



BACKGROUND

Ms. McCartney earned a Bachelor of Science in Biomedical Engineering from the University of Rochester and a Master of Science degree in Biomedical Engineering from Virginia Tech. At Virginia Tech, her research focused on head injury biomechanics, including the evaluation of industrial safety helmets' ability to reduce injury during falls and the development of a new lab-based protocol for evaluating racing helmets. She also researched head kinematics and eye tracking as a clinical measure in athletes with high levels of head impact exposure. Her course work focused on understanding human responses, injury mechanisms, and human tolerances to a range of impact events, and provided an understanding of common injury risk metrics and laboratory test methods used in transportation safety research.

AREAS OF EXPERTISE

- Injury Causation Biomechanics
- Brain Injury Biomechanics
- Human Injury Mechanisms and Tolerances
- Vehicular Accident Reconstruction

EDUCATION

- Master of Science degree in Biomedical Engineering, Virginia Tech, May 2021
- Bachelor of Science in Biomedical Engineering, focus in biomechanics, University of Rochester, May 2019

PROFESSIONAL EXPERIENCE

June 2019 – Present | ARCCA, LLC | Coordinating Expert

- Applies scientific and biomechanical principles to evaluate injury causation.
- Uses and performs research involving human volunteers and anthropometric test devices to understand human responses to an event, injury mechanisms, and human tolerance.
- Utilizes medical records, testing, computer modeling and knowledge of human injury tolerance to determine whether a claimed injury is consistent with a specific set of actions or exposure to a specific incident environment.

August 2019 – May 2021 | Virginia Tech, Department of Biomedical Engineering and Mechanics | Graduate Research Assistant

- Virginia Tech Helmet Lab. Lab research focuses on biomechanics of traumatic head injury, especially understanding and reducing concussion in sports.
- Evaluated the ability of construction hard hats to reduce injury during falls. Developed a new testing protocol for racing helmets, in coordination with Wake Forest University. Designed a human subjects research study that will investigate eye tracking and head kinematics in athletes that experience high levels of head impact exposure.

**May 2018 – May 2019 | ARCCA, Incorporated | Sports Biomechanics Intern**

- Began development of an inexpensive and portable motion capture system to analyze sports performance, researched marker-less tracking methods, analyzed data using MATLAB, assisted in mechanical testing of athletic equipment. Gained exposure to injury causation and prevention analysis, compliance with regulatory agencies.

Summer 2017 | Ithaca College, Department of Exercise and Sport Sciences | Research Volunteer under Deborah King

- Learned basic use of Vicon Motion Capture Systems, Visual3D and LabView software in a Biomechanics Lab. Collected, analyzed and processed data, performed statistical analysis and assisted in drafting of publication.
- King, Deborah L., **Maura McCartney**, and Eoghan Trihy. "Initial contact and toe off event identification for rearfoot and non-rearfoot strike pattern treadmill running at different speeds." *Journal of Biomechanics* 90 (2019): 119-122.

PROFESSIONAL AFFILIATIONS

- Member of the Biomedical Engineering Society (BMES) student chapter at Virginia Tech and University of Rochester