STUDENT CAPSTONE PRESENTATION PROGRAM

APRIL 9TH, 2024

UNIVERSITY OF TORONTO MISSISSAUGA

FORENSIC SCIENCE PROGRAM

EVENT ITINERARY

8:30 AM **REGISTRATION AND COFFEE**
Instructional Centre Atrium

9:30 AM **OPENING REMARKS AND WELCOMING ADDRESS**
INSTRUCTIONAL CENTRE: IB120

STEPHANIE VEGA
Manager of Experiential Education
Office of the Dean
University of Toronto Mississauga

UNIVERSITY OF TORONTO MISSISSAUGA

FORENSIC SCIENCE PROGRAM

STUDENT PRESENTATIONS: IB120

9:40 AM **RESEARCH INTERNSHIP PRESENTATIONS**

SESSION CHAIR: GRACE GREGORY-ALCOCK

PhD Student, Department of Anthropology, University of Toronto

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Determining the effects of ultraviolet light on Leucocrystal Violet treated bloody fingerprints

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Optimization of the Seratec® AmylaseTest for forensic samples

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Validation of QIAamp Midi DNA extraction kit for post-mortem blood samples

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Brief intermission, presentations resume at 11:10 AM

FSC482 POSTER AND BOOTH SESSION

INSTRUCTIONAL CENTRE ATRIUM

Speaker Presentations Resume at 2:00 PM

FORENSIC SCIENCE AT THE UNIVERSITY OF TORONTO MISSISSAUGA

The UTM Forensic Science Program attracts some of the brightest students from across the country and the world to take part in our unique educational experience. Applied learning, combined with a first-class science degree, is the keystone of their education. All graduates of the Forensic Science Specialist Programs at UTM complete a capstone experience that applies their acquired skills and knowledge, preparing each student for the next step in their own unique career pathway.

Successful capstone experiences benefit the student, the mentor, and the agency through an exchange of ideas, learning opportunities, and new solutions for current problems.

Forensic Science Day is the culmination of these partnerships. The guidance of our mentors contributes to the growth of our students' professional skills, in combination with in-class experiences such as the submission process of ethics approval, job interview training, CV development, and a mock trial. Many of these students and their mentors present and/or publish their research at conferences and in peer-reviewed journals. It is our pleasure today to thank the mentors, and to praise the initiative and efforts of these exemplary students.

Today, we celebrate the hard work and success of our specialist degree students.

UNIVERSITY OF TORONTO MISSISSAUGA

FORENSIC SCIENCE PROGRAM

FSC481Y5

RESEARCH INTERNSHIP IN FORENSIC SCIENCE

IB120

SESSION CHAIR: GRACE GREGORY-ALCOCK

PhD Student, Department of Anthropology
University of Toronto

ELIZABETH LAWSON

Determining the effects of ultraviolet light on Leucocrystal Violet treated bloody fingerprints

ABSTRACT

Purpose: This research is intended to determine the effects of ultraviolet (UV) light on the background development of Leucocrystal Violet (LCV) treated bloody fingerprints to help establish standardized protocols and best practices in the use of LCV at crime scenes. **Background:** LCV is a blood enhancement reagent that turns purple in the presence of the heme component of blood. One of the limitations is that it may, over time, discolour the background behind the blood patterns, obscuring the foreground's details. One proposed mechanism for this states that UV light could be a factor. **Methodology:** Bloody fingerprint depletion series were placed on three substrates including tiles, hardwood, and drywall and photographed at regular intervals for three hours. This process was repeated in three lighting conditions with varying UV exposure. Colorimetry software was used to calculate the contrast change between the foreground details and the background over time where lower contrast creates greater detail obstruction. **Results:** The contrast decreased significantly during the first 20 minutes after LCV application; dropping from the average starting values of 10 to 5 and decreasing thereafter. There was a statistically significant difference between the light conditions as well as between all substrates ($p= 3.42x10^{-10}$, $3.7x10^{-8}$, and $1.5x10^{-5}$ for the no light, filtered UV, and full UV conditions; $p= 1.4x10^{-7}$, $1.7x10^{-6}$, $5.5x10^{-6}$, 0.001, on all substrates, tiles, hardwood, and drywall respectively). **Conclusion:** It is recommended that photos be taken immediately after LCV application to prevent evidence destruction.

Keywords: forensic identification, blood enhancement, bloody fingerprints, leucocrystal violet, LCV, ultraviolet light, UV light

Supervisors: Wade Knaap, Agata Gapinska-Serwin; University of Toronto Mississauga

AMBAR SANCHEZ DE LA CRUZ

Evaluating performance of Sciluminate™ powder in comparison to traditional fingerprint powders on non-porous substrates

ABSTRACT

Purpose: This research study aimed to provide recommendations to forensic identification practitioners regarding the suitability of Sciluminate™ powder for operational use. **Background:** Sciluminate™ powder, a white powder that fluoresces green, is being used in casework despite the lack of published peer-reviewed literature evaluating its effectiveness for fingermark detection. **Methodology:** Three donors deposited natural depleting fingermarks (*n* = 360) on substrates representative of large and/or immovable objects at crime scenes (varnished wood, laminate sheet, glass) and were left to age for one week. Half of each fingermark was developed with Sciluminate™ powder and the corresponding half was developed with Blitz Green magnetic or Chemist grey powder. All samples were photographed under white and respective optimal lighting for each powder. Three independent assessors evaluated all fingermarks using a modified University of Canberra comparative scale. The data was then analyzed using the Wilcoxon-signed rank test. **Results:** For all substrates, under white lighting conditions, traditional powders outperformed Sciluminate™ powder both visually and statistically. Under optimal lighting conditions, Sciluminate™ and Blitz Green magnetic powders were statistically comparable on varnished wood and laminate sheet. However, there was a significant difference favouring Sciluminate™ powder over Chemist grey powder on glass. **Conclusion:** Based on these results and other operational considerations, Sciluminate™ powder is not recommended for casework.

Keywords: forensic science, forensic identification, comparison study, fluorescence, latent fingermarks, product assessment, ultraviolet light

Supervisor: Rolanda Lam; Royal Canadian Mounted Police

JASMIN FATIMA HEMANI

Transition time of a smoldering fire to a flaming fire

ABSTRACT

Purpose: To determine the effect on transition time from a smoldering fire to flaming fire with the use of an oscillating fan. In order to develop a more accurate timeline for smoldering fires and to gain new information on the progression of fires. **Background**: A timeline provides information which allows investigators to support or refute the area of origin and cause hypotheses. Currently, no research has been done on fans and its' effect on transition time from a smoldering to flaming fire. The understanding is that transition time is variable due to increased oxygen into the smolder front. **Methodology**: 5 lit cigarettes with their cherries touching were placed on a denim pant leg and the other leg was folded over the cigarettes creating an insulated area. The denim was placed on a polyurethane couch by the armrest furthest from the entrance to a burn cell. Half of the fires set, were part of the control group and other half were part of test group. The test group had an oscillating fan turned on once the cigarette smoldered through to the denim fabric, whereas the control group did not. **Results**: The presence of an oscillating fan decreases transition time from smoldering fire to flaming fire by 24 -50%. Transition time is also dependent on temperature and humidity. **Conclusion**: It is important to consider the presence of fans when creating fire timelines as they can change the progression time of fires.

Keywords: forensic science, fire progression, fire investigation, fire timeline, smoldering fire, flaming fire

Supervisors: Jessica Reynolds; Office of the Fire Marshal

DIVYA ISABELLE ROHIT

Obtaining touch DNA from fired and unfired bullet casings: a comparative study between COPAN microFLOQ®, QIAGEN 4N6FLOQ® and cotton swabs

ABSTRACT

Purpose: COPAN's microFLOQ® swabs were compared against QIAGEN 4N6FLOQ® and cotton swabs to evaluate if DNA transfer and persistence on fired and unfired bullet casings can yield a suitable DNA profile for interpretation and comparison via conventional or direct polymerase chain reaction (PCR). This research aims to find products that maximize touch DNA from firearms cases and can aid in other scenarios containing touch DNA. **Background**: Fired casings may have low levels of DNA that are damaged or impeded because of the function of a firearm. The touch DNA can be transferred to the ammunition through the user's bare hands, leaving deposits of skin cells and debris. Transferring touch DNA may result in a DNA profile that can link an individual to a crime. **Methodology**: The sample includes 100 casings (n=100), split into 40 : 40 : 20 casings for COPAN'S microFLOQ®, QIAGEN 4N6FLOQ® swabs and cotton swabs respectively. Touch DNA was transferred to the casings, and casings swabbed by COPAN'S microFLOQ® were processed using direct PCR, and QIAGEN 4N6FLOQ® and cotton swabs were processed using conventional PCR. **Results**: The results demonstrate that variable, minute amounts of DNA may be recovered using a swab-based approach from both fired and unfired casings. **Conclusion**: This research has the potential to alter forensic scientist's approach to efficiently and accessibly collecting trace DNA when it comes to firearm-related crimes or other scenarios where touch DNA is present.

Keywords: forensic biology, casings, fired, touch DNA, swabs, unfired

Supervisors: Robert Hofstetter, Malak Elayas, Meriah Woodhouse; Peel Regional Police Forensic Identification Services
Jamie McGregor, Nicole Novroski; University of Toronto Mississauga

GABRIELA ROMO CORTES

Evaluating the impact of carryover in direct amplification substrates

ABSTRACT

Purpose: This research aims to evaluate the impact of DNA carryover when using the Applied Biosystems™ SeqStudio™ Genetic Analyzer. Performing a baseline foundational evaluation of potential carryover by determining at what DNA input ranges the instrument displayed visible carryover in subsequent profiles was determined to aid in defining the limitations and thresholds when processing samples of unknown DNA quantity. **Background:** Carryover is not reproducible or predictive when processing different quantities and qualities of DNA samples. Direct amplification substrates push the limits of the instrument, while also facilitating the assessment of limitations and thresholds for genotyping equipment employed in forensic science work. **Methodology:** One pre-extracted DNA sample (n=1) was serially diluted (from 6.1176 ng/uL to 0.61176 ng/uL (1:10) and 0.061176 ng/uL (1:100)), amplified in replicate, and genotyped to determine if carryover was observable in subsequent "blank" wells. Six touch DNA samples (n=6) were collected from different surfaces, amplified, and genotyped to assess carryover impact. Carryover was calculated by dividing the RFU value of the drop-in allele from the blank well by the RFU value of the shared allele from the sample well. **Results:** Carryover events were observed at the 5.0ng 1 and the 10.0ng 1 replicates. Kruskal-Wallis test results indicated statistically significant differences (p= 0.0003986) between the samples. **Conclusion:** Carryover can be problematic, especially at higher DNA inputs, due to irreproducibility and unpredictability, though one can re-process amplified product to differentiate between a mixture, contamination, or carryover.

Keywords: forensic science, forensic genetics, direct amplification substrates, DNA carryover, injections, STR genotyping, touch DNA

Supervisor: Jamie McGregor, Nicole Novroski; University of Toronto Mississauga

HANNAH WATSON-VAN NESTE

Optimization of the Seratec® AmylaseTest for forensic samples

ABSTRACT

Purpose: The Seratec® AmylaseTest (AMY) was investigated for optimal use on forensic suspected saliva samples. An ideal volume of AMY extraction buffer solution was tested for and used with AMY in comparison to the performance of the Seratec® AmylasePaper test (AP) and Phadebas® Forensic Press Test (PFPT) on forensic samples. These experiments will guide improvement of Seratec®'s recommended procedures. **Background:** AMY shows high sensitivity and specificity for human saliva through amylase detection. Research on AMY's forensic performance is limited. **Methodology:** AMY was performed on saliva at neat, 1/10, 1/100, and 1/1000 dilutions on cotton swab cuttings and in microcentrifuge tubes (n=48) with buffer volumes of 100µL, 300µL, and 500µL. 1/10 and 1/100 diluted saliva on both cotton-polyester and denim fabrics were tested with AMY, AP, and PFPT (n=24) using the determined optimal AMY buffer volume. **Results:** The AMY buffer volume of 100µL produced the most positive results. All buffer volumes produced some inconclusive and negative AMY results. There was no statistically significant difference between buffer volumes for test results (Chi-square; $p>0.05$). There was no statistically significant difference between test types for test results on forensic samples (Chi-square; $p>0.05$). **Conclusion:** While an AMY buffer volume of 100µL was deemed optimal in this study and showed no difference in forensic performance from PFPT and AP, the mixed results of AMY call for further investigation into the test's performance on forensic samples.

Keywords: forensic biology, presumptive saliva identification, Seratec® AmylasePaper, Seratec® AmylaseTest, Phadebas® Forensic Press Test

Supervisors: Jamie McGregor, Nicole Novroski; University of Toronto Mississauga

CASSANDRA BOUSFIELD

Validation of QIAamp Midi DNA Extraction Kit for post-mortem blood samples

ABSTRACT

Purpose: This research aims to validate the QIAamp Midi Kit as an alternative DNA extraction kit to the QIAGEN Puregene Kit used by the Ontario Forensic Pathology Service (OFPS). The DNA yield, purity, and integrity of both kits were compared. If the QIAamp Midi kit yields sufficient pure DNA, it could mitigate downstream analysis failures. **Background:** Molecular autopsies are crucial in select cases where a traditional autopsy cannot determine the cause of death. Genetic analysis requires high-quality DNA samples, which can be challenging to obtain from post-mortem samples due to decomposition. **Methodology:** DNA was extracted from forty-two post-mortem blood samples using the Puregene and Midi kit. The DNA yield and purity of each sample were determined spectrophotometrically. The DNA integrity was determined using gel electrophoresis and qPCR. Ten Midi kit samples underwent an additional re-purification. **Results:** Statistical results showed a significant difference in DNA yield and purity between the two kits ($p < 0.05$), with the Puregene kit obtaining higher yield and more pure samples. Both kits DNA showed had no significant inhibitors indicating intact DNA. The re-purification step resulted in 10% to 90% of samples meeting the purity threshold. **Conclusion:** The study indicates that the QIAamp Midi Kit could be an alternative to the Puregene kit if the re-purification step is included. Further research should explore the Midi kit's ability to undergo genetic analysis.

Keywords: forensic science, forensic biology, DNA, electrophoresis, extraction, molecular autopsy

Supervisors: Amber Manocchio, Richard Pang, Tenecia Baptiste-Carmichael; Ontario Forensic Pathology Service

COFFEE BREAK

Brief intermission, presentations resume at 11:10 AM

ZARA BAGHA

Analyzing forensic pathology textbooks for racial disparities

ABSTRACT

Purpose: The purpose of this research is to determine if there is racial bias in training materials used by forensic pathologists. By examining the diversity of skin tones in images of blunt force trauma (BFT) injuries, namely contusions and abrasions, this study investigates a potential source of bias in medical textbooks in recent use. **Background**: Previous research has indicated contusions and abrasions are not consistently recognized across 'dark' skin tones by forensic pathologists (FP). A lack of image diversity in training material, i.e. exemplar images, has been suggested as a source of this inaccuracy. **Methodology**: Seventeen textbooks available for FP education in Canada from 1996-2020, published in Canada, the US, or the UK (print or online) were used. A total of 345 images of individuals exhibiting contusions and/or abrasions were identified and scored for skin tone using the Fitzpatrick phototype scale. Individuals were scored as 'light', 'medium', or 'dark' skinned. **Results**: Scoring indicated that images examined were of 72% 'light', 25% 'medium', and 3% 'dark' skin tones. Further, when examined across 5-year intervals from 1996-2020, no change in their proportion was noted (Chi-Square: X2=14.966, d.f.=8, p=0.059818). **Conclusion:** This research indicates an under-representation of 'dark' and 'medium'-skinned exemplars of BFT in FP training materials, suggesting a bias in available training images. Given the potential for error this poses, further research should examine the impact of poor BFT recognition on the accuracy of autopsy results/death certifications.

Keywords: forensic science, forensic pathology, abrasions, autopsy accuracy, contusions, death certification, diversity, race, training materials, textbooks

Supervisors: Lilia Watamaniuk; University of Toronto Mississauga

SARAH KAY EVES

Skeletal evidence of structural violence in South Asia

ABSTRACT

Purpose: This research evaluates whether there is skeletal evidence of structural violence consistent with the oral stories of the origins of teaching skeletons through the morphological assessment of health and disease. The significance of this research is to learn more about these individuals' experienced embodied social inequity and the degree of alignment with oral stories. **Background**: Structural violence is preventable harm or damage to persons resulting from the unequal distribution of power and resources. Oral stories exist regarding the unclear origins of the teaching skeletons. If these individuals are from lower castes in South Asia who were economically disadvantaged, their bones should reveal evidence of structural violence. **Methodology**: A sample of 30 teaching skeletons were analyzed for 21 skeletal stress markers in four broad categories of: nutritional deficiencies, disease, injuries, and occupational stress. Biomarkers were evaluated first, followed by age estimation, and sex assessment. Chi-square and Odds ratio were used to compare frequencies in males and females, and to a comparative skeletal sample from St. Mary's Anglican Church. **Results**: A Chi-square test showed no sex differences in biomarkers (all $p>0.05$). For the biomarkers between groups, all were found to be significant ($p<0.05$). The odds of experiencing tooth loss during life is 3.9 times more likely in the South Asian sample. **Conclusion**: Reaching a state of tooth loss suggests a lack of access to healthcare. The South Asian population surpassed the threshold for structural vulnerability relative to a healthier population.

Keywords: forensic science, forensic anthropology, caste system, marginalization, structural violence

Supervisor: Tracy Rogers; University of Toronto Mississauga

KELLY WONG

New method for mandible estimation in facial approximation of mandible-less remains

ABSTRACT

Purpose: The purpose of this research is to create an accurate and easy method for mandible estimation of mandible-less skulls in 2D forensic facial approximations. Formulae from Ide and Rynn (2020) are used to estimate the mandibular dimensions, along with alignment landmarks from Pavlidis (2023) to correctly position the mandible on a sample of individuals of the same sex. This research is significant as it will aid forensic artists in generating representative facial approximations of mandible-less skulls which may increase the likelihood of obtaining a positive identification for missing individuals. **Background**: The mandible is often missing from the skull in forensic cases which can be problematic for facial approximations as current methods for mandible estimation have low accuracy, are difficult to perform, and do not account for mandible positioning on the skull. **Methodology**: Measurements from 20 adult male skulls with little to no damage were collected and used to estimate mandibular dimensions. 2D facial approximations of the mandible and its position on each skull were generated by a forensic artist. CloudCompare was used to analyze discrepancies between the actual mandible and the approximated drawing. **Results**: Preliminary results show an accuracy of 71% for the overlap between the actual mandible and the approximated drawing. **Conclusion**: There is potential for this method to be used by forensic artists in cases of mandible-less skulls. Future research should test the reliability of this method across different forensic artists and its accuracy on female skulls.

Keywords: forensic science, forensic facial approximation, facial identification, forensic facial reconstruction, forensic artist, missing mandible estimation

Supervisor: Duncan Way; Ontario Provincial Police

IENAS ABDULAZIZ

Scapular measurements for estimating stature in skeletal remains using computed tomography scans on individuals of unknown ancestral affiliation

ABSTRACT

Purpose: This research aims to develop a metric method for stature estimation from the scapula. This study examines individuals of unknown ancestral affiliation using post-mortem computed tomography (CT) scans from the New Mexico Decedent Image Database (NMDID). **Background:** Accurate stature estimation, regardless of ancestral background, aids in identification efforts. This method uses non-invasive CT scans, efficient in jurisdictions that conduct post-mortem CT scans. **Methodology:** Four measurements of the scapula were collected from 100 CT scans (50 male, 50 female) of known biological sex, age and stature, including fully developed adults 23-65 years of age. Individuals with deformities, injuries, or diseases were excluded. Assessing Inter- and intra-observer errors on side differences, univariate and multivariate regression analysis was conducted to derive predictive stature equations, and a validation process was conducted to test the accuracy of equations showing a significant correlation with stature (p <0.05). **Results:** No statistically significant differences were found between left or right scapulae (p >0.05); seven regression equations showed significant correlation with stature (p <0.05). Accuracy of cross-validated equations ranged between 50%-100% with six achieving >80% accuracy. **Conclusion:** Scapulae may contribute to stature estimation on individuals with unknown ancestral affiliation, particularly in cases where better predictors, such as long bones, are unavailable.

Keywords: forensic science, forensic anthropology, stature estimation, biological profile, computed tomography (CT), scapula, metric, non-population specific, human identification

Supervisors: Shelby Scott; University of Toronto Mississauga

ANA KHAN

The effects of burial containers on skeletal preservation in long-term graves

ABSTRACT

Purpose: The purpose of this research is to determine the impact that various burial containers and the size of an individual have on bone preservation in long-term graves (i.e., more than 30 years) by examining dog burials, to offer recommendations for estimating post-mortem interval in regions with comparable climate and soil conditions. **Background**: Decomposition research often concludes upon reaching the skeletal stage, and while valuable, the outcomes derived from these studies consequently lack applicability to skeletal remains. Likewise, preservation research frequently draws conclusions from historic sources, thus limiting applicability to forensic contexts. **Methodology**: The sample used in this study consisted of 14 domestic dogs *(Canis lupus familiaris),* buried between 1974-1987. Individuals were sorted into two categories of size based on estimations of shoulder height. Preservation was scored according to a skeletal preservation system, which categorized 5 escalating stages of preservation (where "1" indicated well-preserved bone and "5" indicated bonemeal). **Results**: Chi-Square tests, Fisher's exact tests, and a Kruskal-Wallis test suggested that neither burial container nor size had an effect on the level of preservation exhibited ($p>0.05$ for all tests). **Conclusion**: While the findings of this study imply that level of skeletal preservation may not be influenced by burial container or size in long-term burials, it is imperative for future research to substantiate and validate these observations, with enhanced study designs and broader sampling strategies.

Keywords: forensic science, forensic anthropology, burial containers, long-term burials, post-mortem interval and PMI, skeletal preservation

Supervisors: Tracy Rogers, Trevor Orchard; University of Toronto Mississauga

JINZE (MICHAEL) WANG

Validation of Recon-3D app for clandestine and mass grave documentation

ABSTRACT

Purpose: This study aims to evaluate the applicability of the Recon-3D app in clandestine and mass grave(s) documentation. This research is significant as it assists forensic anthropologists in making an informed decision regarding Recon-3D as a low-cost alternative for clandestine and mass grave documentation. **Background:** The current research regarding Recon-3D covers bloodstain pattern analysis, collision investigation, and bullet trajectory documentation. However, no study has been done regarding grave(s) documentation. **Methodology:** Two clandestine graves and one mass grave were utilized. The graves contained mannequins and skeleton props with various markers for measurements. Six repeated Recon-3D scans were made for each grave and compared against the Terrestrial Laser Scanner (TLS) control using the average absolute error (AAE) and standard deviation. Data analysis was conducted using the CloudCompare software for measurement accuracy, as well as additional metrics such as scan time. **Results:** The average scan time with Recon-3D for clandestine and mass graves was almost 9-14x less than TLS. Known measurements within the clandestine graves had an average absolute error (AAE) of 1.2 cm and a standard deviation of 1.0 cm. The mass grave measurements had an average absolute error (AAE) of 3.5 cm and a standard deviation of 6.1 cm. **Conclusion:** The Recon-3D app provided measurements which were useful for clandestine grave documentation. The app proved to be several times faster, simpler to use, and at a much lower price point, giving organizations/agencies greater access to 3D documentation tools.

Keywords: crime scene documentation, 3D laser scanning, 3D documentation, clandestine graves, LiDAR, mass graves, Recon-3D

Supervisors: Eugene Liscio; ai2-3D Forensics

SIMONA MANCINI

Assessing the accuracy and reproducibility of the Insta360 1-Inch RS camera for 3D crime scene reconstruction over the FARO S350 laser scanner

ABSTRACT

Purpose: This research aims to compare the overall accuracy in detailing, reproducibility, and user-friendliness between the Insta360 1-Inch RS camera and the FARO S350 laser scanner. **Background**: Photogrammetry is a non-destructive technique used alongside 3D technologies to analyze measurable data through photo and video imaging. The Insta360 1-Inch RS camera, a 360-degree camera, can capture the entirety of surrounding areas from a capture point. The FARO-S350 laser scanner, a ground-truth scanner, uses phase comparison to produce enhanced digital details. **Methodology**: A car collision was constructed by positioning two cars diagonally across from each other with a body dummy placed in front of the vehicles. Using the Insta360 1-Inch RS camera, 5 trials of video recordings (0.5 timelapse) and photographs (3 second intervals) were taken and analyzed using CupixVista (CV), Cloud Compare (CC), and 3DF Zephyr (Z), respectively. The scanned data of the crime scene from the FARO S350 laser scanner was provided and analyzed through Cloud Compare using point picking. **Results**: Error analysis was conducted in Microsoft Excel to compare the 360 camera results to the laser scanner. The following are the concluded average errors: 0.0176 m (CV) and 0.1270 m (Z). **Conclusion**: Videos were more successful than photos, with a 0.11 STD. While the Insta360 1-Inch RS camera has qualitative benefits, the FARO S350 laser scanner is more accurately advantageous for 3D crime scene reconstruction.

Keywords: 3D crime scene reconstruction, photogrammetry, 360 camera, laser scanner, photos, videos, accuracy, reproducibility, user-friendliness, measurement data, forensic identification

Supervisors: Eugene Liscio; ai2-3D Forensics

LUNCH BREAK

An 80 minute recess at the Blind Duck, UTM Student Centre.

Forensic Science Day resumes at 1:00 PM with the Poster Session in the Atrium of the (IB) Instructional Centre.

Note: The Poster Session is open, and overlaps with lunch.

POSTER SESSION

60 minutes in the Instructional Centre Atrium.

Speaker presentations resume at 2:00 PM

Note: The Poster Session is open, and overlaps with lunch.

EMILIE ADES

Perception of 'Coercive Control' and its implications for violence risk communication: a vignette study

ABSTRACT

Purpose: This research investigates how context and messaging affects the ability to detect and perceive coercive control (CC), the perception of risk and hypothetical police actions. University students were surveyed to learn how people understand CC and establish how to educate the public and police. **Background**: CC is a form of intimate partner violence characterized by a pattern of tactics to control an individual. Canada is considering criminalizing CC. To bring charges, CC must be recognized, assessed, and documented effectively. There is limited understanding about perception by those outside of the abusive relationship. **Methodology**: 8 vignettes depicting CC were assigned randomly, manipulating the presence of physical violence, the inclusion of victim perspective and presence of a pattern of behavior. Respondents answered questions about their perception of harm, risk and recommendation of intervention. **Results**: Significant effects were observed between the presence of physical violence and selected criminal penalty ($p<0.01$), intervention ($p<0.005$), and perceived abnormality ($p<0.019$). Participants selected more serious criminal penalties and interventions when physical violence was present. 95% identified that an offense had occurred based on the proposed legal definition even when no pattern of behavior was observed. **Conclusion**: Participants struggled identifying elements of the legal definition and treated scenarios with violence more seriously. Education must be focused on the severity of CC even in the absence of physical violence as well as the detection and documentation of behavioral patterns.

Keywords: forensic science, forensic psychology, coercive control, intimate partner violence, risk communication

Supervisor: Zoe Hilton; Waypoint Centre for Mental Health Care

ALEXANDRA HAWSE

Proposal of improved items for inclusion in the Brief Jail Mental Health Screen

ABSTRACT

Purpose: This research revises the Brief Jail Mental Health Screen (BJMHS) by identifying items from the Jail Screening Assessment Tool (JSAT) associated with referral to secondary mental health treatment, minimizing false positives and ensuring timely intervention for inmates. **Background**: Mental illness is prevalent in prisons, necessitating early detection. While the BJMHS is commonly used, it often yields false positives. Integrating effective JSAT items into the BJMHS offers a potential solution to enhance screening accuracy. **Methodology**: Data from the Forensic Early Intervention Service database, comprising referrals from two Ontario prisons (n=13,000), were analyzed. Chi-square tests assessed the relationship between responses to BJMHS and JSAT items and referral to treatment. Logistic regression identified the most predictive JSAT items. **Results**: Among male inmates, responses indicating previous treatment (OR=2.752, 95% CI [2.574, 2.939]), depression (OR=1.239, 95% CI [1.091, 1.406]), distractibility (OR=1.617, 95% CI [1.369, 1.907]), elevated mood (OR=2.020, 95% CI [1.667, 2.448]), hallucinations (OR=2.762, 95% CI [2.529, 3.022]), suspiciousness (OR=2.480, 95% CI [2.234, 2.753]), and tension (OR=1.872, 95% CI [1.707, 2.050]) were significantly associated with increased referral likelihood. For female inmates, responses indicating hallucinations (OR = 2.01, 95% CI [1.50, 2.90]), suspiciousness (OR=1.61, 95% CI [1.10, 2.20]), and tension (OR=1.71, 95% CI [1.20, 2.30]) were significantly associated with increased referral likelihood. **Conclusion**: Integrating JSAT items into the BJMHS shows promise for enhancing screening accuracy in correctional facilities. Gender-specific variations in predictive factors underscore the need for tailored interventions. Future research should validate the proposed item list.

Keywords: forensic science, forensic psychology, assessment, brief jail mental health screen, correctional mental health

Supervisor: Cory Gerritsen; Centre for Addiction and Mental Health

CHANTEL HOUSTON

Assessing the consistent and equitable application of the high-risk designation in Canada's Not Criminally Responsible Reform Act

ABSTRACT

Purpose: To evaluate whether the designation of high-risk added to the *Criminal Code* is used consistently and equitably by Canada's judicial system. Demographics and variables in British Columbia, Ontario, Québec, and New Brunswick Review Board (RB) cases were examined from the implementation of the *NCR Reform Act* (2014) to January 1st, 2024. The significance is to understand whether the high-risk designation attempts to challenge the balance between public safety and liberty interests of the accused. **Background**: There is a lack of research surrounding the reform, and controversy stems from the lack of consultation with forensic mental health professionals and RB members and the lack of empirical evidence that public safety will be improved at the expense of lengthier hospitalization. **Methodology**: Fourteen cases, identified through Lexis Quicklaw, involved the Crown successfully seeking a high-risk designation. Data, including demographics (age, sex, prior psychiatric/criminal history), RB authority duration, designation headings, index offence, duration of designation, referral to the Superior court by the RB, and designation revocation, were extracted from these cases. Relationships were analyzed using chi-squares and a regression. **Results**: Each HRA has a prior psychiatric history. Most HRAs have a criminal record, and the majority have committed a crime against and not against a person. There is a statistically significant difference in HRA designations between provinces ($X^2 = 10.571$; $df = 3$, $p = 0.014$). Inconsistencies exist among the Crown, not specifying designation headings. **Conclusion**: The high-risk designation is not being consistently and equitably used.

Keywords: forensic psychology, forensic mental health system, high-risk accused, Not Criminally Responsible Reform Act

Supervisor: Michael Feindel; Ontario Review Board

RIANNA RAMANA

Factors that contribute to the renewal of a conditional discharge when an absolute discharge is being sought

ABSTRACT

Purpose: The purpose of this research is to identify what factors lead to the renewal of a conditional discharge when an absolute discharge is being sought. Ontario Review Board (ORB) dispositions were reviewed and coded. This research offers evidence-based recommendations on how to improve psychological interventions and helps lawyers advise their clients under the jurisdiction of the ORB. **Background**: Past research identified factors that impact the length of time an individual spends under the ORB. Seven factors identified are the severity of the index offence, length of time spent in detention, type of mental disorder diagnosis, the clinician and ORB agreement on risk, previous conditions/privileges granted, psychiatric history and aggression/self-harm. **Methodology**: Using Lexis QuickLaw the search terms "conditional discharge" AND "absolute discharge" AND NOT "detention" OR "detain" were searched under the section for ORB dispositions. Dispositions that occurred between January 1, 2018 to January 1, 2023 and met the studies inclusion criteria were reviewed. The seven factors mentioned were scored as present (1) or absent (0). The final sample size was n=212. **Results:** A Chi Square test showed that p=0.000001. A Cramer's V of 0.43443 was obtained. **Conclusion:** The ORB weighs the opinion of the clinician, the individuals' symptoms, their level of insight into their mental disorder and history of adherence to medication heavily. Lawyers should consider these factors when preparing for a disposition. Psychological interventions should focus on psychoeducation to increase one's insight into their mental disorder.

Keywords: forensic science, forensic psychology, Ontario Review Board, not criminally responsible on account of mental disorder, conditional discharge, absolute discharge

Supervisor: Craig Fraser; Ontario Review Board

MELISSA SPYKER

Improving the Canadian criminal justice system: a systematic review

ABSTRACT

Purpose: Investigate whether two recommendations for improving the Canadian criminal justice system have the potential to ameliorate correctional outcomes: (1) specializing correctional staff training to include psychological aspects of crime and rehabilitation, and (2) establishing an institutional structure that more closely resembles un-imprisoned life. This research is significant as it will help map current understanding, inform future research, and promote development of correctional policy supported by evidence-based practice. **Background:** Psychological learning theory supports rehabilitative approaches as the best method for dealing with crime, although current uses of restrictive and retributive correctional practice foster a maladaptive culture of punishment. Aligning practice to reflect psychological knowledge of human conduct and learning is crucial in ensuring that the Canadian legal system can operate efficiently. **Methodology:** Scholarly databases were screened for studies examining the influence of correctional features under examination on offender characteristics and outcomes. 26 articles were identified from which data was extracted and critically analyzed. **Results:** A significant gap in literature, pertaining to the impact of specialized correctional staff training on offender outcomes, was identified. Preliminary results regarding the effect of prison characteristics indicate offender responsivity is influenced by the physical aspects of their living space and environment. **Conclusion:** Initial findings suggest that recommendations may be promising. Future research is required to better understand efficacy in a Canadian correctional context.

Keywords: forensic psychology, correctional practice, evidence-based practice, prison conditions, psychological learning theory

Supervisor: Honourable Justice Richard Schneider; Ontario Court of Justice

LOVELLE PONG

A scoping review of professional credibility bias in expert witness testimony

ABSTRACT

Purpose: The purpose of this research is to explore existing knowledge about professional credibility bias in expert witness testimony, including any recommendations on how to mitigate this bias in court. A scoping review is conducted using peer-reviewed literature and grey literature, with the latter restricted to Canadian court cases. This research is significant, as it will provide information that assists in the prevention of unchecked expert biases impacting legal cases. **Background**: Professional credibility bias occurs when an expert remains loyal to an opinion due to their professional interests, such as protecting their credibility after making an erroneous opinion. This bias was recently discussed in Canadian court cases, whereas limited peer-reviewed literature has mentioned this specific bias. **Methodology**: Peer-reviewed literature and grey literature were collected from the following electronic databases: APA PsycINFO, Web of Science, Scopus, Lexis Advance Quicklaw, and CanLII. Inclusion was assessed based on the set criteria and the relevancy of the source to the research question. Data screening was organized with the use of the Zotero referencing software, then imported into the NVivo 12 software to assist with qualitative analysis. **Results**: A total of 452 sources were identified in the database search, with 22 (n=22) included in the scoping review. This research is ongoing. **Conclusion**: The number of identified literature signifies a necessity for the legal community to conduct further research regarding professional credibility bias in expert testimony.

Keywords: forensic science, law, expert witness bias, expert witness testimony, professional credibility bias

Supervisor: Liesha Earle; Ontario Ministry of the Attorney General

COFFEE BREAK

Brief intermission, presentations resume at 3:20 PM

HANIA AMIR

Social determinants of health and equity in rehabilitation among individuals with traumatic brain injury who intersect with the criminal justice system

ABSTRACT

Purpose: This scoping review explores the extent to which equity and social determinants of health (SDoH) are considered in rehabilitation for individuals with traumatic brain injury (TBI) who intersect with the criminal justice system (CJS). By identifying trends, this research informs opportunities to advance considerations for equity and SDoH in rehabilitation. **Background**: A previously published review identified that rehabilitation programs/services were providing support to individuals with TBI who had intersected with the CJS. However, the extent to which equity and SDoH were considered in these programs was not systematically explored. **Methodology**: A systematic search of online databases for peer-reviewed publications, websites for grey literature, and reference lists of eligible studies identified 27 peer-reviewed articles and 2 gray literature reports that satisfied predetermined inclusion criteria. Data on equity and SDoH were extracted from included literature. A descriptive numerical summary and qualitative content analysis were conducted to examine the extent to which equity and SDoH were considered in these rehabilitation programs/interventions. **Results**: 20.7% (6) articles described rehabilitation that considered equity and SDoH. Of nineteen equity and SDoH variables, 10 were considered. **Conclusion**: Considerations of SDoH and equity were limited within rehabilitation programs/services. The review highlights inconsistent reporting of some determinants as an obstacle for understanding outcomes in diverse samples, and points to the use of education on equity and SDoH as a tool for improvement in rehabilitation programs/services.

Keywords: forensic psychology, criminal justice, knowledge synthesis, social determinants of health, traumatic brain injury, health equity

Supervisors: Vincy Chan; KITE Research Institute, University Health Network

ANU KASUMU

Health equity considerations within rehabilitation literature for individuals experiencing homelessness and traumatic brain injury

ABSTRACT

Purpose: This scoping review addresses a knowledge gap in traumatic brain injury (TBI) rehabilitation research that discusses social determinants of health (SDoH) for individuals experiencing homelessness, guiding future research on effective screening, education, & training for healthcare providers working with homeless populations. **Background**: SDoH include non-medical factors (i.e. income, education) that influence rehabilitation efficacy. Individuals experiencing homelessness commonly suffer from numerous illnesses, mental and physical, leading to higher mortality rates. TBI significantly correlates with homelessness, exacerbating these challenges. To successfully rehabilitate those experiencing homelessness and TBI, their disadvantages should be addressed. **Methodology**: Studies were pulled from databases by an information specialist, screened for inclusion/exclusion criteria, and underwent peer review prior to data extraction. SDoH information from each article was documented in a charting table. A thematic analysis was conducted. **Results**: After screening and peer review, 18 of the initial 568 articles were included. Religion, characteristics associated with discrimination, occupational health, and healthy behaviours were not considered. Place of residence was discussed most, followed by ethnicity and gender. **Conclusion**: Based on preliminary results, certain SDoH are discussed in TBI rehabilitation literature, while others are neglected. Future research should investigate how healthcare access, screening, and services for vulnerable communities can be amended to better address their needs.

Keywords: forensic science, forensic psychology, homelessness, rehabilitation, scoping review, social determinants of health (SDoH), traumatic brain injury (TBI)

Supervisors: Vincy Chan; KITE Research Institute, University Health Network

AIMEN ZEHRA

Scoping review for Road to Type 2 Diabetes Prevention: a community-based diabetes screening intervention

ABSTRACT

Purpose: The purpose of this research is to explore evidence on community-based screening for type 2 diabetes through a scoping review. Its goal is to aid the development of a type 2 diabetes screening program in Peel Region. **Background**: Type 2 diabetes has rising rates globally due to factors such as lifestyle changes. In Peel Region, approximately 1 in 6 people are living with diabetes and approximately 69% of the population belong to high-risk ethnic groups. Early detection is crucial in these communities as delayed diagnoses can contribute to increased mortality. **Methodology**: The review follows Arksey and O'Malley as well as Levac et al. frameworks, adhering to PRISMA-ScR guidelines. A comprehensive search strategy was developed to target original peer-reviewed studies from 2000 to 2024, in addition to a grey literature search. Exclusions included studies focused on those living with diabetes and secondary research. Screening utilized Covidence software, with data extraction on a structured template in Microsoft Excel. **Results**: 31 studies were identified with 12 different screening sites using 13 different point-of-care devices. Challenges included engagement barriers, while effective strategies included leveraging community trust. Recommendations for future initiatives focus on culturally sensitive participant recruitment. **Conclusion**: This review offers key insights by identifying gaps, barriers, and successful strategies in different settings and populations. These findings can guide the development of an evidence-based screening intervention, ultimately aiming to reduce the burden of type 2 diabetes in Peel Region.

Keywords: community-based interventions, diabetes screening, early detection, effective screening, public health, type 2 diabetes

Supervisor: Ghazal Fazli; Novo Nordisk Network for Healthy Populations

POSTER SESSION
PRESENTERS LIST

FSC483H5:

COLLABORATIVE RESEARCH INTERNSHIP

DANIYAH ALI

Jury secrecy and public trust: a comparison of Canada and the U.S

ABSTRACT

Purpose: The purpose of this research is to determine how public trust changes depending on whether jurors are permitted to disclose deliberations publicly. Trust is imperative for sustaining the administration of justice and public engagement in legal institutions, however, there is limited research examining public trust in Canada. **Background**: Under a closed system, Canadian jurors are prohibited from disclosing their deliberations while American jurors are permitted to reveal their deliberations publicly. Ratings of public trust using the Jury System Trustworthiness Scale (JUST) are predicted to be lower in the Canadian system based on past findings. **Methodology**: 59 University of Toronto students completed a Google Forms survey for a comparative analysis of trust between jury systems. Participants rated their levels of trust in the Canadian and the American system using the JUST scale when provided with a description of each. **Results**: A Wilcoxon signed-rank test showed a statistically significant difference in the average JUST scores between systems ($W = 1573$, $p < .001$) for an effect size of $d = 0.903$. Higher JUST scores were found for the Canadian system than in the American system. **Conclusion**: Participants had higher levels of trust in the closed Canadian system which contrasted with previous findings of trust in a transparent American system. National labels, participant bias, sampling style and research design are factors implicated in the contradicting findings. Future research may consider the use of cross-national samples and removal of national labels.

Keywords: forensic science, forensic psychology, American justice system, Canadian justice system, confidentiality, public trust, jury trial, jury deliberations

Supervisor: Caitlin Pakosh; Ontario Ministry of the Attorney General

JASON YAP, SIMRAN SANDHU, NOAH ANDREW, KYRA VAN BIESEN, KATIE BUI

Assessing the effect of hemp products on detection of THC in the oral fluid

ABSTRACT

Purpose: The purpose of this research is to determine if hemp products can lead to a false positive result for tetrahydrocannabinol (THC) on the SoToxa™ Mobile Test System and the Dräger DrugTest® 5000. This allows for the evaluation of the suitability of these instruments for presumptive roadside drug testing in Canada. **Background:** Since the legalization of recreational use of cannabis in 2018, there have been concerns regarding drug-impaired driving. There is also a gap in research investigating possible interfering substances for THC using the aforementioned instruments. This study looks to expand on previous research by testing for hemp as an interferant, as it is derived from the same plant as cannabis. **Methodology:** Interferants tested included three different types of hemp products. Two samples of oral fluid, one for each instrument, were collected from each participant (n=40) prior to the usage or consumption of the products. The participants then used or consumed one of the three interferants and the collection and analysis process was repeated. **Results:** There were no positive results in any of the participants for all three substances tested, which results in a 0% false positive rate. **Conclusion:** The results showed that the approved drug screening instruments have high specificity for THC, which provides valuable information about their reliability as a screening tool for the investigation of impaired driving.

Keywords: forensic science, forensic toxicology, Dräger DrugTest® 5000, false positive, hemp, oral fluid, SoToxa™ Mobile Test System, tetrahydrocannabinol (THC)

Supervisor: Karen Woodall; University of Toronto Mississauga

MARAL AZIZPOUR

Jury secrecy and public trust: a comparison of Canada and the U.S.

ABSTRACT

Purpose: The purpose of this research is to determine how public trust is impacted depending on whether a jury system is open or closed. Having trust in the jury system leads to increased participation in the system as well as overall confidence in verdicts. **Background**: The Canadian jury system follows a closed approach in that deliberations and reasonings for verdicts cannot be discussed publicly. In contrast, the U.S. system follows an open approach wherein jurors may talk about deliberations post-trial and give reasoning for verdicts. Based on previous research, it is predicted that there will be more public trust for an open jury system. **Methodology**: In order to measure public trust, the Jury System Trustworthiness Scale (JUST) was adapted into an online Google Forms survey. A comparative analysis was performed on a total of 59 undergraduate University of Toronto Mississauga students, regarding levels of trust held for both the Canadian and American jury systems. **Results**: A Wilcoxon Signed-Rank Test finds a statistically significant difference between average JUST ratings of the two systems ($W = 1573$, $p < .001$) for an effect size of $d = 0.903$. JUST scores were significantly higher for the closed, Canadian system compared to the open, American system. **Conclusion**: Participants show greater trust towards the closed system, contradicting previous literature which finds support for the open jury system model. Sampling and experimental designs may explain these inconsistent findings. Future recommendations include avoiding any national labels.

Keywords: forensic science, forensic psychology, Canadian legal system, comparative analysis, jury systems, public trust, confidence

Supervisor: Caitlin Pakosh; Ontario Ministry of the Attorney General

ELIZABETH BOCSA, MARYAM DAWOOD

Drug-facilitated sexual assaults (DFSA): examining the impact of toxicological evidence among Ontario-based court cases

ABSTRACT

Purpose: This study explores the impact of expert evidence within Ontario-based drug-facilitated sexual assault cases (DFSA). We investigate whether the presence of an expert toxicologist can influence case verdict, after controlling for other courtroom variables. **Background**: The DFSA landscape has seen low reporting, prosecution, and conviction rates due to the sensitivity and ambiguity of evidence presented in cases. Most studies on DFSA have not focused on the impact toxicological results and testimony have on judicial authorities, but on the mechanics of drug consumption. **Methodology**: Through the LexisNexis database, records of DFSA cases held in the Ontario Superior Court of Justice from 2014-2023 (n=74) underwent analysis of key factors such as case citation, presence of either a Crown or defence toxicologist, gender (of the accused and victim), and the drug found. Using IBM SPSS Statistical Software, a logistic regression model was used to determine the odds of a given verdict in the presence of a key factor. **Results**: The binary logistic regression revealed that none of the variables presented statistically significant evidence to support the odds of achieving a guilty verdict. However, this can mainly be attributed to our very limited sample size and the overall difficulty of systematically measuring any confounding variables that can impact trial outcomes. **Conclusion**: Further study would need to be conducted with an expanded sample and a wider variety of cases to effectively isolate the impact of toxicological evidence on DFSA cases.

Keywords: forensic science, forensic toxicology, sexual assault, drug-facilitated sexual assault, drug, expert testimony, Ontario

Supervisors: Caitlin Pakosh; Ontario Ministry of the Attorney General. Karen Woodall, University of Toronto Mississauga

YUENING CHEN

Initial validation of point cloud data from body-worn cameras

ABSTRACT

Purpose: This research aims to conduct an initial validation footage from body-worn cameras to generate accurate three-dimensional (3D) models. Accurate models can aid in preserving the crime scene, enabling accurate & reliable feature measurements, and revealing post-crime modifications. **Background**: Research in this area is limited, yet crucial, considering the goal of the Canadian government to equip frontline officers with this camera. **Methodology**: Three different body-worn camera models recorded a total of thirty 35-to-45-second videos in two different resolutions outdoors. These videos were then analyzed using 3DF Zephyr photogrammetry software for point-to-point comparison, with each reconstructed point cloud scaled based on the longest distance from the reference model. This research focused on comparing distances between selected points in the reconstructed models against ground truth. **Results**: Maximum mean error recorded was 14.42 cm for ABFLEX2 in 720P resolution. One-sample t-tests revealed significant differences between the distances measured in the ABFLEX2 models and the ground truth ($p < 0.05$). Two-sample t-tests showed no significant differences in measurements of different camera resolutions ($p>0.05$). Single-factor ANOVAs demonstrated significant differences in measurements of different camera models ($p<0.05$). **Conclusion**: Resolution did not correlate with measurement error between the ground truth and the reconstructed model. However, the camera model may have contributed to measurement error. Except for ABFLEX2, AB2 and AB3 appeared to enable accurate and reliable feature measurements.

Keywords: data validation, Axon, 3D-data, data acquisition, Faro, photogrammetry, point clouds, 3D laser scanning, 3D reconstruction

Supervisor: Eugene Liscio; ai2-3D Forensics

KIERAN DUMOUCHEL

Methodological exploration and considerations for sex estimation in subadult: impact of using different methods of dental age estimation

ABSTRACT

Purpose: The purpose of this research is to show if the comparison of the Ubelaker (1978) and AlQahtani et al. (2010) methods on subadult deciduous teeth can accurately identify age of the subadults tested. **Background**: Age estimation is an important part of a Biological Profile as it can majorly narrow down the search to who a person was. Studies have shown an accurate way to age subadults from their skeleton to add to a Biological Profile is through their dentition. Subadult age estimation can be done through a dental assessment which compares dentition in the human skull to drawings of dentition to assess age of the individual studied. **Methodology**: Sample size collected is 88 individuals as provided by Dr. Sanchez aged 8-20. This includes subadults, aged 8-18 and adults 19-20 were added in as a control to prove the two methods used work normally on adult dentition. The two methods selected were Ubelaker and AlQahtani et al. The detailed recordings of the dentition were provided from data collected by Dr. Sanchez. **Results**: AlQahtani et. al overestimated age and mainted an even spread of ages, while Ubelaker sorted dentition into three major categories: 10, 15, & 20. **Conclusion**: Users should be cautious of AlQahtani et.al over aging tendencies and Ubelaker's method should not be used on adolescents as there is no recordings of ages 16-19. Sexual dimorphism can be misconstrued if dental age assessment is off using faulty age assessment methods.

Keywords: forensic science, forensic anthropology, bioarchaeology, biological profile, dentition, subadult, sexual dimorphism

Supervisor: Jose Sanchez; University of Toronto Mississauga

CHERYL FUNG

Using 3DF Zephyr to determine body camera position

ABSTRACT

Purpose: This research aimed to determine how accurately 3DF Zephyr, a three-dimensional crime scene reconstruction software, could pinpoint the originating position of a camera through filmed video. **Background**: Validating body camera position currently relies solely on witness reports, an unreliable source of information. Thus, this research aimed to provide a more accurate method using photogrammetry. Photogrammetry had recently started being used as a method of forensic documentation of objects and crime scenes to prevent the loss of potentially important information. **Methodology**: The Axon Body 3, Body 2, and Flex 2 were each tested with three trials each, five measurements per trial. A three-dimensional reconstruction of a mock crime scene was created from each body camera video with 3DF Zephyr. The FARO laser scanner was used to obtain ground truth data. Coordinates of the camera positions from each of the 5 predetermined points were recorded and compared to ground truth coordinates. **Results**: Body 3 showed an average error of 8.4 cm. Body 2 showed an average error of 11 cm. Flex 2 showed an averaged error of 7.6 cm. The total average error was 9 cm with a standard deviation (σ) of 5 cm. The radius of a circle around the center of a lens would be 24 cm (9 cm + 3σ). **Conclusion**: Pinpointing camera position allowed the originating position of an officer to be determined as within 24 cm radius circle, accounting for 99.7% of all errors.

Keywords: forensic science, forensic engineering, 3D forensics, photogrammetry, camera position

Supervisor: Eugene Liscio; ai2-3D Forensics

FARIS HASSOUNA

Jury secrecy and public trust: a comparison of Canada and the U.S.

ABSTRACT

Purpose: The purpose of this research is to see if public trust in jury trials changes if jurors can reveal what happens during deliberation. Increasing public trust ratings has been linked to greater participation in the legal system. Therefore, any insight into factors that influence public trust can be helpful to know. **Background**: Jurors in Canada are not allowed to disclose information on what occurred during deliberation. This is in contrast to the United States wherein jurors are allowed to disclose this information after the trial is over. Based on previous research, it is predicted that Jury System Trustworthiness Scale (JUST) scores will be lower for the Canadian legal system. **Methodology**: A comparative analysis using a Google Forms Survey with the JUST scale was used on 59 participants at the University of Toronto. Respondents were asked to rate their trust in the Canadian system and then the American system. **Results**: A Wilcoxon Signed-Rank Test finds a statistically significant difference between average JUST ratings between the deliberation systems ($W = 1573$, $p < .001$) for an effect size of $d = 0.903$. JUST scores were significantly higher for the Canadian (Closed) system than the American (Open) model. **Conclusion**: Respondents appeared to trust the Canadian system more, contradicting previous findings that suggest the American model garners greater trust ratings. Sampling and experimental designs are considered as explanations for these inconsistent findings. Recommendations for future research avoiding national labels are suggested.

Keywords: forensic science, forensic psychology, Canadian legal system, comparative analysis, jury systems, public trust

Supervisors: Caitlin Pakosh; Ontario Ministry of the Attorney General

LATHURSHA KALARANJAN

Reliability of HemoVision for expirated pattern analysis

ABSTRACT

Purpose: The purpose of this research is to compare the true and calculated area of origin (AO) of expirated blood spatter using HemoVision, in order to determine the accuracy of the software. This research is significant as it will establish the reliability of non-invasive and time-efficient technology for expirated pattern analysis. **Background**: Expirated patterns are formed when blood is pushed out of an opening in the human body (i.e., mouth) by the force of air (i.e., cough). HemoVision can be used to perform bloodstain pattern analysis (BPA) to identify the AO. There is a lack of research looking into virtual expirated pattern analysis. **Methodology**: Four combinations of distances (20cm, 40cm) and angles (90°, 45°) were defined. Five 5mL expirated patterns were created per combination (n=20). Patterns were photographed and analyzed in HemoVision to estimate the AO. The average differences in each direction (XYZ) and their 3D vectors were plotted. **Result**: One-sample t-tests of the 3D vectors found statistically significant differences between the sampled and hypothesized mean (μ=0) at 90° and 20cm (x=11.6, p=5.78e-4), 90° and 40cm (x=22.5, p=4.72e-6), 45° and 20cm (x=13.7, p=9.84e-4), and 45° and 40cm (x=28.7, p=3.19e-5). **Conclusion**: This indicates a statistical difference between the true and calculated AO. Therefore, HemoVision may not be an appropriate tool for investigators dealing with expirated patterns. The notable difference in the Z coordinate indicates possible limitations in analyzing expirated patterns through virtual software.

Keywords: forensic science, forensic identification, area of origin analysis, bloodstain pattern analysis, expirated pattern, HemoVision software, virtual crime scene investigation

Supervisor: Eugene Liscio; ai2-3D Forensics

JENNAVIEVE KYLE

Methodological consideration for sex estimation in subadults: Testing the use of vertebrae for subadult sex estimation

ABSTRACT

Purpose: This research aims to explore sex estimation in subadults, using vertebral methods previously established in adults utilizing the 1st cervical (C1), 12th thoracic (T12) and the 1st lumbar vertebra (L1). **Background**: Sex estimation is one of the essential parameters in forensic anthropological casework. Recently, sex estimation using the vertebral column has been explored in adults. A combination of measurements of the first cervical vertebra, twelfth thoracic vertebra and first lumbar vertebra have been the most reliable for purposes of sex estimation in adults. The use of vertebrae for sex assessment has only been studied in adults. There is a need for investigation of subadult sex estimation and sexual dimorphism using the vertebrae. **Methodology**: The sample consists of 30 randomly selected individuals, age 6-20, from the New Mexico Decedent Imaging Database with equal distributions of male sex at birth and female sex at birth individuals. The measurements are of C1, T12 and L1. The measurements are as follows; Cervical: a) (CHT), b) (CAP) and c) (CTR). (Thoracic: a) (VL) and b (sBDcm). Lumbar: (a) (EPWu), (b) (PHI), and (c) (EPDm). **Results**: Three discriminate function analysis equations were utilized. Characteristics CHP and CTR were utilized. Preliminary results show a 50 % accuracy of sex estimation for each equation in individuals 6-9 years of age. Final results are pending. **Conclusion**: Preliminary analysis indicates there is no identifiable degree of sexual dimorphism in individuals 6-9 years of age. Further investigation is required.

Keywords: forensic science, forensic anthropology, subadult, vertebrae, sex estimation, sexual dimorphism

Supervisors: Jose Sanchez, Shelby Scott, Tracy Rogers; University of Toronto Mississauga

NINA LE

HemoVision: area of origin in cessation cast-off patterns

ABSTRACT

Purpose: The study examined twenty-five machine-generated cessation cast-off patterns (CCOPs) using HemoVision (HV) to estimate the area of origin (AO). **Background:** A CCOP occurs when blood drops are released from an object due to sudden deceleration. Analysts determine the AO by examining trajectory convergence, providing insight into a weapon's approximate location. While previous research has applied HV to analyze impact bloodstain patterns, this study introduces an objective approach for interpreting CCOPs. **Methodology**: Five trials were conducted for each wooden rod with various diameters (10, 20, 30, 50, and 70mm). The rod ends were immersed 100mm into blood to mechanically produce CCOPs on paper, positioned vertically under the cast-off rig. X, Y, and Z-measurements were taken from the corner of the paper. The calculated AO was positioned at the center of the diameter, 50mm from the rod ends. The CCOPs were photographed with overview and detail markers, then imported into HV to ascertain the actual AO. The average error (AE) and average total error (ATE) between the X, Y, and Z-measurements of the actual and calculated AOs were calculated for each rod. **Results**: The smallest rod (10mm) showed the lowest AE for the Y-measurements (AE-Y=-125.64mm) and the highest ATE (ATE=128.94mm). Other rods had AE and ATE measurements below 50mm. **Conclusion**: Y-measurements span 100mm, but the study specified a value of 50mm. Y-measurements within ±50mm are within the acceptable range. On average, HV can locate a weapon to within a few centimeters.

Keywords: forensic science, forensic identification, area of origin, bloodstain pattern analysis, cessation cast-off

Supervisors: Eugene Liscio; ai2-3D Forensics

YING XIAN (WINNIE) LIN, JACQUELINE NAGAL, CONNIE TU

Impact of toxicological evidence among Ontario-based court cases (2014-2023)

ABSTRACT

Purpose: The purpose of this research is to investigate the relationship between the presence of forensic toxicological evidence in a trial and the outcome of DFSA cases in Ontario over the past ten years. **Background**: Forensic toxicological evidence plays an important role in drug-facilitated sexual assault (DFSA) trials. Victims of DFSA are vulnerable and often have trouble providing testimony due to memory loss or shame. Instead, forensic toxicologists are called to provide expert evidence to assist the trier of fact with reaching a verdict. Many studies have reviewed common trends in forensic toxicological findings from DFSA cases, but none have explored the impact of forensic toxicological evidence on the verdict of DFSA cases. **Methodology**: Previous DFSA trials from Ontario over a ten-year period (February 2014 to December 2023) accessed through LexisNexis Advance Quicklaw (n = 74) were analyzed. The presence or absence of toxicological evidence, if the Crown or the defence hired the evidence, and if the verdict was a conviction or an acquittal, were recorded. **Results**: A chi-square test of independence showed no statistically significant difference in the verdict with the presence or absence of toxicology evidence from either the Crown or the defence (2 x 3 contingency table: X^2_1 = 1.8276, P = 0.401). **Conclusion**: Analyses indicate there is no discernible relationship between the presence of forensic toxicological evidence (from either party) and verdict outcomes in Ontario's drug-facilitated sexual assault cases over the past decade.

Keywords: forensic science, forensic toxicology, drug-facilitated sexual assault, expert evidence, LexisNexis

Supervisors: Karen Woodall; University of Toronto Mississauga. Caitlin Pakosh; Ontario Ministry of the Attorney General

SACHNOOR SAHNI

Jury secrecy and public trust: a comparison of U.S. and Canadian jury systems

ABSTRACT

Purpose: The present study aims to gauge public trust in the Canadian jury system as it relates to jury secrecy laws through a comparative analysis with the American jury system. This will provide novel insights into trust in Canadian juries and the relative impact of prohibiting jury transparency using a side-by-side comparison. **Background**: Trust in the justice system is crucial to maintain democracy and encourage public involvement in the administration of justice. This is particularly true for jury systems where citizens play an active role in criminal proceedings, but limited research has been conducted in the Canadian context. Contrary to the United States, Canadian jurors are prohibited from disclosing details of the deliberation process. **Methodology**: 59 Canadian university students completed an online survey in which they read a short description of the confidential or transparent nature of each jury system. Participants rated their trust in each system using the Jury System Trustworthiness scale. **Results**: A Wilcoxon signed-rank test showed a significant difference in average trust ratings for each system ($W = 1573$, $p < .001$) with a large effect size ($d = 0.90$). Trust in the Canadian jury system was significantly greater than the American system. **Conclusion**: Contrary to expectations, jury secrecy may increase public trust in the system when its intended purpose is explained. Future research should address sample limitations and explore other areas of the legal system that can be improved to enhance trust.

Keywords: forensic science, forensic psychology, Canadian justice system, jury secrecy, jury transparency, legal trustworthiness, public confidence

Supervisors: Caitlin Pakosh; Ontario Ministry of the Attorney General

CHRISTINA SHEPPARD-GREENHOW

Camera calibration of Axon body cameras using PhotoModeler

ABSTRACT

Purpose: This research compared camera calibration parameters of three models of Axon body cameras; Flex 2, Body 2 and Body 3, using photogrammetry software PhotoModeler, by capturing videos of target patterns and applying footage to software. This be used to determine which camera model is the most effective at collecting footage by on-scene police officers. **Background:** Photogrammatery is a widely used tool in forensics for crime scene and evidence reconstruction. However, very little research has been conducted into the use of Axon body cameras and comparative camera calibration. **Methodology:** Five body cameras from each model (Flex 2, Body 2 and 3) collected video of target pattern sheets. This footage was then converted into 12 frames and calibrated using PhotoModeler. **Results:** The calibrations were compared based on the parameters of focal length, principal point, and lens distortion. Standard deviations between the parameters are insignificant, with the lowest deviation being the lens distortion of the Body 2 cameras (K1=0.006). Body 2 demonstrates most consistent deviations of all camera models, and has the lowest deviation of the focal lengths, at 0.068 pixels. **Conclusion:** As part of a collaborative research project, the results of this research complement a tandem investigation of creating point clouds to determine location of camera, in relation to a specific point at a scene. Understanding camera calibration of various Axon models will guide any necessary improvements for the camera.

Keywords: forensic science, law enforcement, body cameras, camera calibration, crime scene investigation, policing

Supervisors: Eugene Liscio; ai2-3D Forensics

SHELBY SOLDWISCH

The accuracy of SynthEyes at determining a body camera's position

ABSTRACT

Purpose: The purpose of this research is to investigate how accurately the SynthEyes software can determine a body camera's position by establishing known positions in a scene and comparing them to those reported by the software in order to generate novel information regarding SynthEyes' error. **Background**: SynthEyes is a software used for matchmoving – the virtual three-dimensional (3D) recreation of a camera's path from its footage. It is becoming a common tool for scene reconstruction in forensic settings, though minimal research has been conducted regarding the error of SynthEyes for determining a camera's position. **Methodology**: Eight known camera positions were established in a scene and recorded with a FARO Focus Laser Scanner (n = 8). Using Axon Body 2, Body 3, and Flex 2 body camera models, footage was taken in the scene while stopping at the eight positions and repeated twice for each model. The footage was then uploaded into SynthEyes for matchmoving. The positions reported by the software were compared to the known positions by calculating the 3D distance error. **Results**: The total 3D distance error range was 19.0–153.1 cm, with the y-coordinates producing the highest error and the z-coordinates producing the lowest error. **Conclusion**: SynthEyes produces a large error range with regards to a camera's position. It is most accurate at determining a camera's height and least accurate at determining a camera's depth. These findings can better inform the use of SynthEyes for forensic scene reconstruction.

Keywords: forensic science, forensic engineering, 3D scene reconstruction, matchmoving, SynthEyes

Supervisors: Eugene Liscio; ai2-3D Forensics

POSTER SESSION
INFOGRAPHIC PRESENTERS LIST

FSC485H5:

EXPERIENTIAL OPPORTUNITY IN FORENSIC SCIENCE

SALIHA ASIM

Global perspectives on crime: insights from international criminology studies in Italy

ABSTRACT

Experience: A 4-week summer abroad program in Sienna, Italy was completed through the University of Toronto. Titled *Current Issues in International Criminology*, it granted a full year credit. **Background**: This opportunity is available to all UofT students in good standing who meet the eligible criteria. The course presented research regarding North America and Europe, encouraging students to compare various criminal justice systems, and examine the scientific principles and techniques to issues relevant to the law. **Contents**: This course covered nine topics including: Cross-national patterns of crime and violence; the mafia and the growth of international organized crime; immigration, crime, and crime control; hate crime; street gangs and youth violence; radicalization and "homegrown" terrorism; international patterns of gendered violence; corporate crime within the international economy; and international trends in crime prevention & punishment. Evaluation included a reflective paper on human trafficking and a literature review on drugs and violence. Field trips were taken to a police station, maximum security prison, and forensics unit/immigration processing centre. **Results**: This opportunity made a valuable contribution to the student learning as it enhanced understanding on topics related to forensic science on a global scale. It contributes to career aspirations in law enforcement by demonstrating proactivity and ongoing education. **Conclusion**: This was a memorable experience and is highly recommended for students who are looking to diversify their learning.

Key Words: forensic science, forensic psychology, international criminology, global crime trends, summer abroad program

Instructor: Scot Wortley; Centre for Criminology and Sociolegal Studies, University of Toronto

JUANITA DAVID

Exploring the interconnections of speech, language, and psychology

ABSTRACT

Experience: A research assistant work-placement was completed at the Sounds of UTM laboratory. The main role was to cooperatively conduct an online study under the supervision of a principal investigator, exploring the impact that language backgrounds have on vocal imitation differences in children aged 7.5 to 10 years old in North America. **Background**: This experience was obtained as part of the Work Study Program offered at UofT. This opportunity takes place during the full academic year and is open to students enrolled at the university. **Contents**: Within this role, the research assistant would recruit participants for the study, and communicate with parents of participants. Tasks also included aiding in setting up of the physical lab space on campus and providing voiced instructions for online experiments. Several skills were acquired such as experiment building, working with Microsoft Excel, UI and UX design, vocal analysis, and professional communication through engaging with coworkers. **Results**: This experience has provided valuable skills and networking opportunities, as well as increasing confidence in pursuit of career ambitions in speech-language pathology/audiology. **Conclusion**: This placement was critical to the professional and academic growth of a graduating student, and will be continued at the lab for the foreseeable future. This experience is recommended to all students interested in research-based opportunities within the university.

Keywords: linguistics, speech production, phonetics, language studies

Supervisor: Jessamyn Schertz; University of Toronto Mississauga

ANTONIO FRAGOMENI

Ontario Transfer Services Inc.

ABSTRACT

Experience: An opportunity working with the *Ontario Transfer Services Inc*. provided experiences in the transfer of deceased individuals from the locations of their death to the appropriate location, such as the Office of the Chief Coroner or partnering funeral homes. **Background**: The field of deceased transfer services is an excellent opportunity to gain more insight on the death industry. The Ontario Transfer Services Inc. offers work and volunteer opportunities, including those for students looking into gaining experience or knowledge if interested in pursuing a career within forensic pathology. **Contents**: The experience included attending various types of transfer calls including house calls, coroner calls, hospital calls, and long-term care unit (LTCs) calls. The deceased individuals were picked up and transferred to the appropriate locations for body preparation or autopsy and analysis. **Results**: This opportunity allowed for strengthening and developing skills of communication, compassion, empathy, critical thinking, problem solving, and adaptability. It provided experience in interacting with deceased individuals which will be beneficial in careers within forensics, specifically forensic pathology, forensic anatomy, and forensic identification. **Conclusion**: Pursuing an opportunity within the field of body transfer is highly recommended as it is an area within the death industry that is not heavily exposed. Students can gain a hands-on experience with communicating with professionals in the field and interacting with deceased individuals.

Keywords: deceased individuals, coroner, body transfer technician forensic pathology

Supervisors: Brenda Capolupo; Ontario Transfer Services Inc.

GIULIANA LARSEN

Forensic Identification Services: The Real C.S.I

ABSTRACT

Experience: Over 100 hours were completed as an intern for the Peel Regional Police's Forensic Identification Services. **Background:** This opportunity, at Peel Regional Police's 22 Division, included observing and assisting Forensic Identification Officers (F.I.O) during their daily duties, attending tours and other unique opportunities. Students participating in a forensic science program that requires a capstone experience are eligible to apply for this time-flexible experience that can provide the foundational skills needed for those that are interested in becoming Forensic Identification Officers. **Contents:** During this internship, a unique skillset specific to the field of investigation was gained, including crime scene photography, forensic chemical enhancement methods, fingerprint analysis, evidence collection, packaging, documentation, and investigative report writing skills. Additionally, administrative skills included making evidence submissions to the Centre of Forensic Sciences, and how to query police databases. Skills gained in professionalism included networking, time-management, and effective communication. The highlight of the experience was utilizing these skills in order to process evidence from mock crime scenes. **Results:** This internship has offered a valuable contribution to learning and career growth by providing extensive opportunities to ask questions and gain direct, practical experience in the field. **Conclusion:** Overall, this opportunity is recommended to students who would like to pursue a career in Forensic Identification or law enforcement.

Keywords: forensic identification, fingerprinting, evidence collection

Supervisors: Robert Hofstetter, Malak Elayas, Michael Ho; Peel Regional Police

GRACE LEE

Pathway to proficiency: an observership & forensic conference

ABSTRACT

Experience: A 2-day observership was completed at the University Health Network (UHN), where the work of pathology assistants was observed. Throughout the year, online courses were completed from Forensic Technology, complemented by virtual attendance of the 2024 NIJ Research & Development Symposium. **Background**: The observership is open to all university students with approval from the UHN in any medical department throughout the year. Students can gain insight about job responsibilities in their field of interest. The webinars and conference cover various topics in Forensic Science and provide a certificate of completion for students to demonstrate their knowledge. **Contents**: The observership included commuting to Toronto General Hospital with 8 hours each day spent working closely with pathology assistants. The experience allowed the sharpening of laboratory skills, learning specific skills like specimen preparation and tissue cutting, and networking with healthcare professionals. The webinars and conference facilitated updating with the latest forensic advancements and research. The webinars taught development of resiliency as a forensic professional and critical thinking skills in forensic cases. **Results**: Both opportunities provided the necessary skills to contribute to professional and personal growth, solidifying the goal of becoming a pathology assistant. **Conclusion**: This observership is highly recommends to future capstone students as it provides exposure to the medical field and suggests completing the webinars to enhance their skill set.

Keywords: observership, online webinars, forensic conferences

Supervisors: Martin Grealish; University Health Network

CHLOE-RUNAN LI

Gaining Valuable Skills through Workshops: FSC485H5

ABSTRACT

Experience: Two workshop classes were completed, namely the Phlebotomy Workshop and the Intramuscular Injection Workshop, along with the Standard First Aid with CPR-C full course. Certificates were successfully obtained. A final infographic was created for the Forensic Science Day 2024 program. **Background:** FSC485H5: *Professional Opportunity in Forensic Science* allows students comparatively more freedom to choose their own unique experiential learning experiences in their capstone year. **Contents:** The Phlebotomy Workshop equipped participants with the abilities to perform blood collection and methods to mitigate possible complications. The Intramuscular Injection Workshop provided participants with the skills to administer medications via the intramuscular route. The Standard First Aid with CPR-C full course equipped students with the skills to handle various medical emergencies, such as choking scenarios, heart attacks, etc. **Results:** This experience has fulfilled its goal in offering a valuable contribution to the personal and professional development of the student. **Conclusion:** FSC485H5 is recommended for upcoming capstone students, as it can allow them to gain valuable skills and knowledge that align with their interests, which can also be utilized for their prospective careers.

Keywords: phlebotomy, blood collection, intramuscular injection, first aid, healthcare, workshops, experiential learning, certificate, certification

TINA LIN

Volunteering with York Regional Police and training in a firearms safety course

ABSTRACT

Experience: A placement as a Rovers Crew and Events volunteer at the York Regional Police (YRP) offered learning opportunities about policing. A 2-day firearms safety course with the Firearms Safety Education Service of Ontario (FSESO) was also completed, resulting in the granting of a firearms license. **Background:** The YRP volunteer opportunity is offered annually from September to June and is open to individuals ages 14 to 26. The firearms safety course is a 2-day course offered in-person at various Ontario locations. Individuals of all ages may take this course, however, individuals under 18 must have parental consent. Both opportunities provide learning about law and hands-on experience in the real world. **Contents**: In the YRP opportunity, volunteers assist events hosted by the YRP and Scouts Canada. Volunteers also learn about policing through training at the Community Safety Village, touring YRP units, and working alongside YRP personnel. In the firearms course, students learn how to handle, load, and store non-restricted and restricted firearms. After the 2nd day, students must take a written and practical examination, in which they may apply for a firearms license if passed. **Results**: Both opportunities contributed to professional and personal development through valuable networking opportunities and the strengthening of critical skills. **Conclusion**: The emphasis of 'scouts' more than policing would be unfit for forensic students, and thus not recommended. The firearms safety course is highly recommended, especially for individuals interested in applying for police agencies.

Keywords: volunteering, policing, scouts, firearms, firearms license, in-person course

Supervisors: Dana Bourdages, Kirsten Heard; York Regional Police. Mike Ratych; Firearms Safety Education Service of Ontario

JEFFREY LOK

Peer mentorship professional opportunity at Youth Assisting Youth

ABSTRACT

Experience: A peer mentor volunteer position was completed at the non-profit organization *Youth Assisting Youth*, aiding 'at-risk' youth with developmental, social, or emotional challenges by helping them develop life skills and build confidence. **Background**: This opportunity is offered to individuals between the ages of 16 to 29 who live within the Toronto or York Region area, and who can commit to mentoring on a weekly basis for 1 year. This opportunity is helpful for the field of forensic psychology as it focuses experience in areas such as child protection and social work, and in this position, experience is gained through the opportunity to help individuals struggling with their mental health. **Contents**: Training includes several sessions covering the common struggles faced by youth, and strategies to resolve said struggles. Mentoring consisted of outings and recreational activities with the mentee. The purpose of outings was to build a relationship with the mentee to be able to serve as a peer that they could speak to about their struggles to provide them with as much assistance as possible. This was facilitated by incentives like free tickets to sports games provided by the organization. **Results**: This opportunity was useful because it helped build transferable skills that will be useful to any future endeavors including communication, leadership, and critical thinking. This opportunity was a hands-on learning experience that helped spark growth in a way that would not be possible in an academic setting. **Conclusion**: This opportunity is recommended to future students as a fulfilling role, providing assistance to a population who may not receive enough support elsewhere in their lives, beneficial as a learning experience for both the mentee and mentor.

Keywords: positive role-modelling, child behaviour management, youth mental health, child abuse awareness, diversity

Supervisors: Jennifer Cyr; Youth Assisting Youth

KENNEDY MARTYN

Excavating a medieval cemetery in Transylvania, Romania

ABSTRACT

Experience: A four-week bioarchaeology field school, the Lost Churches Project, was completed in Transylvania, Romania. The field program, titled *Medieval Funerary Excavation, Living and Dying on the Edge of Europe* was offered through the ArchaeoTek Research Centre. **Background**: This field school is offered in two sessions running June through August. Participants are not required to have previous osteology, or field experience however it is recommended. Participation in a bioarchaeology field school contributes to the field of forensic anthropology as the techniques utilized are transferable between fields. **Contents**: The field season ran during the month of July 2023, in Patakfalva, in which medieval cemetery burials were excavated from Monday to Friday, 8am until 5pm. During this time, the experience included the excavation, exhumation, and documentation of two burials. Upon excavation, the burials were determined to be those of a child and an adolescent, respectively. Weekends were free to explore the culture and history of Transylvania, such as Dracula's Bran Castle. **Results**: Experiences such as field schools allow one in the field of anthropology to explore their aptitude for field work and gain hands-on excavation skills. The opportunity to travel internationally is irreplaceable for students looking to increase their global awareness academically and personally. **Conclusion**: For any student interested in forensic anthropology or bioarchaeology, participation in a field school is highly recommended to gain increased experience in excavation and osteological techniques.

Keywords: forensic science, forensic anthropology, bioarchaeology, excavation, field school, international experience

Supervisors: Jonathan Bethard, Zsolt Nyaradi, Renee Reinman; ArchaeoTek

BRENDAN NEWTON

Cracking code and elucidating eyes: research in forensic and complex trait genetics

ABSTRACT

Experience: Brendan Newton worked as a Research Assistant in the Forensic & Complex Trait Genetics lab at the University of Toronto Mississauga. He worked on independent and collaborative research projects in statistical genetics with a focus on pigmentation genetics as it relates to forensic DNA phenotyping. **Background**: The Forensic & Complex Trait Genetics lab conducted research in statistical genetics and bioinformatics in forensic, anthropologic, and psychiatric contexts. This experience has helped to form a strong foundation in research design, population genetics, and computational science that will support higher education and a career in research. **Contents**: Brendan is currently conducting a genome-wide association study of grey eye colour in >12,000 Canadians to learn about which genetic variants contribute to a lack of melanin. Other highlights include a first author publication (Forensic Science International: Genetics) and a poster presentation at the 2023 Northeastern Association of Forensic Scientists annual meeting. **Results**: This opportunity was invaluable in developing the computational skills, network, and publication experience necessary for a career in research. **Conclusion**: This experience is strongly recommended for those wanting research experience in computational biology or population genetics.

Keywords: research, genetics, statistics, pigmentation

Supervisors: Cristina Abbatangelo, Esteban Parra, Frank Wendt; University of Toronto Mississauga

PETER PATSAKOS

The future landscape of forensic science

ABSTRACT

Experience: In pursuit of academic and professional development, two experiences were completed. The first involved completing the online course "Forensic Psychology and Witness Investigation." The second included attending the "Forensic Science in Canada: An Evolving Community" conference. **Background:** The eight-week online course, completed in the summer of 2023, was provided by The Open University situated in the United Kingdom. This course is accessible to anyone seeking a foundational understanding of forensic psychology. The conference was organized by the Canadian Society of Forensic Science (CSFS) from June 2nd to June 5th, 2023. CSFS holds conferences to facilitate international collaboration. These experiences enabled Peter to evaluate perspectives on forensic practices within his chosen field of forensic psychology. **Contents**: The online course emphasized witness testimony and crime scene investigation. Interactive elements such as video-based tasks were also implemented. In addition, learning about methods used in the U.K. added a unique aspect to Peter's learning. At the conference, Peter attended a workshop on career readiness for forensic science students. He also participated in scientific and plenary sessions were professionals discussed their specialized fields. **Results:** Peter's participation in these experiences helped him achieve his goals of developing his academic learning and professional development by attaining professional certifications. **Conclusion**: Completing these experiences has been a positive experience that Peter highly recommends to fellow students as it provides a unique opportunity to immerse yourself in the diversity of forensic science.

Keywords: online course, forensic psychology, United Kingdom, eyewitness testimony, conference, Canada, certification

Supervisors: Graham Pike; Canadian Society of Forensic Science

RAI-ANNA SAMUDA

Issues in mental health law in Ontario

ABSTRACT

Experience: A course was completed, offered by the Centre for Addictions and Mental Health (CAMH), entitled 'Legal Issues in Mental Health in Ontario'. **Background**: The course was a six-week asynchronous online course that was a part of CAMH's continuing education program meant for mental health professionals already in the field to stay up to date on best practices for when an individual with mental health issues encounters the law. Future career ambitions included pursuing a career as a psychotherapist, specializing in forensic populations, which was the focus of this course. **Contents**: The six weeks were split into six modules; legislation governing mental health care in Ontario, admission to a psychiatric facility, treatment in a psychiatric facility, the Ontario Consent and Capacity Board, discharge and community treatment orders, and privacy. Completion of the course required 3 to 4 hours a week dedicated to reviewing course content, weekly posts on the course discussion board, and an end of class evaluation. **Results**: This experience has provided an in-depth view into what her future as a mental health clinician specializing in forensic populations will entail. **Conclusion**: Overall, the experience was both insightful and enjoyable. It is recommended for individuals who would enjoy an in-depth view into a future career where mental health and the legal system interact.

Keywords: mental health, legal issues, mental health law

Supervisors: Neil Gregson; Legal Aid Ontario. Ritu Gupta; Centre for Addictions and Mental Health

MACY SMITH

Criminal defense law: an experiential opportunity

ABSTRACT

Experience: A 12-month co-operative education program in criminal defense law was completed at at Bellan Law. **Background:** This program is offered to students at the discretion of the mentor; Ms. Bellan tailors the program to each student and collaborates with them to create a personalized curriculum and schedule. It can be completed year-round, as Ms. Bellan selects active trials and tasks pertinent to the student's interests. This program contributes to the field of forensic psychology as it allows students to gain valuable court experience and engage in the application of psychology to law. **Contents:** This program enables students to engage in court procedures and the roles of a trial lawyer by allowing them to attend court proceedings, complete statement transcriptions, attend client meetings, assist with pre-trial literature reviews, and assist with evidence retrieval. Students can network with and shadow other members of the criminal justice system through this program, including justices of the peace. **Results:** This opportunity fulfilled its goals of offering a valuable contribution to the student's learning and career growth by providing the student with networking opportunities, field experience, opportunities for the practical application of psychology, and further professional development. **Conclusion:** The Bellan Law co-operative education program is a valuable experiential opportunity for forensic science students and is recommended for those with a distinct interest in the intersection of psychology and law.

Keywords: criminal defense law, co-operative education program, forensic psychology

Supervisor: Carrie Bellan; Bellan Law

SURINA VAID

Justice for the innocent

ABSTRACT

Experience: An internship was completed at Innocence Canada, working alongside Pamela Glatt, Director of Education, to create educational resources highlighting the causes of wrongful convictions in Canada. **Background**: Innocence Canada is a non-profit organization that advocates for wrongfully convicted individuals. The internship at Innocence Canada was remote and acquired through the collaboration between Professor Caitlin Pakosh at the University of Toronto Mississauga and Pamela Glatt at Innocence Canada. The internship took place from January to April 2024. Students interested in this professional opportunity can share their interests with the Department of Forensic Science at the University of Toronto Mississauga. This internship aligns with career aspirations in law, as the work involves learning about the Canadian legal justice system, analyzing case details, and reading legal documents. **Contents**: Completion of a research assignment examining the central forensic science issues in thirty exoneree cases. Networking with lawyers, professors, and law students to better understand how legal documentation is used to support appeals and applications. **Results**: Strengthening critical thinking and communication skills while networking and collaborating with professionals was a core outcome of the experience. This internship also enabled exploration of career goals. **Conclusion**: This opportunity is recommended to students who are passionate about advocating for justice, interested in criminal law, and want to learn about Canada's judicial system.

Keywords: Innocence Canada, internship, networking, researching, forensic science, wrongful convictions, Canada's legal justice system

Supervisors: Pamela Glatt; Innocence Canada

ELLIE WAN

In the lab and beyond: my experience as a research assistant

ABSTRACT

Experience: A research assistantship was completed in the Forensic and Complex Trait Genetics Lab at the University of Toronto Mississauga. An individual research project utilized machine learning for predicting allele drop-in and drop-out rates and determining parameters, thresholds and instruments that impacted these errors. Attendance at the Northeastern Association of Forensic Scientists (NEAFS) Conference, offered an opportunity to present the research poster *Using Machine Learning Models to Predict Drop-in and Drop-out of Single Sourced STR Profiles Using the PROVEDit Dataset*. **Background**: This lab group was supervised by Frank Wendt. Members met weekly for progress updates and had the option to work remotely with flexible hours. The research and professional experiences gained through this placement contributed to aspirations of working in computational genetics. **Contents**: Research was interdisciplinary, combining forensic biology and computer science. Highlights of the placement included attending the NEAFS conference and learning to code in R and Python programming languages. Challenges during this placement included balancing the research workload with academics and learning to conduct literature reviews. **Results**: This opportunity contributed greatly to learning and career growth by honing skills needed to pursue a master's degree in epidemiology, and a potential publication of a research paper in a scholarly forensic science journal. **Conclusion**: With research, professional, and conference experiences gained through this placement, similar experiences are recommended to students interested in computational research.

Keywords: research assistant, conference, coding, forensic biology, publication, machine learning

Supervisors: Mary Anne Panoyan; University of Toronto Mississauga

KAYLEE WILLIAMS

Study hard, fight harder: interning at Lockyer Zaduk Zeeh criminal defence firm

ABSTRACT

Experience: A four-month internship was completed from May to August 2023, at Lockyer Zaduk Zeeh criminal defence firm. **Background**: To obtain this internship, over 30 criminal defence firms in Toronto were contacted via email to inquire about possible openings. Lockyer Zaduk Zeeh was selected, and as a result, this opportunity is now open to undergraduate students. Ms. Williams became the first undergraduate intern at the firm, paving the way for future students. This internship allows students to gain practical legal experience by preparing them for future legal endeavours. **Contents**: Core responsibilities included conducting legal research, drafting documents such as case books and appeal books, and appearing in court set dates. Through the internship, legal writing skills, improved public speaking, professional development was gained. Networking and exposure to diverse practices within criminal law was provided, as well as learning the ethical considerations associated with criminal law. **Results**: This opportunity has confirmed career ambitions through gaining practical experience in the field. **Conclusion**: The experience at Lockyer Zaduk Zeeh was enjoyable and recommended to aspiring law students, as this firm gives undergraduate students the ability to test out the duties of a lawyer, as well as educate them on legal proceedings.

Keywords: legal writing, public speaking, professionalism, law, networking

Supervisors: James Lockyer, Jefferey Couse, Madeleine Ross; Lockyer Zaduk Zeeh Defence Firm

POSTER SESSION
DEMONSTRATION BOOTHS

FSC407H5:

ADVANCED INDENTIFICATION FIELD SCHOOL

MARK CHAN, JIAYI CHEN, VALENTINA LEO, ALIYA PRIBYTKOVA

Gun bluing on spent cartridge cases

ABSTRACT

Purpose: This booth aims to demonstrate the use of chemical gun bluing in fingerprint enhancement on heated surfaces, such as spent cartridge cases. **Background**: Gun bluing was initially used by gunsmiths to protect firearms from rust and corrosion. Gunsmiths discovered that gun blue solution would not deposit where fingerprints were placed, allowing the solution to be used in developing ridge details on spent cartridges found at crime scenes. The basis for most common fingerprinting methods relies on the adhesion of the development medium to moisture retained in a latent fingerprint. This moisture evaporates after exposure to high heat when fired from a gun, rendering these methods useless. **Methodology**: The spent cartridge case is submerged for ~30 seconds in the gun bluing solution diluted in distilled water in a 1:1 ratio. The gun bluing solution only reacts with the part of the metal not covered by sebaceous oil left from the fingerprint, depositing a dark layer of selenium and copper. The areas of metal that react with the gun bluing solution darken, leaving the ridge detailing of the fingerprint lighter and easily visible by contrast. **Results**: Currently, there is no quantifiable data, but gun blue is widely used and yields better results, as measured on the Bandey Scale, compared to alternative methods on spent cartridges such as electrolysis or superglue fuming. **Conclusion**: Gun blue is an easy-to-use, cost-effective, and time-efficient technique that works better than other methods for spent cartridges.

Keywords: crime scene investigation, fingerprinting, forensic identification, gun bluing, latent fingerprint development, sebaceous matrix, spent cartridges

Instructors: Wade Knaap, Agata Gapinska-Serwin; University of Toronto Mississauga

MEGAN DAVENPORT, NAVROOP GREWAL, SOTA OKADA, YUSHAN YAN

Unlocking wet latent fingerprints with small particle reagent

ABSTRACT

Purpose: The purpose of this booth exhibit is to demonstrate the use of small particle reagent (SPR) for fingerprint development on a wet surface. **Background**: SPR is used to enhance latent (invisible) fingerprints on non-porous (smooth, solid) wet surfaces. Once applied, the mixture's particles bind to fingerprint residues and a chemical reaction occurs, making the impression visible for analysis. The technique was introduced in the late 1970s as an alternative to more common fingerprint development practices. It resulted from experimentation done by forensic scientists wanting to improve fingerprinting. **Methodology**: The particles from SPR adhere to the fatty components of fingerprint residues, leaving behind an outline of the print. The spray bottle with SPR is shaken to loosen the particles, then it is sprayed onto a wet surface with the prints. A batch of SPR (~300 mL) requires molybdenum disulfide (10 g), Photo-Flo (1 drop), and water (300 mL). **Results**: There have been multiple studies that have demonstrated the effectiveness of SPR. The studies have measured parameters such as the visible details, clarity of prints, and level of background interference. The use of SPR is widespread in forensic laboratories and law enforcement agencies worldwide. Evidence obtained using the method is admissible in court and experts have testified and presented findings using the technique in court. **Conclusion**: Overall, the method is straightforward, cost-effective, versatile, and its strong adhesive quality and non-destructive approach allows for quality impressions for forensic analysis.

Keywords: forensic identification, crime scene investigation, fingerprinting, small particle reagent

Instructors: Wade Knaap, Agata Gapinska-Serwin; University of Toronto Mississauga

VICTORIA FAZZARI, ALEXANDRA ADAMO, VERONICA VALITUTTI, JESSICA SIMCHISON

Novel crystal violet fingerprint slime technique

ABSTRACT

Purpose: This booth exhibit's purpose is to demonstrate a novel fingerprint development technique using crystal violet forensic slime. **Background**: In 2019, Leanne Byrne modified a forensic slime technique initially developed by Caleb Foster of the Metro Nashville Police Department. This method was deemed necessary to minimize chemical waste acquired during traditional spray or dip crystal violet fingerprint development methods. **Methodology**: 2.07g of borax powder and 0.15g of crystal violet are added into 75ml of hot water until fully dissolved. The solution is incrementally added to 67.5g of Elmer's Glue and kneaded, forming a homogeneous compound. To utilize the forensic slime on the adhesive side of tape, the compound was applied on the fingerprint using medium to heavy pressure for 30-40 seconds. The crystal violet stains the sebaceous sweat within a latent fingerprint a visible purple. **Results**: The technique is promising for future implementation, with most effective development on black electrical and beige packing tape, demonstrating consistency regardless of the time interval between deposition and development. The Bandey fingerprint grading scale had been used to evaluate fingerprint development quality. This technique is not widely used, with minimal replications performed. Limited research on this method diminishes its validity in court. **Conclusion**: Fingerprint development using crystal violet slime proposes an inexpensive and cost-effective method, minimizing chemical waste. This technique catalyzes an easy application process, limiting background interference.

Keywords: forensic identification, crime scene investigation, latent fingerprint development, crystal violet, novel technique

Instructors: Wade Knaap, Agata Gapinska-Serwin; University of Toronto Mississauga

POSTER SESSION

FSC489H5:

ADVANCED INDEPENDENT PROJECT

ALEXANDRA ADAMO

Understanding toxicological patterns and circumstances of fentanyl-related deaths in Ontario, Canada (2020-2022)

ABSTRACT

Purpose: This research examines toxicological findings in a series of death investigations where fentanyl was quantified, to identify the prevalence, trends, and demographic data in Ontario, Canada. This research aims to highlight changes in these trends since fentanyl began appearing in casework in Ontario in the early 2000's. **Background:** There has been a significant increase in fentanyl-related deaths in Ontario, Canada over the past 20 years, and it is critical this gap is investigated. **Methodology**: A retrospective study of all cases where fentanyl was quantified in deceased individuals' blood was conducted for the period between January 1, 2020, and December 31, 2022. **Results**: A total of 4395 cases were included, 77% of the decedents were male and 23% were female with ages ranging from 0 to 95. The most frequently classified cause of death was mixed drug toxicity (69%) followed by fentanyl intoxication at 19%. Less than 10% of cases where fentanyl was quantified were classified as non-drug related deaths. Fentanyl concentrations in all cases ranged from 1.3 to > 2000 ng/mL. Other drugs were frequently detected with fentanyl. Stimulants were the most frequently encountered class of drugs: cocaine and/or benzoylecgonine were identified in 55% and methamphetamine was observed in 37% of cases, respectively. **Conclusion**: This study provides valuable information for the scientific and medical community regarding the continued use of fentanyl and how patterns of fentanyl use have evolved since it began to appear in forensic casework.

Keywords: forensic science, toxicology, post-mortem, fentanyl, cause of death, manner of death

Supervisors: Karlie Marshall; Centre of Forensic Sciences. Karen Woodall; University of Toronto Mississauga

SIMRAN SANDHU

Internal validation of the Applied Biosystems SeqStudio Genetic Analyzer Platform for human identity applications

ABSTRACT

Purpose: This research aims to conduct an internal validation for the SeqStudio™ Genetic Analyzer for use in the Novroski Forensic Genetics Laboratory, providing insight on thresholds and limitations of the instrument to design experiments using optimized parameters for human identification applications. **Background**: Internal validation for novel instruments ensures fulfilled quality assurance and reliability requirements of a laboratory, prior to bringing instruments online. **Methodology**: Cell line samples from the National Institute of Science and Technology were utilized. Two samples were diluted to concentrations of 1ng, 500pg, 250pg, 125pg, 62.5pg, 31.2pg, and 15.6pg per µL and analyzed in triplicate for a sensitivity study. Different injection times, 10s, 7s, 5s, and 3s were also compared for one sample at 1ng/µL and 500pg/µL in duplicate. Two samples were used to create mixtures of 1:1, 1:3, 3:1, 1:9, and 9:1 ratios for mixture analysis. For a specificity study, dog, cat, rat, goat, and horse samples were collected. **Results**: Sensitivity series: allele dropout observed at 125pg/µL; locus dropout observed at 62.5pg/µL (sample one); both observed at 62.5pg/µL (sample two). Full profiles observed for all injection times except allele dropout at one locus in one duplicate for 500pg/µL. Mixture sample electropherograms were concordant with corresponding mixture ratios. For specificity, no profiles were observed for rat and goat DNA, and retesting is required for the other samples. **Conclusion**: The instrument is sufficiently sensitive and capable of appropriately analyzing mixtures for human identification purposes. Research is still ongoing, and will include re-testing for animal samples, assessment of 1s injection time, as well as mock casework analysis.

Keywords: forensic DNA analysis, capillary electrophoresis, SeqStudio, genetic analyzers, human identification, validation study

Supervisor: Nicole Novroski; Novroski Forensic Genetics Laboratory

CLOSING REMARKS: 3:50PM

DR. TRACY ROGERS

FSC481Y5 Course Instructor
Program Director,
Forensic Science Program
University of Toronto Mississauga

RECEPTION IMMEDIATELY FOLLOWING UNTIL 5:00PM

(Cash Bar)

CONGRATULATIONS!
FORENSIC SCIENCE SPECIALISTS
CLASS OF 2024

Aimen Zehra
Alexandra Adamo
Alexandra Hawse
Aliya Pribytkova
Ambar Sanchez De La Cruz
Ana Khan
Antonio Fragomeni
Anu Kasumu
Brendan Newton
Cassandra Bousfield
Chantel Houston
Cheryl Fung
Christina Sheppard-Greenhow
Connie Tu
Daniyah Ali
Divya Rohit
Elizabeth Bocsa
Ellie Wan
Emilie Ades
Emily Lawson
Faris Hassouna
Fatima-Zara Bagha
Gabriela Romo Cortes
Giuliana Larsen
Grace Lee
Hania Amir
Hannah Watson-Van Neste
Ienas Abdulaziz
Jacqueline Nagal
Jasmin Hemani
Jason Yap
Jeffrey Lok
Jennavieve Kyle
Jessica Simchison
Jiayi Chen

Jinze (Michael) Wang
Juanita David
Kieran Dumouchel
Kaylee Williams
Kelly Wong
Kennedy Martyn
Kyra van Biesen
Lathursha Kalaranjan
Lovelle Pong
Macy Smith
Maral Azizpour
Mark Chan
Maryam Dawood
Megan Davenport
Melissa Spyker
Navroop Grewal
Nina Le
Noah Andrew
Peter Patsakos
Rai-Anna Samuda
Rianna Ramana
Chloe-Runan Li
Sachnoor Sahni
Saliha Asim
Sarah Kay Eves
Shelby Soldwisch
Simona Mancini
Simran Sandhu
Sota Okada
Surina Vaid
Tina Lin
Valentina Leo
Veronica Valitutti
Victoria Fazzari
Vo Nhat (Katie) Bui
Ying Xian (Winnie) Lin
Yuening Chen
Yushan Yan

SPECIAL THANKS TO THIS YEAR'S MENTORS

AGATA GAPINSKA-SERWIN
Laboratory Technician
University of Toronto Mississauga

AMBER MANOCCHIO
Manager of Forensic Services
Ontario Forensic Pathology Services

BRENDA CAPOLUPO
Removal Technician
Ontario Transfer Services Inc.

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Assistant Crown Attorney
Ministry of the Attorney General

CARRIE BELLAN
Trial Lawyer
Bellan Law

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PhD Candidate
University of Toronto

CRAIG FRASER
Ontario Review Board

CORY GERRITSEN
Psychologist
Centre for Addiction Mental Health

DUNCAN WAY
Forensic Artist
Ontario Provincial Police

EUGENE LISCIO
ai2-3d Forensics

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University of Toronto Scarborough

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University of Toronto Mississauga

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Office of the Fire Marshal

JESSAMYN SCHERTZ
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University of Toronto Mississauga

JOSE SANCHEZ
Sessional Instructor
University of Toronto Mississauga

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Associate Professor
University of Toronto Mississauga

KARLIE MARSHALL
Forensic Analytical Toxicologist
Centre of Forensic Sciences

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University of Toronto Mississauga

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Ministry of the Attorney General

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Forensic Identification Officer
Peel Regional Police

MARTIN GREALISH
Senior Pathologist Assistant
University Health Network

MARY ANNE PANOYAN
PhD Candidate
University of Toronto

MERIAH WOODHOUSE
Forensic Identification Officer
Peel Regional Police

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Assistant Crown Attorney
Ontario Review Board

MICHAEL HO
Forensic Identification Officer
Peel Regional Police

NICHOLAS HARRIS
Peel Regional Police, FIS

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PAMELA ROSE GLATT
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Ontario Review Board

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Ontario Forensic Pathology Service

ROBERT HOFSTETTER
Bloodstain Pattern Analyst
Peel Regional Police

ROLANDA LAM
Forensic Identification Services
Royal Canadian Mounted Police

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STEPHANIE MUNTEN
Waypoint Centre for Mental Health Care

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University of Toronto Mississauga

TREVOR ORCHARD
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University of Toronto Mississauga

VINCY CHAN
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KITE Research Institute

WADE KNAAP
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University of Toronto Mississauga

ZOE HILTON
Senior Research Analyst
Waypoint Centre for Mental Health Care

FSC483H5 INSTRUCTORS

EUGENE LISCIO
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KAREN WOODALL
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CAITLIN PAKOSH
Assistant Professor, University of Toronto Mississauga

FSC407H5 INSTRUCTORS

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Forensic Laboratory Technician, University of Toronto Mississauga

GRACE GREGORY-ALCOCK
Teaching Assistant, PhD Student
University of Toronto

FORENSIC SCIENCE PROGRAM STAFF & FACULTY

STAFF

TERESA CABRAL (on leave)
Forensic Science Program Administrator, Academic Advisor

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Forensic Science Program Officer
Outreach Coordinator

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Forensic Chemistry Laboratory Technician

DAVID GERSTLE
Forensic Science Librarian

JOANNE KAO
Forensic Science Business Officer

CAROLYN LOOS
Forensic Science Program Manager

JAMIE MCGREGOR
Forensic Biology Laboratory Technician

EMILY NANJAD-GRIFFITH
Forensic Science Program Academic Advisor

FACULTY

MARC DRYER
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WADE KNAAP
Assistant Professor,
Detective Constable (Retired)
Toronto Police Services

EUGENE LISCIO
Adjunct Professor, Digital Reconstruction

VIVIENNE LUK
Associate Professor, Teaching Stream, Forensic Chemistry

NICOLE NOVROSKI
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CAITLIN PAKOSH
Assistant Professor, Forensic Science and the Law in Canada

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TRACY ROGERS
Associate Professor, Forensic Anthropology

RASMUS ROSENBERG LARSEN
Assistant Professor, Forensic Epistemology & Psychology

SHELBY SCOTT
Assistant Professor, Statistics, Forensic Anthropology

DAX URBSZAT
Senior Lecturer, Department of Psychology

LELIA WATAMANIUK
Assistant Professor, Forensic Anatomy, Forensic Pathology

KAREN WOODALL
Associate Professor, Teaching Stream, Forensic Toxicology

SESSIONAL LECTURERS

MURRAY CLAYTON
Ethics and Professionalism in Forensic Science

ZACHARY CURRIE
Forensic Analytical Toxicology

CRAIG FRASER
Mental Health and the Criminal Justice System

AGATA GAPINSKA-SERWIN
Physical Evidence and Microscopy

SONYA MCLAREN
Forensic Psychopathology

BRETT MOODIE
Mental Illness and the Criminal Justice System

ASHLEY MOO-CHOY
Seminar in Forensic Science

JOSE SANCHEZ
Topics in Forensic Science

STUART SAGARA
Forensic Chemistry

ASHLEY SMITH
Physical Evidence and Microscopy

FORENSIC SCIENCE CAPSTONE CONTACTS

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NOTES