



Curriculum Vitae of
TILO D. VOITEL
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3D Forensic Metrologist / Vehicle Collision Reconstructionist / Forensic Video Analyst

Mr. Voitel has over 32 years of experience as a Law Enforcement Officer. During that time, he also worked for a forensic engineering firm for 7 years. Mr. Voitel has investigated over 2,300 traffic collisions and has testified as an expert witness in both criminal and civil proceedings in local, state, and federal courts. Mr. Voitel has been involved with forensic metrology and 3D laser scanning since 2008 and video analysis since 2010.

EMPLOYMENT HISTORY

Denver Metro Forensics, Inc., 2021 - Present
Deputy (Reserve), Douglas County Sheriff's Office, 2018 - 2021
Account Manager, FARO Technologies, Inc., 2017 - 2021
Part Time Officer, RTD-Denver, 2011-2018
Accident Reconstructionist, Kineticorp, LLC, 2010 – 2017
Police Detective, Denver Police Department, Traffic Investigations Bureau, 2000 – 2011
Patrol Officer, Denver Police Department, 1995 – 2000
Motorcycle Officer, Fullerton, CA Police Department, 1994 – 1995
Patrol Officer, Fullerton, CA Police Department, 1989 – 1994
Helicopter Crew Chief/Safety Evaluator, United State Marine Corps, 1983 – 1989

EDUCATION

Over 1500 hours of job specific training
Denver Police Academy (1995)
Orange County Sheriff's Academy (1990)

ACCREDITATIONS

Accredited Traffic Accident Reconstructionist #1256 – Accreditation Commission for Traffic Accident Reconstruction, received 02/2002 (expires 03/2026).

LICENSES

SUAS Remote Pilot (issued 6/17/2022)
Colorado Commercial Driver's License – Class A (motorcycle endorsed)

ACCIDENT RECONSTRUCTION

Mr. Voitel has extensive experience performing traffic collision investigations throughout the United States. His hands-on investigative experience includes inspections of hundreds of vehicles and collision scenes. Mr. Voitel's experience includes interviewing witnesses as well as investigating and reconstructing collisions involving vehicles, heavy vehicles, motorcycles, bicycles, pedestrians, signal timing and more.

FORENSIC METROLOGY

Mr. Voitel has extensive experience in the 3D documentation and analysis of crime and traffic scenes. This includes the post—processing of 2D and 3D data captured from drones, video cameras, 3D scanners and others. These data sets have subsequently been used to analyze critical incidents and create animations and visualizations to assist during investigations and eventually trial proceedings if necessary.

FORENSIC VIDEO ANALYSIS

Mr. Voitel has been involved with forensic video analysis since 2010. He has recently become a consultant with Axon Investigate, teaching their courses related to obtaining measurements and speed from video.

EXPERT TESTIMONY

As a result of his investigations, training and experience, Mr. Voitel has testified in both criminal and civil court and has been recognized as an expert since 2001.

PROFESSIONAL AFFILIATIONS

Association for Crime Scene Reconstruction
International Network of Collision Reconstructionists

PUBLICATIONS

- Liscio E, Le Q, Rider R, **Voitel T.**, Accuracy of Linear Measurements using Google Maps in FARO Zone 3D for Forensic Reconstruction of Outdoor Scenes. *J Assoc Crime Scene Reconstr.* 2021;25:11-23.
- Terpstra T, Owens T, Hashemian A, **Voitel T.**, Depth Mapping Accuracy Evaluation of the Microsoft Kinect v2 Motion Capture Sensor. *J Assoc Crime Scene Reconstr.* 2021;25:1-10.
- Terpstra, T., Neale, W.T.C., Owens, T., King, E., Bier S., **Voitel, T.**, “An Analysis of Body-Worn Camera Photogrammetry Using Depth Mapping.” *Proceedings of the American Academy of Forensic Sciences, 73rd Annual Scientific Meeting*, Held Virtually. 2021. C21.
- Terpstra T, Hashemian A, **Voitel T**, Priest J. A Comparison of Metrology Used in Documenting Shooting Incident Trajectories. *J Assoc Crime Scene Reconstr.* 2020;24:23-42.
- Muttart, J., Dinakar, S., Suway, J., Kuzel, M. et al., "Comparing A Timed Exposure Methodology to the Nighttime Recognition Responses from SHRP-2 Naturalistic Drivers," SAE Technical Paper 2017-01-1366, 2017.
- Terpstra, T., **Voitel, T.**, Hashemian, A., “A Survey of Multi-View Photogrammetry Software for Documenting Vehicle Crush.” SAE, Paper 2016-01-1475. Detroit, MI. (2016).
- Rose, Nathan A., Neal R. Carter, David Pentecost, **Tilo Voitel**, William Bortles, “Using Data from a DriveCam Video Event Recorder to Reconstruct a Vehicle-to-Vehicle Impact,” Paper Number 2013-01-0778, *Society of Automotive Engineers*.
- Benefits of 3D Laser Scanning in Vehicle Accident Reconstruction – Technology White Paper for FARO, www.faro.com
- Using Security Camera Video in Accident Reconstruction – Journal of the Association for Crime Scene Reconstruction, Volume 16, Issue 1, Winter 2010: pages 11-16
- Beauchamp, Gray, Hessel, David, Rose, Nathan A., Fenton, Stephen J., **Voitel, Tilo**, “Determining Steering and Braking Levels from Yaw Mark Striations,” Paper Number 2009-01-0092, Society of Automotive Engineers, 2009, published in the *SAE International Journal of Passenger Cars – Mechanical Systems* 2(1):291-307.

OTHER INTERESTS

Mr. Voitel is a licensed motorcycle rider, licensed commercial vehicle operator and enjoys water skiing and boating.

TRAINING, TECHNICAL CONFERENCES AND SEMINARS ATTENDED:

Axon Investigate (iNPUT-ACE) – Metrologist Certification – 6/2022 (8 hours online)
Recon-3D Training (IPad LiDAR) – 6/2022 (4 hours)
iNPUT-ACE Examiner Certification – 4/2022 (8 hours online)
iNPUT-ACE Operator Certification – 4/2022 (8 hours online)
Basic Laser Scanner Certification (IAFSM) – Westminster, CO 2/2022 (expires 2-17-2027)
Joint Conference (ASCR/IAFSM) – Westminster, CO 2/2022 (5 days)
ACSR Annual Conference – Tulsa, OK 3/2021 (3 days)
Photogrammetry 4 Forensics (AI2-3D) – Online Course 7/2020 (8 hours over 2 days plus projects)
ACSR Annual Conference – Reno, NV 3/2020 (3 days)
Video Examinations for the Police Investigator (Forensic Video Solutions) – West Jordan, UT 9/2019 (2 days)
FARO Focus 3D Scanner Certification – UT 5/2018 (3 days)
FARO Zone 3D Advanced On-Line Self-Paced course – 9/2017
Fundamentals of Bus Collision Investigation (TSI) – Denver, CO 7/2017 (5 days)
Human Factors for Traffic Crash Reconstruction – Fort Collins, CO 4/2017 (5 days)
ACSR Annual Conference – Black Hawk, CO 2/2017 (3 days)
UAS Flight Safety Program – Centennial, CO 9/2016 (1 day)
PC Crash Online Training - 8/2016 (6 hours)
WREX 2016, World Reconstruction Exposition – Orlando, FL 5/2016 (5 days)
Shooting Incident Reconstruction – Denver, CO 7/2015 (5 days)
Heavy Vehicle Crash Reconstruction – Evanston, IL 5/2015 (5 days)
Preserving and Analyzing Information from Heavy Vehicle EDR's – Evanston, IL 04/2013 (5 days)
Motorcycle Safety Foundation Rider Course – Aurora 09/2011 (2 days)
Bosch Level 1 & 2 CDR Technician Course – Greenwood Village (Kineticorp) 03/2011 (1 day)
Motorcycle Accident Reconstruction – Golden (AAR) 05/2010 (5 days)
CDR Data Analyst Course – Golden (CSI) 12/2008 (4 days)
Photo Modeler User's Course – Denver 10/2008 (3 days)
Vericom Computer User's Course – Denver 07/2008 (2 days)
Excel Based Crash Class – Golden (AAR) 05/2008 (5 days)
CDR Technician Course - Douglas County 05/2008 (1 day)
SPAR & IAFSM (Annual Conference) – Houston 03/2008 (4 days)

Scan Station Training with Avatech – Detroit 03/2008 (3 days)
 Colorado Emergency Services, Safety and Prevention Conference – Breckenridge 04/2007 (3 days)
 International Association of Forensic and Security Metrology (Annual Conference) – Houston 03/2007 (2 days)
 Traffic Crash Reconstruction Update – IPTM (Denver) 03/2007 (5 days)
 Highway – Rail Grade Crossing Collision Investigation – BNSF (Denver) 02/2007 (1 day)
 Advanced Collision Diagramming & Animation – Visual Statements (Ft. Collins) 03/2006 (4 days)
 Sokkia Total Station Training – Survey & Construction Supply (Denver, CO by Brian Aregood) – 12/2005 (1 day)
 Advanced Crash Zone – Cad Zone (Denver, CO by Anna Ristau), 12/2005 (2 days)
 Transit Rail Incident Investigation – Transportation Safety Institute (Atlanta, GA.), 06/2005 (1 week)
 Special Problems in Traffic Crash Reconstruction – Institute of Police Technology and Management (IPTM), 04/2005
 Bloodstain and Bullet Pattern Evidence Analysis – Public Agency Training Council, 06/2004 (3 days)
 Crash Conference – ARC/CSI (Las Vegas, NV.), 06/2003 (1 week)
 Advanced Collision Diagramming – Visual Statements, 05/2003 (2 days)
 Rocky Mountain Crash / DUI Conference – RMITS, 05/2003 (4 days)
 Level 4 Accident Reconstruction (Computer Aided) – Colorado State Patrol, 09/2002 (1 week)
 Motorcycle Accident Reconstruction Principles – Rocky Mountain Institute for Transportation Safety, 04/2002 (3 days)
 Crash Data Retrieval Course – IPTM, 02/2002 (3 days)
 Traffic Accident Reconstruction (Level 3) – RMITS, 07/2001 (2 weeks)
 Specialized Training in Horizontal Gaze Nystagmus – Denver Police Department (DPD), 02/2001
 Pedestrian / Bicycle Crash Investigation – IPTM, 12/2000 (1 week)
 Advanced Technical Accident Investigation (Level 2) – RMITS, 08/2000 (2 weeks)
 Intoxilyzer 5000EN Operators Course – DPD, 2000
 Police on Mountain Bikes – DPD (through the International Police Mountain Bike Association), 10/1998
 Interview and Interrogation Techniques – National Center for the Study of Unresolved Homicides, 09/1997
 Basic at Scene Accident Investigation (Level 1) – RMITS, 08/1997 (1 week)
 Motorcycle Training (Basic Course) – San Bernardino County Sheriff's Department, 07/1994
 Drug Recognition and Symptomology – Joe Klein Seminars, 06/1991

CLASSES AND LECTURES PRESENTED:

STEM School Shooting (Data Collection to Conviction) - Joint Conference (ASCR/IAFSM) – 2/15/2022
 Mass Casualty Documentation Exercise – Westminster, CO 2/14/2022
 BPA & SIR Analysis Workshop Using FARO Zone, CO Forensic Investigator Group (Thornton) – 7/2021 (3 days)
 Utilizing LiDAR and Photogrammetry-based Point Clouds for Shooting Incident Analysis - ASCR Conference, 3/2020.
 Using information from vehicles to solve shooting incidents – ASCR Annual Conference, 2/2017
 Commuter Rail/Light Rail Accident Investigation – CARTS, 03/2016
 Accident Reconstruction lecture at CSI, Regis University – 10/2009
 Basics of Collision Reconstruction for Prosecutors – Colorado District Attorney's Council, 08/2009
 Testified at Colorado House Sub-Committee hearing – HB09-1340 (Elimination of front plate), 04-2009
 Fatal Investigation for the Street Officer – International Association of Women Police 45th Annual Conference, 09-2007
 Motorcycle Accident Reconstruction Principles – RMITS 05/2004
 Traffic Collision Reconstruction, Level 3 – CARTS (annually from 2006-2011)
 Traffic Collision Investigation, Level 2 – CARTS (annually from 2006-2011)
 Traffic Collision Investigation, Level 1 – CARTS (annually from 2006-2011)
 Advanced Collision Investigation – DPD 02/2004
 Basic Collision Investigation – DPD 10/2004
 Basic Collision Investigation – RMITS (11/2003, 02/2004, 11/2004)

(Updated 10/13/2022)