

## Curriculum Vitae

# Kyle Serkies, B.A.Sc., M.A.Sc., P.Eng.

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## PRACTICE AREAS

### Product & Material Failure Investigations

- Failure Analysis
- Product Testing
- Material Analysis
- Vehicle Component Failure
- Plumbing & Household Appliance Component Failure
- Code & Standards Compliance Assessments
- Video Analysis

### Collision Reconstruction

- Motorcycle Collisions
- E-bike & Bicycle Collisions
- Can Am Spyder & Tricycle Collisions
- ATV, Snowmobile, & Recreational Off-Highway Vehicle Collisions
- Collision Re-enactments
- Nighttime Visibility Assessments
- Computer Simulation & Animations
- Crash Data Recorder Analysis
- Video Analysis

### Fire Origin & Cause Investigations

- Residential Fires
- Vehicle Fires
- Product Fires

## ACADEMIC BACKGROUND

Master of Applied Science, Biomedical Engineering, University of Toronto, 2015

- Graduate courses in biomedical device design, biomaterials, & biofilms

Honours Bachelor of Applied Science, Materials Engineering with Bioengineering minor, University of Toronto, 2011

- Undergraduate courses in the mechanical behaviour of materials, fracture & failure analysis, corrosion, material characterization & selection, materials processing & manufacturing, computer simulation, dynamics, thermodynamics, electricity & circuits, & physiology



## EMPLOYMENT HISTORY

### **Advantage Forensics Inc., Toronto**

Vice-President, February 2021 to Present

Senior Forensic Engineer, February 2019 to January 2021

Forensic Investigator, March 2015 to January 2019

- Lead investigator, involved in 450+ personal injury & insurance subrogation cases, primarily in the areas of material/product failures, collisions, & fires

### **Humber College, Transportation Training Centre, Etobicoke**

Motorcycle Instructor, February 2018 to October 2019

- Taught students how to operate a motorcycle in a correct and safe manner in the Ontario Ministry of Transportation's approved "Learn to Ride a Motorcycle (M1 to M2)" licencing course

### **Tequila Jacks Toronto, Toronto**

Security Manager, September 2014 to June 2016

Security Staff, April 2011 to August 2014

- Managed security staff, liaised with Fire & Police Departments, & provided fact witness testimony in court

### **York Simcoe Bucks, Ontario Varsity Football League, Newmarket**

Linebacker, Special Teams, & Strength & Conditioning Coach, October 2013 to July 2015

- Coached proper techniques & developed the speed & strength of youth football players in preparation for collegiate level competition

### **Institute of Biomaterials & Biomedical Engineering, University of Toronto, Toronto**

Graduate Research Assistant, September 2011 to December 2014

- Analyzed the fracture toughness, failure mode, & chemical polymer degradation of adhesive biomaterial specimens using Instron test machines, scanning electron microscopes, chromatography, & spectroscopy

### **Department of Materials Science & Engineering, University of Toronto, Toronto**

Head Teaching Assistant, January to April 2014

Teaching Assistant, January to April 2013

- Instructed tutorials for the "Molecules & Materials" engineering undergraduate course

### **Department of Materials Science & Engineering, University of Toronto, Toronto**

Undergraduate Research Assistant, September 2010 to August 2011

- Designed & used a state-of-the-art force tester to determine the strength & failure mode of adhesive zebra mussel plaques using various force gauges as well as electron & stereomicroscopes

## PROFESSIONAL SOCIETIES & ASSOCIATIONS

- Professional Engineers of Ontario (PEO), P. Eng. since 2019
- The Canadian Association of Technical Accident Investigators & Reconstructionists (CATAIR), since 2015
- The Minerals, Metals & Materials Society (TMS), since 2015
- The American Society for Testing & Materials (ASTM), since 2015
  - Committee C14: Glass & Glass Products

- C14.04 Sub-committee: Physical & Mechanical Properties
- Committee D14: Adhesives
  - D14.30 Sub-committee: Wood Adhesives
  - D14.40 Sub-committee: Adhesives for Plastics
  - D14.80 Sub-committee: Metal Bonding Adhesives
- Committee D20: Plastics
  - D20.10 Subcommittee: Mechanical Properties
  - D20.10.24 Subcommittee: Fracture & Fatigue
- Committee D30: Composite Materials
  - C30.02 Sub-committee: Research & Mechanics
- Committee E08: Fatigue & Fracture
  - E08.05 Sub-committee: Cyclic Deformation & Fatigue Crack Formation
  - E08.06 Sub-committee: Crack Growth Behavior
  - E08.07 Sub-committee: Fracture Mechanics
- Committee E30: Forensic Sciences
- Committee E58: Forensic Engineering
  - E58.02 Sub-committee: Product Defect Incidents
  - E58.03 Sub-committee: Vehicular Incidents
- Committee F08: Sports Equipment, Playing Surfaces, & Facilities
  - F08.10 Sub-committee: Bicycles
  - F08.24 Sub-committee: Paintball & Equipment
  - F08.30 Sub-committee: Fitness Products
  - F08.53 Sub-committee: Headgear & Helmets
  - F08.55 Sub-committee: Body Padding
- Committee F09: Tires
  - F09.20 Sub-committee: Vehicular Testing
- Committee F13: Pedestrian/Walkway Safety & Footwear
  - F13.50 Subcommittee: Walkway Surfaces

## ADDITIONAL COURSES & TRAINING

- Product & Material Failure Investigation Training Courses:
  - “Electrical Testing in Vehicles”, Advantage Forensics, webinar, January 2021
  - “Property Tech Talk – Sprinkler Failures”, CEP Forensic, webinar, June 2020
  - “Forensic Engineering Outlook of Failure Analysis in Product & Mechanical Systems”, Advantage Forensics, webinar, Toronto, June 2020
  - “Failure Analysis Related to Metal Forming, Heat Treatment, & Fabrication in Automotive & Aerospace Industries”, SAE International, seminar, Oakville, March 2019
  - “ASTM Committee Week”, ASTM, committee meetings, Toronto, June 2017
  - “Residential Oil Spills: A Messy Business”, Origin and Cause, webinar, April 2016
  - “Laboratory Biosafety”, University of Toronto, course, Toronto, January 2012
- Collision Reconstruction Training Courses:
  - “Competition Riding Phase 1”, Facilities for Advanced Streetbike Training (FAST) Riding School, course, Shannonville, September 2020
  - “Probability of Frontal Airbag Deployment in Bumper-Bumper and Underride Collisions”, Advantage Forensics, webinar, July 2020
  - “Analysis of Searle, Wood & Intech Equations to Calculate Vehicle Impact Speed in Multiple Pedestrian Collisions”, Advantage Forensics, webinar, July 2020
  - “Automatic Vehicle Data Forensics”, Advantage Forensics, webinar, July 2020
  - “Delta-V from Curb Impacts” Advantage Forensics, webinar, June 2020
  - “Looming Detection Thresholds for Collisions”, Advantage Forensics, webinar, June 2020
  - “Collision Tech Talk – Vulnerable Road Users & Nighttime Impacts”, CEP Forensic, webinar, June 2020
  - “Automatic Emergency Braking Systems”, Advantage Forensics, webinar, June 2020

- "Traffic Trends & Safety in a COVID-19 World", Transportation Research Board, webinar, June 2020
- "Identifying Road Design Issues", Advantage Forensics, webinar, May 2020
- "PC-Crash Training Course: 401 Staged Collisions", MEA Forensics, webinar, April 2020
- "PC-Crash 12.0: Latest Features", Advantage Forensics, webinar, April 2020
- "Human Factors Related to Perception Reaction Times", Advantage Forensics, webinar, April 2020
- "Understanding Forensic Human Factors Through Case Study Analysis", Advantage Forensics, webinar, April 2020
- "Using Shadow Analysis to Determine Time", Advantage Forensics, seminar, Toronto, March 2020
- "How to Safely Examine a Hybrid Electric/Electric Vehicle", Advantage Forensics, seminar, Toronto, March 2019
- "Childhood Road Traffic Injuries in Canada – A Provincial Comparison of Transportation Injury Rates Over Time", CARSP, webinar, December 2018
- "2018 CATAIR Annual General Meeting & Conference", CATAIR, conference, Alymer, August 2018
- "Reconstruction & Analysis of Motorcycle Crashes", SAE, course, Detroit, Michigan, April 2018
- "iVe Forensic Acquisition System of Infotainment Data", Advantage Forensics, seminar, Toronto, March 2018
- "Motorcycle Rider Instructor Training" Humber College, course, Etobicoke, February 2018
- "Childhood Road Traffic Injuries in Canada" CARSP, webinar, January 2018
- "Drug Recognition Evaluator Program & Cannabis", CARSP, webinar, September 2017
- "Features & Accuracy of Crash Data Recorders, 2017 Update", Advantage Forensics, seminar, Toronto, August 2017
- "Tire Forensics & Accident Reconstruction", CATAIR, seminar, Toronto, 2017
- "WREX 2016 Collision Reconstruction Conference", WREX conference, Orlando, Florida, May 2016
- "Collision Reconstruction Journal Review Series", Advantage Forensics, seminar, Toronto, January to March 2016
- "Extracting Commercial Vehicle EDR Black Box Recorders", Origin and Cause, webinar, February 2016
- "Advanced Collision Reconstruction with CDR Applications", CATAIR, course, Whitby, February 2016
- "Crush Energy Analysis", Advantage Forensics, training workshop, Toronto, 2016
- "PC-Crash 10.0: Assumptions & Inputs", Advantage Forensics, training workshop, Toronto, 2016
- "PC-Crash 10.0: Simulation & Analysis", Advantage Forensics, training workshop, Toronto, 2016
- "PC-Crash Essentials Training Course: Latest Features", MEA Forensics, webinar, 2015
- "PC-Crash Essentials Training Course: Vehicle Control", MEA Forensics, webinar, 2015
- "Motorcycle Maintenance" Humber College, course, Etobicoke, May 2015
- "Motorcycle Operator Training", Learning Curves, course, Toronto, August 2012
- Fire Origin & Cause Investigation Training Courses:
  - "Property Tech Talk – Fire Investigation", CEP Forensic, webinar (1 hour), June 2020
  - "CFI Trainer Training Programs", CFI Trainer.net, online training modules (232 hours), January 2019 to August 2020  
70 tested modules covered topics on fire science, fire chemistry, thermodynamics, thermometry, fire dynamics, explosion dynamics, computer fire modeling, fire investigation, fire analysis, fire investigation methodology, fire investigation technology, hazardous materials, failure analysis & analytical tools, fire protection systems, evidence documentation, collection, & preservation, and electricity & electrical systems
- Forensic Video Analysis Training Courses:
  - "Forensic Video Analysis: Video Literacy", iINPUT-Ace, course, June 2021
  - "The Democratization of Video Evidence: Equipping Investigators with Modern Tools & Know-How", iINPUT-Ace, webinar, February 2020
  - "iINPUT-Ace Forensic Video Analysis", Advantage Forensics, training workshop, Toronto January 2020
- Professional Development Training Courses:
  - "Legal Writing Workshop", Caroline Mandell, training workshop, Toronto, February 2019

- “Persuasive Communication”, Experts.com webinar, September 2017
- “Practical Strategies for Experts: Testifying Without Fear”, PIA Law, seminar, Toronto, October 2016

## LECTURES & TEACHING ENGAGEMENTS

- University Engineering Course Guest Lecturer:
  - “Materials in Forensic Engineering”, York University MECH 2301: Mechanics of Materials I course, Toronto, November 2020, November 2019
- Conference Speaker:
  - Panellist: “Examining & Cross-Examining Experts”, The Advocates Society, Toronto, May 2019, April 2018, April 2017, February 2016, May 2015
  - Field Day Demonstrator: “Crash Vehicle Injuries: What to Look For”, WREX2016, Orlando, Florida, May 2016
  - Poster Presenter: “Introducing the Standard Ambient Illumination Factor”, WREX2016, Orlando, Florida, May 2016
  - Oral Presenter: “Does Matrix-Metalloproteinase Inhibition Affect Esterase-mediated Degradation of Self-etched Resin-dentin Interfaces”, International Association for Dental Research General Session, Boston, Massachusetts, March 2015
  - Poster Presenter: “The Effect of Simulated Human Salivary Enzymes & Matrix-Metalloproteinase Inhibition on the Degradation & Fracture Toughness of the Self-Etched Resin-dentin Interface”, University of Toronto Faculty of Dentistry Research Day, Toronto, February 2015
  - Poster Presenter: “The Effect of Simulated Human Salivary Enzymes & Matrix-Metalloproteinase Inhibition on the Degradation & Fracture Toughness of the Self-Etched Resin-dentin Interface”, University of Toronto Institute of Biomaterials & Biomedical Engineering Research Day, May 2014
  - Poster Presenter: “Byssal Plaque Adhesion Strength of Dreissena Polymorpha”, University of Toronto Department of Materials Science & Engineering, April 2011
- Seminar/Webinar Presenter:
  - “The Incorporation of EDRs and Data Recording Technology into Motorcycles and Recreational Vehicles”, Advantage Forensics 2021, Biologic Forensics 2021
  - “Motorcycle Collisions: Understanding Motorcycle Dynamics and Operator Limitations”, Boghosian + Allen LLP December 2020, Avanesy Giordano LLP August 2020
  - “A Collision Reconstructionist’s Guide to: Motorcycle Collision Analysis”, Advantage Forensics, Toronto, July 2020
  - “Forensic Engineering Experts”, Smitiuch Injury Law, Toronto, February 2020
  - “Coefficients of Restitution for Low & Moderate Speed Impacts with Non-Standard Impact Configurations”, Advantage Forensics, Toronto, April 2016
  - “Comparing Equations Relating Speed to Static Deformation for Frontal Narrow-Object Impacts”, Advantage Forensics, Toronto, January 2016

## JOURNAL PAPERS & PUBLICATIONS

- Young J.A., **Serkies K.**, Prentice G., Young R., Martinez A., “Categorizing Unintended Acceleration Collisions from Event Data Recorders”, 28<sup>th</sup> CARSP Road Safety Conference, June 2018
- **Serkies K.S.**, Garcha R., Tam L.E., De Souza G.M., Finer Y. (2016), “Matrix Metalloproteinase Inhibitor Modulates Esterase-Catalyzed Degradation of Resin-Dentin Interfaces”, Dental Materials. 32(12):1513-1523
- **Serkies K.**, “Byssal Plaque Adhesion Strength of Dreissena Polymorpha & Dreissena Bugensis on Polymeric Substrates”, Institute of Biomaterials & Biomedical Engineering: Proceedings of the IBBME Undergraduate Summer Research Program, 2011



## LICENCES & CERTIFICATIONS

- Ontario Class M Motorcycle Licence, 2014 to present
- Ontario Class G Vehicle Licence, 2010 to present
- Ontario Private Security Licence, 2009 to 2016
- Ontario Smart Serve Certification, 2009 to present
- Ontario Pleasure Craft Operators Licence, 2005 to present

## AWARDS

- Heraeus Kulzer Travel Award in Dental Materials, International Association for Dental Research, 2015
- School of Graduate Studies Conference Grant, University of Toronto, 2014
- Undergraduate Student Research Award, Natural Sciences & Research Council of Canada, 2011
- Nanotechnology Summer Fellowship Top-Up Award, University of Toronto, 2011
- Dean's Honour List, University of Toronto, 2009 to 2011