resident in Aerospace Medicine - United States Air Force
School of Aerospace Medicine

2010

Paul E. Torgerson Research Excellence Award:
Master's Category in Mechanical Engineering
Virginia Tech

2003

Impact Biomechanics Lab Outstanding Research Award
Virginia Tech

2002-2003

Center for Biomedical Engineering Symposium:
Outstanding Researcher Award

2001-2002

Publications

Journal Publications

McMurry TL, Cormier JM, Daniel T, Scanlon JM, Crandall JR: An Omni-Directional Model of Injury Risk in Planar Crashes with Application for Autonomous Vehicles; *Traffic Injury Prevention*: 2021.

Lessley DJ, Kent RW, Cormier JM, Sherwood CP, Funk JR, Crandall JR, Myers BS, Arbogast KB: Position-Specific Circumstances of Concussions in the NFL: Toward the Development of Position-Specific Helmets; *Annals of Biomedical Engineering*: October; 2020.

Bailey AM, McMurry TL, Cormier JM, Funk JR, Crandall JR, Mack CD, Myers BS, Arbogast KB: Comparison of Laboratory and On-Field Performance of American Football Helmets; *Annals of Biomedical Engineering*: October; 2020.

Kent R, Forman J, Bailey A, Cormier J, Park G, Crandall J, Arbogast KB, Myers B: Surface Contact Features, Impact Obliquity, and Preimpact Rotational Motion in Concussive Helmet-to-Ground Impacts: Assessment *via* a New Impact Test Device; *Annals of Biomedical Engineering*: September; 2020.

Lessley DJ, Kent RW, Funk JR, Sherwood CP, Cormier JM, Crandall JR, Arbogast KB, Myers BS: Video Analysis of Reported Concussion Events in the National Football League During the 2015-2016 and 2016-2017 Seasons. *Am J Sports Medicine*: 46(14); 2018.

Cormier J; Gwin L; Reinhart L; Wood R, and Bain C: A Comprehensive Review of Low-Speed Rear Impact Volunteer Studies and a Comparison to Real-World Outcomes. *Spine* 43; 2018.

Funk J, Watson R, Cormier J, Guzman H, Bonugli E: Kinematics and Kinetics of Vigorous Head Shaking, *J. Applied Biomechanics* 31(3): 2015.

Cormier J, Freund M, Bonugli E, Guzman H: Passenger Car Response to Interaction with Tractor-Trailer Steer Tire Lugs, *SAE Int. J. Commercial Vehicles* 7(1): 2014.

Bonugli E, Wirth J, Funk J, Cormier J, Guzman E, Gwin L, Freund M: Characterization of Force Deflection Properties for Vehicular Bumper-to-Bumper Interactions, *SAE Int. J. Transportation Safety* 2(1): 2014.

Funk JR, Cormier JM, Bain CE, Wirth JL, Bonugli EB, Watson RA, "Factors Affecting Ejection Risk in Rollover Crashes," *Annals of Advances in Automotive Medicine.*, 56:203-211, 2012.

Funk J, Cormier J, Manoogian S: Comparison of Risk Factors for Cervical Spine, Head, Serious and Fatal Injury in Rollover Crashes, *Accident Analysis & Prevention*, 45: 67-74; 2012.

Cormier J, Manoogian S, Bisplinghoff J, Rowson S, Santago A, McNally C, Duma S, Bolte J: The Tolerance of the Maxilla to Blunt Impact, *J Biomech Eng*, 133(6); 2011.

Cormier J, Manoogian S, Bisplinghoff J, Rowson S, Santago A, McNally C, Duma S, Bolte J: The Tolerance of the Frontal Bone to Blunt Impact, *J Biomech Eng*, 133(2), 021004; 2011.

Duma SM, Cormier JM, Hurst WJ, Stitzel JD, Herring IP: Experimental Analysis of Airbag Seam Design: High-Rate Shear Testing for Skin Abrasions, *Journal of Automobile Eng*; 2011.

Funk JR, Cormier JM, Bain CE, Guzman H, Bonugli E, Manoogian SJ: Head and Neck Loading in Everyday Vigorous Activities, *Annals of Biomedical Engineering*, 2010.

Scott W, Bain C, Manoogian S, Cormier J, Funk J: Simulation Model for Low-Speed Bumper-to-Bumper Crashes, SAE 2010-01-0051, *SAE Int. J. Passeng. Cars – Mech. Syst.*, 3(1): 21-26; 2010.

Cormier J, Manoogian S, Bisplinghoff J, Rowson S, Santago A, McNally C, Duma S, Bolte J: Biomechanical Response of the Human Face and Corresponding Biofidelity of the FOCUS Headform, *SAE Int. J. Passeng. Cars – Mech. Syst.*, 3(1): 842-859; 2010.

Cormier J, Manoogian S, Bisplinghoff J, Rowson S, Santago A, McNally C, Duma S, Bolte J: The Tolerance of the Nasal Bone to Blunt Impact, *Annals of Advances in Automotive Medicine*, 54: 2010.

Cormier J, Manoogian S, Bisplinghoff J, Rowson S, Santago A, McNally C, Duma S, Bolte J: Biomechanical Response of the Human Face and Corresponding Biofidelity of the FOCUS Headform, SAE 2010-01-1317, Society of Automotive Engineers Congress, Detroit, MI; 2010.

Raddin J, Cormier J, Smyth B, Croteau J, Cooper E: Compressive Neck Injury and its Relationship to Head Contact and Torso Motion during Vehicle Rollovers, *SAE Int. J. Passeng. Cars – Mech. Syst.*, 2(1): 914-41; 2009.

Cormier, JM, Duma, SM: Epidemiology of Facial Fractures in Automotive Collisions, *Annals of Advances in Automotive Medicine*, 53, 2009.

Funk, JR, Cormier, JM, Gabler, HC: Effect of Delta-V Errors in NASS of Frontal Crash Risk Calculations, *Annals of Advances in Automotive Medicine*, 52: 155 – 164, 2008.

Cormier JM: The Influence of Body Mass Index on Thoracic Injuries in Frontal Impacts, *Accident Analysis and Prevention*, 40: 610-15; 2008.

Kennedy EA, Hurst WJ, Stitzel JD, Cormier JM, Hanzen GA, Smith EP, Duma SM: Lateral and Posterior Dynamic Bending of the Mid-Shaft Femur: Fracture Risk Curves for the Adult Population, *Proceedings of the Stapp Car Crash Conference, 2004-22-0002*; 2004.

Hurst WJ, Cormier JM, Stitzel JD, Jernigan MV, Moorcroft DM, Herring IP, Duma SM: A New Methodology for Investigating Airbag-Induced Skin Abrasions, *J. Proc. IMechE: Automotive Engineering*, 219(D): 599-605; 2005.

Duma S, Cormier J, Hurst W, Stitzel J, Herring I: The Effects of Seam Design on Airbag Induced Skin Abrasions From High-Rate Shear Loading. *Proceedings of the International Research Conference of the Biomechanics of Impact (IRCOBI)*, Lisbon, Portugal, September 2003.

Stitzel, JD, Cormier, JM, Barretta, JT, Kennedy, EA, Smith, EP, Rath, AL, Duma, SM. "Defining Regional Variation in the Material Properties of Human Rib Cortical Bone and its Effect on Fracture Prediction." *Proceedings of the 47th International Stapp Car Crash Conference*, San Diego, California, 2003.

Stitzel JD, Duma SM, Cormier JM, Herring IP: A Nonlinear Finite Element Model of the Eye with Experimental Validation for the Prediction of Globe Rupture. *Proceedings of the 46th Stapp Car Crash Conference, Society of Automotive Engineers*, Ponte Vedra Beach, FL: 02S-58; 2002. (Winner, John Paul Stapp Award for best paper of 2002: "Your paper entitled... was voted by the members of the Stapp Advisory Committee as the paper that makes the most significant contribution to the field of impact biomechanics related to the reduction of injuries in automotive transportation.")

Conference Publications

Cormier J, Funk J, Beuchamp G, Pentecost D: Pycrash: An Open-Source Tool for Accident Reconstruction, SAE Technical Paper 2021-01-0896; 2021.

Bonugli E, Cormier J, Reilly M, and Reinhart L: Replicating Real-World Friction of Motorcycle Helmet Impacts and Its Effects on Head Injury Metrics," SAE Technical Paper 2017-01-1433, 2017.

Foster JB, Kerrigan JR, Nightingale RW, Funk JR, Cormier JM, Bose D, Sochor MR, Ridella SA, Ash JA, Crandall JR, "Analysis of Cervical Spine Injuries and Mechanisms for CIREN Rollover Crashes," *Proceedings of the International Research Conference on the Biomechanics of Impact (IRCOBI)*, IRC-12-15-rev, pp. 61 – 75, 2012.

Cormier J, Manoogian S, Bisplinghoff J, Rowson S, Santago A, McNally C, Duma S, Bolte J: Biomechanical Response of the Human Face and Corresponding Biofidelity of the FOCUS Headform, SAE 2010-01-1317, *Society of Automotive Engineers Congress*, Detroit, MI; 2010.

Manoogian S, Funk J, Cormier J, Bain C, Guzman H, Bonugli E: Evaluation of Thoracic and Lumbar Accelerations of Volunteers in Vertical and Horizontal Loading Scenarios, SAE 2010-01-0146, *Society of Automotive Engineers Congress*, Detroit, MI; 2010.

Scott W, Bain C, Manoogian S, Cormier J, Funk J: Simulation Model for Low-Speed Bumper-to-Bumper Crashes, SAE 2010-01-0051, *Society of Automotive Engineers Congress*, Detroit, MI; 2010.

Raddin J, Cormier J, Smyth B, Croteau J, Cooper E: Compressive Neck Injury and its Relationship to Head Contact and Torso Motion during Vehicle Rollovers SAE 2009-01-0829, *Society of Automotive Engineers Congress*, Detroit, MI; 2009.

Funk J, Cormier J, Bain C, Guzman H, Bonugli E: Validation and Application of a Methodology to Calculate Head Accelerations and Neck Loading in Soccer Ball Impacts SAE 2009-01-0251, *Society of Automotive Engineers (SAE) Congress*, Detroit, MI; 2009.

Funk JR, Cormier JM, Bain CE, Guzman H, Bonugli E: Relationship Between Linear and Rotational Head Acceleration in Various Activities, *Proceedings of the 45th Annual Rocky Mountain Bioengineering Symposium*, in *Biomedical Sciences Instrumentation*, 44: 207 – 212, 2008.

Bisplinghoff J, Cormier J, Duma S, Kennedy E, Depinet P, Brozoski F: Development and Validation of Eye Injury and Facial Fracture Criteria for the Focus Headform, *Proceedings of the 26th Army Science Conference*, Orlando, FL; 2008.

Cormier J, Manoogian S, Bisplinghoff J, McNally C, Duma S: The Use of Acoustic Emission in Facial Fracture Detection, *Biomed. Sci. Instrum.*, 44: 147-52; 2008.

Santago AC, Cormier JM, Duma SM: Humerus Fracture Bending Risk Function for the 50th Percentile Male, *Biomed. Sci. Instrum.* 44: 231-6.

Santago AC, Cormier JM, Duma SM, Yoganandan N, Pintar FA: Forearm Fracture Bending Risk Function for the 50th Percentile Male, *Biomed. Sci. Instrum.* 44: 201-6.

Funk JR, Cormier JM, Bain CE, Guzman H, Bonugli E: An Evaluation of Various Neck Injury Criteria in Vigorous Activities, *Proceedings of the International Research Conference on the Biomechanics of Impact (IRCOBI)*, pp. 233 – 248, 2007.

Cormier JM, Stitzel JD, Hurst WJ, Porta DJ, Jones J, Duma SM: Predicting Zygoma Fractures from Baseball Impact, *Biomed. Sci. Instrum.*, 42:501-6; 2006.

Cormier JM, Stitzel JD, Duma SM, Matsuoka F: Regional Variation in the Structural Response and Geometrical Properties of Human Ribs, *Proceedings of the Association for the Advancement of Automotive Medicine*, 2005.

Funk JR, Cormier JM, Bain CE, “Analytical Model for Investigating Low-Speed Sideswipe Collisions,” SAE 2004-01-1185, *Society of Automotive Engineers (SAE) Congress*, Detroit, MI; 2004. Cormier JM, Hurst WJ, Stitzel JD, Herring IP, Duma SM: Investigation of Skin Abrasion Injuries from High Rate Shear Loading. *Proceedings of the World Congress of Biomechanics*, Calgary, AB; 2002.

Cormier JM, Stitzel J, Hurst WJ, Duma SM: High-Speed and Continuous Pressure Measurements: A Comparison of FlexiForce Sensors and Fuji Film. *Proceedings of the World Congress of Biomechanics*, Calgary, AB; 2002.

Hurst WJ, Cormier JM, Duma SM: Sonomicrometric Measurements for Eye Displacements. *Proceedings of the World Congress of Biomechanics*, Calgary, AB; 2002.

Other Publications

Kerrigan JR, Ash JH, Bose D, Sochor MR., Funk JR, Cormier JM, Manoogian SJ, Crandall JR: Thoracic Injury Mechanisms in Rollover Crashes, *Proceedings of the 38th International Workshop on Human Subjects for Biomedical Research*, NHTSA, Scottsdale, AZ; 2010.

Funk JR, Cormier JM, Zaleski S: Epidemiology of Cervical Spine Fractures in Rollover Crashes, *Proceedings of the Association for the Advancement of Automotive Medicine*, 2010.

Cormier JM: The Increase in Occupant Weight and its Effect on Thoracic Injuries, *Proceedings of the Association for the Advancement of Automotive Medicine*, 2007.

Cormier J, Stitzel J, Duma S, Matsuoka F: Microstructural Analysis of Osteon Orientation in Human Rib Cortical Bone, *Proceedings of the 31st International Workshop on Human Subjects for Biomedical Research*, NHTSA, San Diego CA; 2003.

Cormier JM, Stitzel JD, Duma SM, Hurst WJ: Predicting and Evaluating Zygoma Fractures from Baseball Impact. *Proceedings of the 30th International Workshop on Human Subjects for Biomechanical Research*, NHTSA, Ponte Vedra Beach, FL: 02S-58; 2002.

Cormier JM, Hurst WJ, Stitzel JD, Duma SM: Investigation of Skin Abrasion Injuries from High Rate Shear Loading. *Proceedings of the 1st Annual Center for Biomedical Engineering Symposium*, Virginia Tech, Blacksburg VA; 2002.

Hurst WJ, Cormier JM, Duma SM: Sonomicrometric Measurements for Eye Displacements. *Proceedings of the 1st Annual Center for Biomedical Engineering Symposium*, Virginia Tech, Blacksburg VA; 2002.

Hurst WJ, Stitzel JD, Cormier JM, Duma SD: A New Methodology for Investigating Airbag Induced Skin Abrasions. *Proceedings of the 30th International Workshop on Human Subjects for Biomechanical Research*, NHTSA, Ponte Vedra Beach, FL: 02S-58; 2002.

Stitzel JD, Power E, Cormier JM, Hurst WJ, Herring IP, Duma SM: Computational Modeling and Experimental Validation of Globe Deformation Due to Impact with High Speed Foam Particles. *Proceedings of the 1st Annual Center for Biomedical Engineering Symposium*, Virginia Tech, Blacksburg VA; 2002.

Stitzel JD, Cormier JM, Barretta JT, Duma SM: Elderly Thorax Properties for Model Development. *Proceedings of the 2nd Annual Center for Biomedical Engineering Symposium*, Virginia Tech, Blacksburg VA; 2003.

Invited Presentations

Impact Biomechanics: Vehicle Safety and Injury Causation Analysis, *Biomedical Engineering Department*, UTSA, November 6; 2015.

Cormier J, Freund M, Bonugli E, Guzman H: Passenger Car Response to Interaction with Tractor-Trailer Steer Tire Lugs, *SAE Int. J. Commercial Vehicles* 7(1): 2014.

Cormier J: FOCUS Headform and Facial Fracture Tolerance, *Military Injury Biomechanics*, Washington DC, 2011.

Cormier J, Manoogian S, Bisplinghoff J, Rowson S, Santago A, McNally C, Duma S, Bolte J: The Tolerance of the Nasal Bone to Blunt Impact, *Annals of Advances in Automotive Medicine*, 54: 2010.

Cormier J, Manoogian S, Bisplinghoff J, Rowson S, Santago A, McNally C, Duma S, Bolte J: Biomechanical Response of the Human Face and Corresponding Biofidelity of the FOCUS Headform, SAE 2010-01-1317, *Society of Automotive Engineers Congress*, Detroit, MI; 2010.

Cormier, JM, Duma, SM, "Epidemiology of Facial Fractures in Automotive Collisions," *Annals of Advances in Automotive Medicine*, 53, 2009.

FOCUS Headform and Facial Fractures, *Injury Biomechanics: With Military and Aerospace Applications*, Arlington VA, 2009.

It All Comes to Physics: An Overview of Impact Biomechanics and Skeletal Trauma Workshop, *Association of Medical Illustrators*, Richmond VA, 2009.

Biomechanics, *Good Samaritan Community Services Summer Employment and Work Readiness*, San Antonio TX; 2009.

Cormier JM: Curtain Airbag Biomechanics, Emerging Issues in Motor Vehicle Product Liability Litigation, *American Bar Association*; 2009.

Cormier JM: The Increase in Occupant Weight and its Affect on Thoracic Injuries, *Proceedings of the Association for the Advancement of Automotive Medicine*, 2007.

Funk JR, Cormier JM, Bain CE, Guzman H, Bonugli E: An Evaluation of Various Neck Injury Criteria in Vigorous Activities, *Proceedings of the IRCOBI Conference*, 2007.

Determining the Risk of Facial Fracture from Blunt Loading: A Review of Facial Bone Fracture Patterns and Injury Tolerances, *Automotive Safety and Injury Biomechanics Workshop*, Blacksburg VA; March 24, 2007.

Automotive Safety and Injury Biomechanics Workshop: Thoracic Biomechanics, Blacksburg VA; October 14, 2005.

Cormier JM, Stitzel JD, Duma SM, Matsuoka F: Regional Variation in the Structural Response and Geometrical Properties of Human Ribs, *Proceedings of the Association for the Advancement of Automotive Medicine*, 2005.

Biomechanics of the Cervical Spine – University of Texas at San Antonio
April 2005.

Cormier JM, Stitzel JD, Duma SM, Matsuoka F: Microstructural Analysis of Osteon Orientation in Human Rib Cortical Bone, *Proceedings of the 31st International Workshop on Human Subjects for Biomedical Research*, NHTSA, San Diego CA; 2003.

Cormier JM, Hurst WJ, Stitzel JD, Duma SM, Porta D: Occupant Interaction with a Deploying Pelvic Restraint Cushion. *Proceedings of the 2nd Annual Center for Biomedical Engineering Symposium*, Virginia Tech, Blacksburg VA; 2003.

Cormier JM, Hurst WJ, Stitzel JD, Duma SM, Porta D: Predicting and Evaluating Orbital Fractures from Baseball Impact. *Proceedings of the 2nd Annual Center for Biomedical Engineering Symposium*, Virginia Tech, Blacksburg VA; 2003.

Cormier JM, Hurst WJ, Stitzel JD, Duma SM: Investigation of Skin Abrasion Injuries from High Rate Shear Loading. *Proceedings of the 1st Annual Center for Biomedical Engineering Symposium*, Virginia Tech, Blacksburg VA; 2002.

Cormier JM, Stitzel JD, Duma SM, Hurst WJ: Predicting and Evaluating Zygoma Fractures from Baseball Impact. *Proceedings of the 30th International Workshop on Human Subjects for Biomechanical Research*, NHTSA, Ponte Vedra Beach, FL: 02S-58; 2002.