

GradEX2013

Staffordshire University 16 May, Stoke-on-Trent

Welcome to GradEX 2013!

It is my great pleasure to welcome visitors old and new to GradEX, our annual exhibition of project work undertaken by final year students at Staffordshire University. This year sees students from the new Faculty of Computing, Engineering and Sciences being joined by fellow students from the Faculty of Arts and Creative Technologies for the first time. Not only does this mean that Science students are new to GradEX, but also that the event has now become cross-Faculty. The purpose of the exhibition is to allow our students to showcase their work to prospective employers, the public, friends, family, and colleagues, and it has become a well-established event in the University's calendar.

GradEX offers our students a chance to explain their work to others and as such it plays an important and formative role in their development. Key to GradEX's success is the involvement of employers and every year the personal interactions that take place between our students and key industry figures result in genuine job offers and career opportunities.

GradEX 2013 is sponsored by a range of employers and professional organisations. I am very grateful for their support as not only does it serve as a mark of recognition for the work of our students, but it also adds significant value and esteem to the event.



Thank you for taking the time to visit. I am very proud of our students and GradEX provides an excellent opportunity to celebrate their achievements. I hope that you can share in this celebration and that you enjoy your day with us at Staffordshire University.

Best wishes,
Professor Hastings McKenzie EngD, CEng, MIMechE
Dean of Computing, Engineering and Sciences

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* The average increase in pre-tax profit that companies taking part in a KTP realise. Technology Strategy Board 2011.

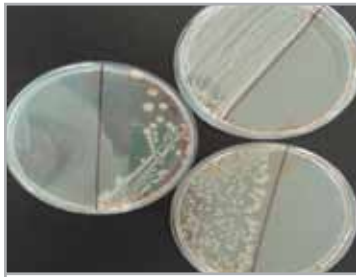
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Bethany Foster

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Alcohol Hand Sanitizers: Brand vs. Budget, False Economy?

The incorporation of alcohol hand sanitizers into the NHS hand hygiene policy has resulted in it being a common feature of the modern hospital. This investigation directly compares the efficiency of a budget and brand hand sanitizer on skin microbiota, along with considering possible financial implications on the NHS.



Rachel Galler

BSc(Hons) Human Biology

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Is Cod Liver Oil Beneficial in Reducing Blood Lipid Levels?

This study involves biochemical tests to measure serum lipids in order to gain an insight into the mechanisms underpinning the beneficial role cod liver oil has on reducing the level of cholesterol and triglycerides in the blood and the protective functions it has against the adverse effects of cardiovascular disease.



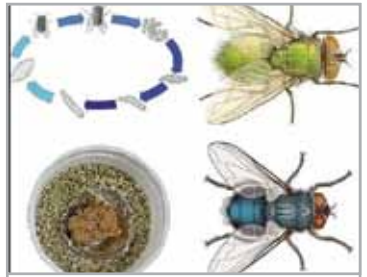
Adam Glenville

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Morphological Variation between Dog Whelk Populations

Studying the variation in the shape of different dog whelk (*Nucella lapillus*) populations depending on the wave exposure of the beach on which they are found.



Samantha Guest

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Effect of Photoperiod on Larval Growth and Development Rate

Flies have important medical and forensic applications therefore the techniques used to rear their larvae is relevant when studying their development. This project will look at whether different photoperiod regimes will affect the growth rate and development of the immature stages of two important species of flies.



Richard Halfpenny

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Invertebrate Biodiversity Reductions in Japanese Knotweed

Developing a better understanding of the impact of an invasive plant species. Does encroachment of the non-native invasive plant Japanese knotweed (*Fallopia japonica* Houtt.) reduce invertebrate biodiversity and abundance differentially between the leaf litter zone compared to the canopy of the vegetation?



Chad Holmes

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A Comparison of Street Trees in S-o-T and N-u-L

Street trees are a common sight in the UK and offer many benefits to urban environments including lower air temperatures in the summer, associated with less heat strokes. This project aims to compare the density and species richness of Stoke-on-Trent and Newcastle under Lyme and highlight any associated benefits.



Laura Alice Jane McClelland

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Insular Malay Civet: the Effects of Island Syndrome

This project focuses on the Malay Civet (*Viverra zibetha*) population living on Buton Island, Indonesia, and determines whether this population displays sexual dimorphism and if so, if it is affected by Island Syndrome.



Irma Mir

BSc(Hons) Human Biology

ReaCTive Protection!

Smoking causes increased risk of cancer and cardiovascular disease via free radical damage (FRD). This project aims to see if vitamin C in a drink could protect smokers from FRD immediately. If so then small dietary changes can reduce the problems associated with smoking, in the short term.



Jeffrey Momoh

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Slurreration - Slurry Enhancement into Fertiliser or Biodiesel

This project aims to provide farmers with an approach to utilise their otherwise unwanted slurry. Cattle farmers can utilize it as enhanced fertilizer (replacing inorganic fertiliser) and pig farmers will benefit from the production of Biodiesel. Odour and pathogens are eliminated, spreadability improved.



Abrar Awan

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Plant Communication

This project aims to assess the phenomena of plant communication through carefully constructed experimental design. Plant to plant communication is an emerging field with novel insights into the intricacies of plant evolutionary biology.



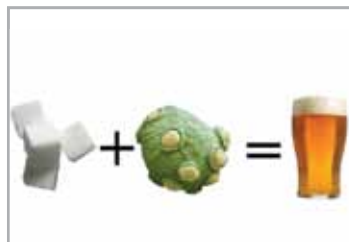
Emily Briers

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Does Music Reduce Anxiety During Finger Prick Testing?

Needle phobias are very common in healthcare settings, their use can be life saving, yet refused by some phobic patients. Music can be used to create a relaxed environment. Using this idea, can music be used to relax people that are going to have a finger prick test?



Neil Dibnah

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RNA Expression in *S.cerevisiae* in Response to Changes in pH

S.cerevisiae is commonly used in the production of alcohols. The ADH1 gene plays an integral role in the production of both ethanol and fusel alcohols. By culturing the yeast in conditions relative to the production of these alcohols it is anticipated that optimal conditions can be found to for their production.



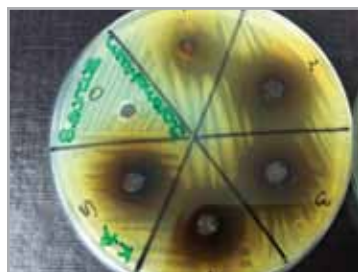
Promise Ndlovu

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Comparative Study of the Relative Abundance of *Streptomyces*

This project aims at quantifying the relative abundance of *Streptomyces* (sp) in sand, peat and clay soil. Having ascertained the relative abundances of *Streptomyces* (sp) in the different soil types, it becomes possible to ascertain whether the observed microbial growths are indeed *Streptomyces* (sp).



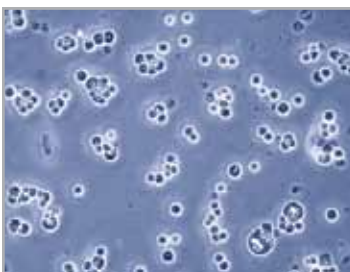
Kiran Rai

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Traditional Herbal Medicine - An Alternative to Antibiotics

Bacterial resistance to antibiotics has resulted in an exponential growth in the utilisation of herbal medicine. This project explores the antibacterial properties of three medicinal plants, *Curcuma longa*, *Azadirachta indica* and *Syzygium aromaticum*, which have been used to prevent and treat several infections in India.



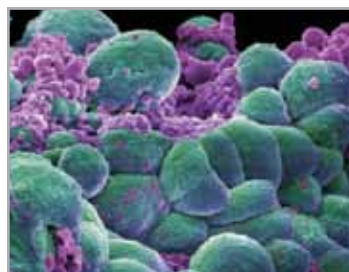
Siobhan Roche

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Does Stress Affect the Motility of Fibrosarcoma Cells?

Corticotropin Releasing Hormone is stress related peptide which is known to affect the immune system negatively. A weak immune system can be an advantage to tumour progression. This project looks at the motility of L929 when stimulated with Corticotropin Releasing Hormone, a stress related peptide.



Daniel Thacker

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Progesterone Wars: Episode 1 a New Hope

The involvement of progesterone in breast cancer is uncertain. Breast cancer cells have been shown to express either a high or low number of progesterone receptors. My project found that progesterone stimulates cell division of a breast cancer cell line. Progesterone would be deleterious to breast cancer patients.



Zuzana Tothova

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Diet and Drugs, a Conflict for Health?

Many drugs are activated or processed for removal by liver enzymes. The same enzymes process dietary components for excretion so there is competition between the two resulting in detrimental therapeutic effects. This project compared the effects of dietary components on enzyme activity involved in normal drug processing.



Haleigh Waring

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An Investigation that Compares both Shop and Farm Bought Egg

We take for granted that our foods produce have been effectively prepared before they are sold to the public, but how effectively prepared are they? This investigation takes a closer look at just how many pathogens still reside on eggs even after they have gone through a cleaning process.



Andrew Westgarth

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Toxicity of Alcohol and Paracetamol

The water flea *Daphnia* was used as a model organisms to investigate if alcohol enhances the toxicity of paracetamol. The toxicity of vodka, 40% ethanol or paracetamol was compared with combined vodka and paracetamol and combined 40% ethanol and paracetamol.



Wioletta Kuzia

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Fermented Milk Drinks versus Common Human Pathogens

Fermented drinks are components of the common human diet and are claimed to have health benefits by action of antimicrobial substances naturally produced by lactic acid bacteria *Lactobacillus*. This study assessed this potential antimicrobial action on a range of common pathogens found in human intestinal flora.



Mark Ashby

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An "i-TREE" Assessment of a Green Space in Stoke-on-Trent

The U.S. Forest Service software tool "i-TREE" Eco is being used to assess the ecosystem services provided by the trees within Cauldon Park (Stoke-On-Trent). The tool has also been assessed to see how applicable it is for use as an undergraduate teaching aid at Staffordshire University for future students.



Liam Booth

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British Upland Rivers: A Complex Interconnected System

The geomorphology of the British Upland Rivers is affected by the many different forms and processes that operate within the channel and the surrounding catchment. These controls are all interconnected and interact with each other to alter the morphology of an upland river channel.



Suzanne Detton

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Land Use Impacts on Sand Dune Vegetation at Morfa Harlech

Humans use sand dunes for recreation and leisure, but in doing so, are they impacting the vegetation species diversity at Morfa Harlech?



Czanya Fedulow

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Does a Seahorse Smile?

A comparative study of behavioural tendencies between four captive Hippocampus species, H. barbouri, H. kuda, H. adominalis and H. erectus, with a primary focus on social interaction and behavioural variants between species.



Katie Lester

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Investigating Volcanic Risk Awareness in the Midlands

The level of risk perception people have has recently been recognised as a key factor to their hazard responses according to Milette (1999). This project investigates volcanic risk awareness in Burton upon Trent, Stoke on Trent and Derby. It focuses on concerns, knowledge, and differences in gender, age and profession.



Kane Lister

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Sustainable Transport Drivers, Barriers and Solutions in SME

An investigation to the drivers, barriers and potential solutions for SME Businesses in the UK with regards to sustainable Transport. Conducted through interviews and participant observations to find attitudes and behaviours towards sustainable transport technologies and practices and how these methods can benefit SME's.



Sarah Richardson

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Elephant Impact on Vegetation in South Africa

My project aimed to assess the extent of elephant impact in Pongola Game Reserve and Pongola Poort Nature and to find out the change that the elephants are having on the vegetation. I have looked at the vegetation habitats, location of elephants and the impact of the elephant on the reserve.



Philip Jon Russell

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Water Levels on the River Sow (Staffs): Effects on Angling

An investigation into changing water levels of the River Sow (Staffs), the growth in popularity of private stillwater fisheries and the effect these changes may have had locally on the pursuit of angling. Further investigations into how angling is now promoted through TV and angling journals.



Clare Angrave

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Skin Wrinkling and the Effect on the Quality Fingermarks

This project looks into how the wrinkling of skin due to submersion in water may affect the quality of a fingermark produced on a porous and non-porous surface after using a variety of development techniques. A range of areas such as time and temperature will also be analysed for any affect and compared with controls.



Giorgio Blom

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Detection of Clandestine Human Burials

Putrescine and cadaverine are considered to be key to the detection of human remains by cadaver dogs. They can act as biomarkers to detect clandestine graves. It is surprising that most researchers in this field did not detect these compounds. This study showed that these compounds were detected in a grave environment.



Emma Bowden

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Research Project into PCSO

This project is looking into four types of crime to analyse the effectiveness of the role of the Police Community Support Officers (PCSO) in six force areas. The aim of the project is to assess if the role of the PCSO has had an impact on crime from 2002 to 2012 through quantitative and qualitative research methods.



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Is Forensic Analysis Hindered after Clean Up Attempts?

Clean up attempts are often used by criminals to avoid leaving clues at the scene of a crime. This is a problem faced routinely by forensic scientists. This study outlines how the use of commercial cleaning products effects the presumptive testing and subsequent DNA analysis of cleaned body fluid stains on carpet.



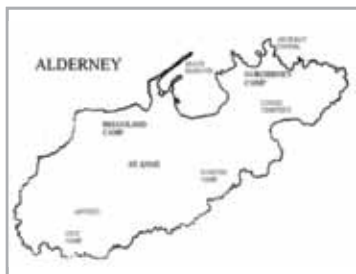
Natalie Cruise

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The Effect Substrates have on Casting 3D Impressions

The author suggests that substrates affect the quality of the casting materials ability to produce class and individual characteristics that were evident on the sole of the training shoe. Three substrates used were soil, clay soil and sand. The casting materials were plaster of Paris, Dental stone and Nucastr 180.



Sujata Devi

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An Archaeological Survey of the Slave Camps on Alderney

This project aims to conduct an archaeological survey of the Island of Alderney, particularly the 4 main slave labour camps and the additional unknown camps. This will be implemented by using non-intrusive forensic archaeology techniques to confirm the locations of these camps and what remains of them today.



Joanne Dinning

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The Forensic Analysis of Equine Hair Morphology

Within purebred equine breeds, the pelage of fifty purebred horses was sampled from twenty individual pure breeds. Using light microscopy, specific morphological characteristics from seven hairs of each sample were examined to establish whether a certain breed could be identified solely by individual traits.



Victoria Fones

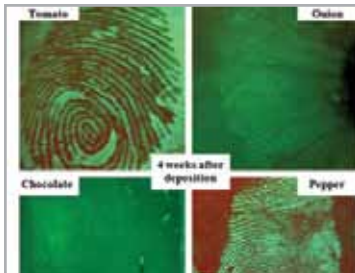
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Can Graves be Identified by Desk Based Research?

This project will investigate if desk based research can identify mass graves. An unmarked mass grave within Belarus will be investigated and compared to a known mass grave within Poland.

Policing, Criminal Investigation and Forensic Science



Kerry Ford

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Fingerprint Recovery from Perishable Items under Different Storage Conditions

Chocolate, tomatoes, peppers and onions were stored in water, salt water and a fridge for up to 8 weeks. Cyanoacrylate Fuming was utilised to recover fingerprints at 6 different time intervals to consider whether storage and time, and subsequently decomposition of the item, had an effect on the quality of the resultant prints.



Nicola Henderson

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The Effect of Washing Conditions on Semen Retrieval

Rape often has no witnesses making evidence crucial. Garments of victims can hold body fluids which may be washed before analysis. For my project I washed semen stains in different conditions then conducted four different tests to identify semen.



Kelly Hoblyn

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Hand Span and Impact Spatter Through Blunt Force Trauma

What's to hand?! Gun laws have become stricter in UK, homicides involving blunt instruments commonly found in the house have increased in relation to homicides involving guns. This research project examines the use of hand span as a potential factor in identifying a suspect through the calculation of impact spatter.



Karen Hulse

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The Effects of Material Type on Blowfly Development

This research involved wrapping pieces of liver in a variety of different materials in order to measure the rate of development of blowfly larvae. It was expected that the thickness and porosity of the material would have an effect on the rate of larvae growth.



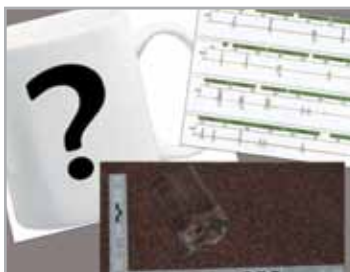
Paul Jira

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Detection of Lipids in Soil from Simulated Shallow Graves

Detection of lipids in soil produced by decomposing animal tissue.



Katherine Keeling

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DNA Recovery from Drink Containers: Exploring the Variables

Any item at a crime scene has the potential to be or yield evidence. This project observes a less obvious evidence source yielding biological material. A known fact is that drink containers can yield saliva BUT do the substrate material and the beverage being consumed impact the quality and quantity of DNA recovery?



Janos Kerti

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WW2 Archaeological Investigation

Applying non-invasive techniques, in order to accurately map and record Lager Sylt concentration camp. With the use of archaeology methods, a map of the camp layout and features it contains can be recorded. The only map which exists today was produced from memory 30 years after World War Two.



Victoria Le-Seelleur

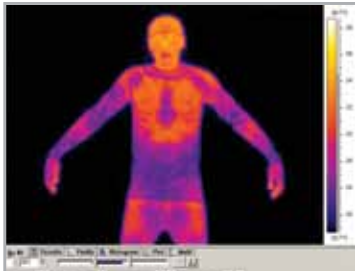
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Distance Determination through Shot Distribution and Damage

Using 3 shotguns, each with a different barrel length and either a full or no choke, each were fired at two distances. Abrasions on the shot and spread of the shot were then analysed to see if there was a relation between that and the distance.

Policing, Criminal Investigation and Forensic Science



Stephanie Lester

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Forensic Undersuit: For Cooling and Comfort.

The Forensic undersuit has been designed to be worn underneath the forensic suits at crime scenes, instead of the individual's every-day clothing. It is made from wicking fabric which works by drawing sweat away from the body, therefore keeping the person cooler. This also increases the comfort of wearing forensic suits.



Sofina Malik

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Confirming or Refuting the Findings of MI19

This study was the first to look into sufficient detail the accuracy of the 1944 MI19 map by carrying out an archaeological walkover survey to outline, extract and record information pertaining to the physical landscape surrounding sites of the German Occupation of archaeological interest on the Island of Alderney.



Crystal Moore

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Are Tattoos useful in Identification during Decomposition

The increased population of self-expressive individuals within modern society have enabled many questions to be raised about the forensic value of tattoos. Can tattoos offer evidence for the identification of individual's post-mortem even if there is significant degradation of identifying features?



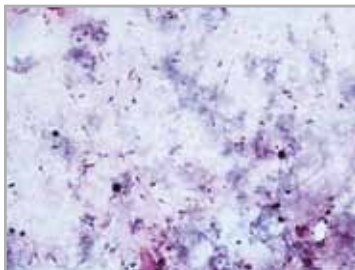
Emma Morgan

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Jeremy Bamber: Murder or Miscarriage of Justice?

Students in Policing and Criminal Justice were each given a case study. I was given the case of Jeremy Bamber, who was arrested and convicted of the murder of five of his family members in 1985. Was this a heinous act carried out by this man or a terrible case of miscarriage of justice?



Linsy Nicholls

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Effect of Spermicide on Detection of Spermatozoa

The number of offenders using condoms in cases of rape has increased meaning loss and degradation of biological evidence. This is an investigation into the rate at which Nonoxynol-9 spermicide degrades the sperm cell in different environmental conditions. Results may assist in determination of time since incident.



Lauren Peck

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GPS in the Search for Clandestine Burials

The world of technology is quickly evolving around us at an alarming rate - but how can we harness it in ways it was not necessarily invented for? This research project studies the use of GPS; a technology that was once used for satellite navigation purposes, in the search for hidden and unlawful burials.



Kayleigh Sheppard

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Adipocere Formation and the Wrapping of Bodies

An investigation into the effects of different types of wrapping materials on the rate and extent of adipocere formation on a porcine model. Analysis using Gas-Chromatography coupled with Mass-Spectrometry was employed to determine the chemical composition of adipocere which formed over a 14 week decomposition period.

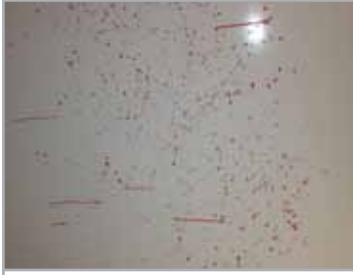


Heather Spender

BSc(Hons) Forensic Science

Taking a Bite Out of Shark DNA

The brutal, cruel and wasteful act of shark finning has deep impacts economically, ecologically and ethically around the world and with the illegal activity in this area increasing all the time, modern forensic techniques need to be researched and applied more thoroughly to stop this unnecessary brutality.



Jessica Stevens - Jones

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How Insect Activity Affects Bloodstain Pattern Analysis

Behavioural traits of *Calliphora vicina* (common blow fly), with animal blood, comparing how their presence can affect different blood spatter pattern interpretation at serious crime scenes, allowing for prediction of likely common locations of fly artefacts in relation to location/distribution of the original patterns.



Francesca Stubbs

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Blood Pattern Analysis on a Suspects Clothing

This project aimed to show if there is a difference in spatter distribution on clothing when trying to determine if a weapon was used when hitting a victim. The project attempted to show if there was a significant difference in the distribution of spatter on a suspects' clothing when looking at punching action vs weapon.



Sarah Thompson

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The Investigation of Belzec Death Camp.

This is an investigation into areas of potential mass graves at Belzec death camp in Poland. This was used by Hitler's SS Army during the Second World War for the eradication of Jews. The investigation is searching using aerial images and maps to identify potential mass grave sites.