

ENGINEERING & APPLIED SCIENCES

Wednesday

Poster Session

- 11:30 AM – 1:00 PM **D1** **The Design of a Centrifugal Microfluidic Disc for the Deamination of Cytosines for Forensic Epigenetics**
*Jordan Keller, BS**; *Rachelle Turiello, MS*; *Renna Nouwairi, BS*; *James Landers, PhD*
- 11:30 AM – 1:00 PM **D2** **A Preliminary Machine Learning Study for Short Tandem Repeats (STRs) Profile Completion**
*Ciro Di Nunzio, BS**; *Aldo Di Nunzio, MS**; *Michele Di Nunzio, MSc**; *Autilia Vitiello, PhD**; *Giovanni Acampora, PhD**
- 11:30 AM – 1:00 PM **D3** **Temperature Profiling and Quantitative Analysis of Disperse Dyes in Polyester Via Direct Analysis in Real-Time Mass Spectrometry (DART®-MS)**
*Zoe Millbern, BS**; *Nelson Vinueza, PhD*
- 11:30 AM – 1:00 PM **D4** **A Study on the Application of a Human Model for the Analysis of a Fall From Height**
*Chan-Seong Park, PhD**

Thursday

Forensic and Applied Sciences

Moderator: Kurt Weiss

Co-Moderator: Darren Franck

- 8:30 AM – 9:00 AM **D5** **The Differential Performance of Dynamic Vapor Microextraction for Recovery of Ignitable Liquid Compounds Investigated Within a Sensitivity Analysis**
*Jennifer Berry, PhD**; *Mary Gregg, PhD*; *Amanda Koepke, PhD*; *Kavita Jeerage, PhD*
- 9:00 AM – 9:30 AM **D6** **Water Modeling of River Streams as a Tool for the Delimitation of Areas of Potential Disposal Sites of Missing Persons' Bodies**
Luz Perez, PhD; *Ana Carolina Guatame, MSc**; *Jorge Escobar, PhD**; *David Trujillo, MSc*
- 9:30 AM – 9:45 AM **D7** **The Perils of Using Linear Analysis for Metal Component Failures**
*Bart Kemper, BSME**
- 9:45 AM – 10:00 AM **D8** **The Effects of Land and Grooves on the Trajectory of a 9mm Bullet in a Denser Medium**
*Ali Shahid Hussain, BS**
- 10:00 AM – 10:15 AM **BREAK**
- 10:15 AM – 10:35 AM **D9** **Guessing the Twist of the Rifling of the 9mm Pistol From the Cartridge Case**
*Ali Shahid Hussain, BS**
- 10:35 AM – 10:50 AM **D10** **When Poor Knowledge of Basic Physics Results in Useless Trials**
*Alessandro Ferrero, MSc**; *Veronica Scotti, MJ*
- 10:50 AM – 11:05 AM **D11** **A Haystack Falls and Injures a Dairy Farm Worker: Forensic Testing Used to Determine the Force Required to Topple the Stack**
*Kurt Weiss, MS**

ENGINEERING & APPLIED SCIENCES

- 11:05 AM – 11:35 AM **D12** **Satellite Laboratories at the Front Line: The Canadian Border Approach to Narcotics Detection Within Postal and Air Cargo Facilities**
*Sandra Ferreira, MS**; *Chad Maheux, MS, MPA**
- 11:35 AM – 11:50 AM **D13** **Identification on the Basis of Chamber Marks of .30 Caliber Firearms**
*Ali Shahid Hussain, BS**
- 11:50 AM – 1:00 PM **BREAK**

Linguistics

Moderator: Darren Franck

Co-Moderator: Kurt Weiss

- 1:00 PM – 1:20 PM **D14** **Testing Basic Toolkits for Forensic Text Analysis: Lemmatizers**
*Carole Chaski, PhD**; *Angela Almela, PhD*; *Pascual Cantos, PhD*
- 1:20 PM – 1:40 PM **D15** **True and False Sexual Assault Victim Statements**
*Carole Chaski, PhD**
- 1:40 PM – 2:00 PM **D16** **Validation Testing of a Syntactic Authorship Identification Method Using Ground-Truth Data From 25 Authors**
*Angela Almela, PhD**
- 2:00 PM – 2:15 PM **BREAK**

Vehicles Collisions and Safety Standards

Moderator: Harold Franck

Co-Moderator: Michelle Hoffman

- 2:15 PM – 2:30 PM **D17** **Recreational Vehicle (RV) Crashworthiness: Enhanced Injury Caused by Unsafe Vehicle Interior Structures Combined With Predictable Seat and Belt Failures**
*Mark Pozzi, MS**; *Vijay Gupta, PhD*; *Jack Bish, PhD*
- 2:30 PM – 2:45 PM **D18** **The Mechanics of All-Terrain Vehicle (ATV) Rollovers**
*David Pienkowski, PhD**
- 2:45 PM – 3:05 PM **D19** **Rear Impact Crashworthiness Defects Proven by Forensic Analysis and Testing: Failures of Seats, Head Restraints, and Belts**
*Mark Pozzi, MS**; *Paul Lewis, MS*; *Kenneth Saczalski, PhD*
- 3:05 PM – 3:25 PM **D20** **Child Fatalities in Vehicular Rear Impact: Forensic Analysis and Testing to Scientifically Prove Seat and Belt Failures**
*Mark Pozzi, MS**; *Kenneth Saczalski, PhD*; *Todd Saczalski, BSMET*
- 3:25 PM – 3:40 PM **BREAK**
- 3:40 PM – 4:00 PM **D21** **The Effectiveness of Roadside Barriers in Reducing Accident Severity**
*Darren Franck, MSME**; *Harold Franck, MSEE*

ENGINEERING & APPLIED SCIENCES

- 4:00 PM – 4:15 PM **D22** **Elderly Female Side Impact: An Experimental Analysis of Side Impact Injuries Using Instrumented Postmortem Human Subjects (PMHS), Current Restraint Technologies, and Real-World Crash Boundary Conditions**
*John Bolte, PhD**; *Amanda Agnew, PhD*; *Yun-Seok Kang, PhD*
- 4:15 PM – 4:30 PM **D23** **Event Data Recorder (EDR) Data and Restraint Use: A Case Study**
*Michelle Hoffman, MS**
- 4:30 PM – 4:45 PM **D24** **Criminal Engineering: The Ugly 50-Year History of Federal Motor Vehicle Safety Standard (FMVSS) 207 and Proposals for an Upgraded Safety Standard That Will Prevent Catastrophic Injury and Death**
*Mark Pozzi, MS**; *Kenneth Saczalski, PhD*

Poster Session

- 11:30 AM – 1:00 PM **D25** **Reverse Engineering Techniques in Forensic Investigations: A New Approach to Bitemark Analysis**
*Enrica Macorano, MD**; *Valeria Santoro, PhD*; *Mariagrazia Calvano, MD*;
Federica Mele, MD; *Mirko Leonardelli, MD*; *Stefano Duma, MD*; *Giovanni De Gabriele, MD*;
Luigi Maria Galantucci, PhD; *Francesco Introna, MD*
- 11:30 AM – 1:00 PM **D26** **Microfluidics: Streamlining Ink Identification Using Mass Spectrometry**
*Morgan Demmler, MS**; *Nelson Vinueza, PhD*
- 11:30 AM – 1:00 PM **D27** **Deep Learning Models to Estimate Age and Sex From Images of the Pubic Symphyseal Surface and Greater Sciatic Notch**
*Hyun Jin Park, PhD**; *Kyubaek Yoon, MS*; *Jongeun Choi, PhD*; *Eun Jin Woo, PhD*;
Kyung-Seok Hu, DDS, PhD
- 11:30 AM – 1:00 PM **D28** **A Study of a Method for Estimating Mechanism of Injury to Children Caused by External Force: Collisions of Children With the Floor**
*Taiki Watamabe, BEng**; *Yasumi Ito, PhD*; *Yuki Kunugi, BEng*; *Issei Watanabe, BEng*;
Ryuichi Yamada, PhD; *Yoshiyuki Kagiyama, PhD*; *Tetsuya Nemoto, PhD*; *Kosuke Kurata, MS*;
Toshiyuki Harama, BEng
- 11:30 AM – 1:00 PM **D29** **The Magnetic Recovery and Mass Spectrometric Analysis of Fingermarks Contaminated With Cosmetics Products**
*Entesar Al-Hetlani, PhD**; *Sara Al-Sayed, BSc*; *Mohamed Amin, MSc*
- 11:30 AM – 1:00 PM **D30** **The Application of Environmental Design Principles in Preventing Crime and Reducing Fear of Crime in Cities: The Case of Kocaeli, Turkey**
*Tugba Unsal Sapan, PhD**; *Busra Ozen, BArch**; *Sevil Atasoy, PhD*
- 11:30 AM – 1:00 PM **D31** **Generalized Cosine Similarity for Mass Spectral Comparisons**
*Anthony Kearsley, PhD**; *Arun Moorthy, PhD*; *Matthew Roberts, PhD*; *Edward Sisco, PhD*

ENGINEERING & APPLIED SCIENCES

Friday—Session I

Multidisciplinary Session: Forensic Nursing Science and Engineering & Applied Sciences

Moderator: Jamie Ferrell

Co-Moderator: Kurt Weiss

- 8:30 AM – 8:45 AM **E17** **Nursing and Engineering Partnerships Lead to Important Advances**
*Joyce Williams, DNP**
- 8:45 AM – 9:00 AM **D32** **Rapid Isolation of Sperm From Sexual Assault Case-Type Samples Utilizing a Microfluidic Device**
Kathryn Stephens, PhD; Adam Bisogni, PhD; Gothami Padmabandu, MS; Joana Antunes, PhD; Harvey Tian, PhD; Richelle Barta, BS*
- 9:00 AM – 9:15 AM **E18** **Identifying Information in Protein From Sexual Assault Evidence**
Glendon Parker, PhD; Victoria Montgomery, MSc*
- 9:15 AM – 9:30 AM **D33** **The Detection of Saliva Stains Using Attenuated Total Reflectance/Fourier Transform Infrared (ATR/FTIR) Spectroscopy: The Effect of Surface and Time**
Entesar Al-Hetlani, PhD; Dalal Al-Sharji, MSc; Mohamed Amin, MSc; Igor Lednev, PhD*
- 9:30 AM – 9:45 AM **E19** **Right Under Our Noses: Understanding Missed Opportunities for the Collection of Saliva as Evidence**
Diana Faugno, MSN; Jessica Volz, DNP**
- 9:45 AM – 10:00 AM **BREAK**

Moderator: Jamie Ferrell

Co-Moderator: Kurt Weiss

- 10:00 AM – 10:15 AM **D34** **Wheelchair User Sues Pharmacy for Access as a Violation of the Americans With Disabilities Act**
*Robert Lynch, BArch**
- 10:15 AM – 10:30 AM **E20** **Long-Term Care Facilities (LTCFs) and Nursing Homes (NH) SARS-COV2 Infections: Inevitable Conditions or Medical Malpractice?**
Domenicantonio Iannello; Elena Forzese*; Gennaro Baldino, MD; Daniela Sapienza; Alessio Asmundo; Chiara Stassi; Elvira Ventura Spagnolo, MD, PhD; Cristina Mondello, MD, PhD**
- 10:30 AM – 11:00 AM **D35** **Electrical Injury Evidence and Sequelae**
*Helmut Brosz, BASc**
- 11:00 AM – 11:15 AM **E21** **A Descriptive Study of Non-Fatal Strangulation in Sexual Assault**
Julie Valentine, PhD, MSN; Brooke Stacey, BSN*; Leslie Miles, DNP*
- 11:15 AM – 11:30 AM **D36** **Failure of Suture Materials Used for a Cesarean Section**
*Sarah Hainsworth, BEng, PhD**
- 11:30 AM – 11:45 AM **E11** **A Collaborative Artificial Intelligence Platform for Bruise Age Analysis**
Katherine Scafide, PhD, RN; David Lattanzi, PhD, PE*; Janusz Wojtusiak, PhD*
- 11:45 AM – 12:00 PM **Questions & Answers**

ENGINEERING & APPLIED SCIENCES

Multidisciplinary Session: Digital & Multimedia Sciences and Engineering & Applied Sciences The Next 75 Years—The Application of Technology/DMS to the Forensic Sciences

Moderator: *J. Levi White*

Co-Moderator: *Christina Malone*

- | | | |
|-------------------|------------|--|
| 1:05 PM – 1:30 PM | C30 | The Possibilities of Artificial Intelligence in Digital and Multimedia Sciences AI4Forensics <i>Zeno Geradts, PhD*</i> |
| 1:30 PM – 1:50 PM | C31 | The Implementation and Testing of Triplet Convolutional Neural Networks for Forensic Image Matching: Phase I—Setting Up the Algorithm <i>Brahmani Reddy Aileni, BS; Sharon Derrick, PhD*; Ruby Mehrubeoglu, PhD</i> |
| 1:50 PM – 2:10 PM | D37 | On-Board Video Analysis Is Used to Defend a Truck Operator in the Case of a Pedestrian Killed in the Crosswalk <i>Kurt Weiss, MS*</i> |
| 2:10 PM – 2:30 PM | D38 | Research on the Deep Learning-Based Arc Melting Mark Detection Technique <i>Lim Kyu-Young, MS*</i> |
| 2:30 PM – 2:50 PM | D39 | Video Analysis Helps Defend Municipality in Bicyclist’s Impact With a Truck <i>Kurt Weiss, MS*</i> |
| 2:50 PM – 3:00 PM | | BREAK |
| 3:00 PM – 3:20 PM | C32 | A Universal Disaster Victim Identification Digital Tool for the Management of Fragmented Cross-Jurisdictional Missing Persons’ Lists and Antemortem Data in Mass Disasters With Multinational Victims <i>Shada Alsalamah, PhD*; Afrah Alotaibi, MSc; Sakher Al-Qahtani, PhD*</i> |
| 3:20 PM – 3:40 PM | C33 | Augmented Reality Applications for Craniofacial Reconstruction and Fracture Margin Assessment in Forensic Anthropology <i>Katharine Kolpan, PhD*; Jeffrey Vadala, PhD</i> |
| 3:40 PM – 4:00 PM | D40 | Forensic Human Identification From Facial and Cranial Images Using Deep Learning <i>Mario Villar, BS; Andrea Valsecchi, PhD; Pablo Mesejo, PhD*</i> |
| 4:00 PM – 4:20 PM | C34 | Potentialities of the Anatomage Table in Forensic Training and Education Programs <i>Emilio Nuzzolese, PhD*; Corrado Cali, PhD; Giancarlo Di Vella, PhD</i> |