

# ENGINEERING & APPLIED SCIENCES

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## Thursday

### Poster Session

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11:30 AM – 1:00 PM    **D1**    **Technology Advances in Crime Scene Investigation**  
*Massimiliano Esposito, MD\**; *Gluseppe Li Rosi, PhD*; *Elisa Pappalardo, MD*; *Monica Salerno, MD*

### Forensic Analysis/Collision Reconstruction

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Moderator: Kurt Weiss, MS

Co-Moderator: David Pienkowski, PhD

8:30 AM – 8:45 AM    **D2**    **A Method for the Evaluation of Upper Rear Vehicle Structures**  
*Brian Herbst, PE\**; *Chris Clarke, BS*

8:45 AM – 9:05 AM    **D3**    **Rear Impact Crashworthiness Defects Proven by Forensic Analysis Combined With Static and Dynamic Testing: The Failures of Seats, Head Restraints, and Belts**  
*Mark C. Pozzi, MS\**

9:05 AM – 9:20 AM    **D4**    **Mapping Vehicle Headlights to Identify the Threshold of Human Visual Performance in a Nighttime Visibility Study**  
*Jorge Mendoza, BS\**

9:20 AM – 9:30 AM    **D5**    **An Experimental Analysis of How Non-Nominal Sitting and Pyrotechnic Seat Belt Pretensioners Interact**  
*Adam Goodworth, MS, PhD\**

9:30 AM – 9:50 AM    **BREAK**

9:50 AM – 10:10 AM    **D6**    **Photogrammetry Software Used to Survey Site, Map Tire Friction Marks, and Recreate the Driver's View in Support of Alternative Collision Scenarios**  
*Kurt D. Weiss, MSME\**; *Jorge Mendoza, BSME*

10:10 AM – 10:30 AM    **D7**    **Recreational Vehicle Crashworthiness: Enhanced Injury Caused by Unsafe Vehicle Interior Structures Combined With Predictable Seat and Belt Failures**  
*Mark C. Pozzi, MS\**

10:30 AM – 10:45 AM    **D8**    **Visibility Study Uses Camera Tracking Software to Analyze Dashcam Video in a Bicycle Collision**  
*Jorge Mendoza, BS\**  
*(FSF Emerging Forensic Scientist Award Oral Presentation)*

10:45 AM – 11:45 AM    **D9**    **Slip and Fall: Methods of Simulation and Validation of a Formula**  
*Darren Franck, MSME\**; *Harold Franck, MSE\**; *Vincent D. Franck*; *Alexander Franck*

11:45 AM – 1:00 PM    **BREAK**

# ENGINEERING & APPLIED SCIENCES

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## Statistics and Machine Learning #1

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Moderator: Jatin Bodwal, MD

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| 1:00 PM – 1:20 PM | <b>D10</b> | <b>WITHDRAWN</b>  |
| 1:20 PM – 1:40 PM | <b>D11</b> | <b>Counterexamples for the Use of Spectrogram Comparison as a Method of Forensic Speaker Recognition by Law Enforcement and in Courts as Evidence</b><br><i>Jeffrey Nathaniel Holmes*</i> |
| 1:40 PM – 2:00 PM | <b>D12</b> | <b>Using Statistical Analysis to Assist With Writer Identification</b><br><i>Mike Wakshull, MS, BS*</i>   |
| 2:00 PM – 2:20 PM | <b>D13</b> | <b>Linguistics, Computer Vision, and Handwriting Identification: HANDLER</b><br><i>Carole E. Chaski, PhD*</i>   |
| 2:20 PM – 2:35 PM |            | <b>BREAK</b>  |

## Statistics and Machine Learning #2

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Moderator: Jatin Bodwal, MD

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|-------------------|------------|--|
| 2:35 PM – 2:55 PM | <b>D14</b> | <b>Presenting Model Uncertainty to Decision Makers</b><br><i>Willem A. Schreuder, PhD*</i>   |
| 2:55 PM – 3:25 PM | <b>D15</b> | <b>Graph Theoretic Techniques for Image Comparisons</b><br><i>Gautham Venkatasubramanian*; Alicia Laura Carriquiry, PhD</i>  |
| 3:25 PM – 3:30 PM | <b>D16</b> | <b>Quantitative Matching of Forensic Evidence Fragments Using Fracture Surface Topography and Statistical Learning</b><br><i>Ashraf Bastawros, PhD*; Ranjan Maitra, PhD; William Meeker, PhD; Lauren Claytor, MS, BS (FSF Emerging Forensic Scientist Award Oral Presentation)</i> |
| 3:30 PM – 3:50 PM |            | <b>BREAK</b>   |

## Innovation in Forensic Science

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Moderator: Carole Chaski, PhD

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| 3:50 PM – 4:05 PM | <b>D17</b> | <b>Innovation Fundamentals: The Prelude for Next Generation Advances in Forensic Sciences</b><br><i>David Pienkowski, PhD, MBA*; Jacklyn N. Ady, MBA, BS</i>   |
| 4:05 PM – 4:25 PM | <b>D18</b> | <b>What Researchers and Practitioners Should Know About the Forensic Innovation Ecosystem</b><br><i>Rebecca L. Shute, MS*</i>  |
| 4:25 PM – 4:40 PM | <b>D19</b> | <b>The Use of STL Technology and 3D Processing in Forensics: New Tools and a Multidisciplinary Approach</b><br><i>Gennaro Baldino, MD*; Fabio Salmeri*; Daniela Sapienza, MD*; Filippo Cucinotta; Marcello Raffaele; Alessio Altadonna; Cristina Mondello, MD; Vincenzo Cianci; Elvira Ventura Spagnolo, MD; Alessio Asmundo, MD</i> |
| 4:40 PM – 5:00 PM | <b>D20</b> | <b>Rule 702: Origins and Implications for Engineers and Attorneys</b><br><i>Gail Groy, JD*; David Pienkowski, PhD, MBA</i>   |

# ENGINEERING & APPLIED SCIENCES

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## Friday—Session I

### Poster Session

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11:30 AM – 1:00 PM    **D21**    **A Study on the Application of the Genetic Algorithm for Fall Analysis**  
*Chan-Seong Park, PhD\**

### EDR Analysis Applied to Crash Reconstruction

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Moderator: Harold Franck, MSEE

Co-Moderator: Darren Franck, MSME

8:30 AM – 9:00 AM    **D22**    **Comparing Event Data Recorder (EDR) Pre-Crash Data With UTC Time Codes in Cell Phone Records and Pre-Crash Data and UTC Data in Front Camera Modules (FCMs)**  
*Billy S. Cox\**

9:00 AM – 9:30 AM    **D23**    **Using EDR Pre-Crash Data to Evaluate Driver Behavior in Traffic Collisions**  
*Kurt D. Weiss, MSME\*; Billy Cox\*; Robert Anderson, MSBE\**

9:30 AM – 9:50 AM    **D24**    **Understanding the Limitations of EDR Data for Crash Reconstruction**  
*Brendan Bourdage, PhD\*; John Smith, MSEE, PE; Peter Alexander, PhD*

9:50 AM – 10:25 AM    **D25**    **Vehicle Wheel Speed: Did Tire Wear Lead to a Sudden Loss of Control on a Wet Road?**  
*Billy S. Cox\**

10:25 PM – 10:40 AM    **BREAK**

### Crime Investigation Techniques

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Moderator: Harold Franck, MSEE

Co-Moderator: Darren Franck, MSME

10:40 AM – 11:00 AM    **D26**    **The Detection of Blood Stains on Natural, Semi-Synthetic, and Synthetic Fabric Exposed to Extreme Environmental Conditions Using ATR/FTIR Spectroscopy**  
*Entesar Al-Hetlani, PhD\*; Zainab Hussain; Meshari Al-Qalfas; Mohamed Amin, PhD; Igor K. Lednev, PhD*

11:00 AM – 11:15 AM    **D27**    **WITHDRAWN**

11:15 AM – 11:35 AM    **D28**    **WITHDRAWN**

11:35 AM – 11:55 AM    **D29**    **The Influence of Taphonomic Changes on the Persistence of Serrations in Stab Wounds**  
*Sarah V. Hainsworth, BEng, PhD\*; Sophie A. Stanley, MBChB, BSc; Guy N. Rutty, MBBS, MD*

11:55 AM – 1:00 PM    **BREAK**

# ENGINEERING & APPLIED SCIENCES

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## Environmental

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Moderator: Kurt Weiss, MS

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| 1:00 PM – 1:15 PM | <b>D30</b> | <b>Environmental Forensic Microscopy Considering Assemblages for World Trade Center Dust and Wildfire Smoke</b><br><i>James Millette, PhD*</i>   |
| 1:15 PM – 1:30 PM | <b>D31</b> | <b>Noxious Gas Inhalations—A Lethal Occupational Hazard While Cleaning Effluent Treatment Plants in India: A Forensic Analysis</b><br><i>Jatin Bodwal, MBBS, MD*; Mohit Chauhan, MBBS; MD</i>                |
| 1:30 PM – 1:45 PM | <b>D32</b> | <b>The Ruggedness of a Kinetic Model to Predict Chromatograms of Gasoline Under Different Evaporation Conditions</b><br><i>Hannah Jewell LaVoie, BS*; Victoria L. McGuffin, PhD; Ruth Waddell Smith, PhD</i> |
| 1:45 PM – 2:00 PM |            | <b>BREAK</b>   |

## Artificial Intelligence: Machine Generated Text

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Moderator: Kurt Weiss, MS

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| 2:00 PM – 2:20 PM | <b>D33</b> | <b>Data Collection of Forensically Feasible AI-Generated Texts: The ILE AI-Generated Corpus</b><br><i>Colton B. Wolk, BS*</i>  |
| 2:20 PM – 2:40 PM | <b>D34</b> | <b>The Lexical Characteristics of AI-Generated Texts</b><br><i>Colton B. Wolk, BS*</i>   |
| 2:40 PM – 3:00 PM | <b>D35</b> | <b>The Semantic Characteristics of AI-Generated Texts</b><br><i>Carole E. Chaski, PhD*</i>   |
| 3:00 PM – 3:20 PM | <b>D36</b> | <b>The Syntactic Characteristics of AI-Generated Texts</b><br><i>Samuel Olanrewaju, MA*</i>  |
| 3:20 PM – 3:35 PM | <b>D37</b> | <b>A Statistical Authorial Modeling of AI-Generated and Human-Generated Texts</b><br><i>Carole E. Chaski, PhD*; Colton Wolk, BS; Annabelle K. Bland, BS; Samuel Olanrewaju, MA</i> |

# ENGINEERING & APPLIED SCIENCES

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## Friday—Session II

### Multidisciplinary Session: Engineering & Applied Sciences and Forensic Nursing Science

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Moderator: Kathy Bell

Co-Moderator: Paul Johnson, PhD

9:00 AM – 9:15 AM	<b>D38</b>	<b>Bone Injuries in Nursing Home Residents</b> <i>David Pienkowski, PhD, MBA*</i>
9:15 AM – 9:30 AM	<b>E20</b>	<b>Crowd Surge Triggers and Mitigating Factors</b> <i>David A. Williams, DDS, MPH*; Joyce P. Williams, DNP, MFSA, RN</i>
9:30 AM – 9:45 AM	<b>D39</b>	<b>Electrical Injury Causes: Part 2—Evidence Retention</b> <i>Helmut G. Brosz, BASc, DBA*</i>
9:45 AM – 10:00 AM	<b>E21</b>	<b>Interdisciplinary Research Related to Sexual Violence and Dating App Usage</b> <i>Emma Mae Walquist, BS*; Douglas Zytko; Michele Parkhill; Melissa M. McDonald, PhD; Kelly A. Berishaj, DNP, MSN; Wenqi Zheng, MS, BA; Xiangyu Zhou; Dongxiao Zhu</i>
10:00 AM – 10:15 AM	<b>D40</b>	<b>Powered Two-Wheeler Safety: An Experimental Analysis of Injuries and Injury Mechanisms Using Instrumented PMHS</b> <i>John H. Bolte, PhD, MSc*; Amanda M. Agnew, PhD; Yun-Seok Kang, PhD</i>
10:15 AM – 10:30 AM		<b>BREAK</b>
10:30 AM – 10:45 AM	<b>E22</b>	<b>Shaken Baby Syndrome—A Force to Be Reckoned With: A Case Review</b> <i>Janean M. Fossum, BSN*</i>
10:45 AM – 11:00 AM	<b>D41</b>	<b>What Is Known About Pregnant Occupants and Fetal Risk in Car Crashes</b> <i>Adam Goodworth, MS, PhD*; Ciboney Hellenbrand; Charlotte Bloom; Ashley Pitzen</i>
11:00 AM – 11:15 AM	<b>E23</b>	<b>"Compressed Baby Head": A New "Abusive Head Trauma" Entity?</b> <i>Enrica Macorano, MD*</i>
11:15 AM – 11:30 AM	<b>D42</b>	<b>A Child Fatality in a Vehicular Rear Impact: A Forensic Analysis and Static Testing to Scientifically Prove Seat and Belt Failures</b> <i>Mark C. Pozzi, MS*</i>