

## Curriculum Vitae

# Harshvir Singh, B.Eng., M.Eng., EIT

Advantage Forensics® Inc. (416) 630-0700

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## PRACTICE AREAS

- **Electrical Failure**
- **Collision Reconstruction**
- **Fire Investigation**
- **Product Failure**
- **Video Analysis**
- **Motorcycle Collisions**
- **Pedestrian and Bicycle Collisions**
- **Social Media Investigation**
- **Computer Simulation & Animation**

## ACADEMIC BACKGROUND

### **Master of Engineering, Electrical & Computer Engineering, Queen's University, Kingston 2019**

- Graduate-level courses in Power Electronics, Modelling, and Control of Power Converters, Emerging Technologies in Power Grid, Electric Machines, and Control.
- Research project title – On-skin wearables for smart devices interface.

### **Bachelor of Engineering, Electrical Engineering, Thapar University, India, 2018**

- Undergraduate level courses in Power System Analysis and Stability, Optimization and Control of Power Systems, Switchgear and Protection, FACTS, Power Generation, Transmission and Distribution, Power Electronics, Control Systems, Electric Drives, AC Machines, DC Machines, and Transformers.

## EMPLOYMENT HISTORY

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

*Forensic Engineering Associate, January 2020 to present*

- The lead of the Electrical team
- Member of Fire Investigation, Collision Reconstruction, and Product Failure Teams.

### **Department of Electrical & Computer Engineering, Queen's University**

*Research Assistant, Nano Lab, March 2019 to August 2019*

- The focus of the study was wearable technology, sensors, and medical devices. Designed and created a hardware prototype of an on-skin capacitor-based pressure sensor array as a skin input interface for smart devices.

### **Department of Electrical Engineering, Thapar University**

*Research Assistant, Smart Grid Lab, January 2017 to June 2018*



- Strengthened fundamentals of power electronics, digital and analog electronics by working on designing and creating a hardware prototype of an electric vehicle battery charger.

**Punjab State Transmission Corporation Ltd, India**

*Intern, May 2016 to August 2016*

- Interned at the utility company's 220kV substation in Ludhiana, India. Gained the first-hand experience with the transmission and distribution network of the province. I worked under the junior engineer to ensure optimal operation of the machines and protection devices by participating in periodic inspections and learned about codes and standards.

## PRESENTATIONS

- 'Electrical Testing in Vehicles', Advantage Forensics webinar, January 2021
- 'Probability of Frontal Airbag Deployment in Bumper-Bumper and Underride Collisions', Advantage Forensics webinar, July 2020
- 'New Features and Improvements in PC Crash 12.0', Advantage Forensics webinar, Toronto, April 2020

## ADDITIONAL COURSES, TRAINING & AWARDS

- **Collision Reconstruction**
  - 'Recreational Vehicle EDRs', Advantage Forensics webinar, January 2021
  - 'Journal review of Talking and Driving', Advantage Forensics webinar, August 2020
  - 'Driver Behavior in Adverse Weather Conditions', Advantage Forensics webinar, August 2020
  - 'Vehicle acceleration rates when starting from a stop position', Advantage Forensics webinar, July 2020
  - 'Detailed Vehicle Profile Crush Measurements Webinar', Laser Technology Inc, Toronto (Virtual), July 2020
  - "A Collision Reconstructionist's Guide to Motorcycle Collision Analysis", 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
  - 'Traffic Engineering', Canadian Association of Road Safety Professionals and the City of Calgary, Toronto (Virtual), June 2020
  - 'Relative Velocity Detection and Driver Response Time in Vehicle Following Scenarios: Current Data and Research on Looming Thresholds', Advantage Forensics webinar, June 2020
  - 'Crash Avoidance Explained', Insurance Institute for Highway Safety, Toronto (Virtual), June 2020
  - 'Journal Review of Performance of Automatic Emergency Braking in Passenger Vehicles', Advantage Forensics webinar, June 2020
  - 'Driver Checking Failures towards Pedestrians and Cyclists: An On-road Study', Canadian Association of Road Safety Professionals and City of Calgary, Toronto (Virtual), June 2020



- 'Traffic Trends and Safety in a COVID World', Transportation Research Board, Toronto (Virtual), June 2020
- 'Writing Formal Reports', Advantage Forensics webinar, May 2020
- 'Identifying Road Design and Signage Issues in Relation to Motor Vehicle Collisions', Advantage Forensics webinar, May 2020
- 'Strategies for Relaying Verbal Findings', Advantage Forensics webinar, May 2020
- 'How to Write Technical Papers', Advantage Forensics webinar, May 2020
- 'Perception Reaction Time', Advantage Forensics webinar, April 2020
- 'Analysis of Opportunity to Avoid a Collision', Advantage Forensics webinar, April 2020
- 'Human Factors in Collisions', Advantage Forensics webinar, April 2020
- Collision Reconstruction Journal Review Series, Advantage Forensics in-house seminar, Toronto, January 2020
- 'PC Crash 10.0 Assumptions & Inputs' workshop, Advantage Forensics in-house training, Toronto, January 2020
- 'Crush Energy Analysis' workshop, Advantage Forensics in-house training, Toronto, January 2020
- 'PC Crash 10.0 Simulations & Analysis' workshop, Advantage Forensics in-house training, Toronto, January 2020
- Video Forensics
  - "Forensic Video Analysis: Video Literacy" Course, iINPUT ACE, June 2021
  - 'The Democratization of Video Evidence: Equipping Investigators with Modern Tools and Know-How', iINPUT ACE webinar, Toronto, March 2020
  - 'iINPUT ACE video analysis' workshop, Advantage Forensics in-house training, Toronto, January 2020
- Product and Material failure Investigation
  - 'Forensic Engineering Outlook of Failure Analysis in Product and Mechanical Systems', Advantage Forensics in house seminar, Toronto, June 2020
- Fire Origin & Cause Investigation Training Courses
  - 'Fire Investigation 101: A Forensic Expert's Process & Mentality', Origin & Cause, September 2020
  - 'Through Fire and Water - Investigating Marine Fire and Explosion Claims', Origin & Cause, August 2020
  - 'Arc Mapping - Down to the Wire webinar', Origin & Cause, July 2020
  - 'Property Tech Talk: Fire Investigation', CEP Forensic, Toronto (Virtual), June 2020
  - "CFI Trainer.net Training Programs", CFI Trainer.net, online training modules (101 hours), January 2020 to July 2020
    - 30 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
- Health & Safety Awareness, Queen's University, Kingston, 2019

## PAPERS, PUBLICATIONS & PROJECTS

- Coauthored the article 'Your decision to invest in a modern vehicle may save your life', WP Magazine, May 2021

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- Design of a Series Resonant Converter, Graduate project, Queen's University, 2019
- Design of  $V^2$  Control for Buck Converter, Graduate project, Queen's University, 2019
- Design and testing of an Electric Vehicle Battery Charger, Undergraduate research project, Thapar University, 2018
- Portable Power Supply via Solar Energy, Undergraduate Capstone project, Thapar University, 2017

**PROFESSIONAL SOCIETIES & ASSOCIATIONS**

Professional Engineers of Ontario, EIT since 2020