

13TH ANNUAL IKBSAS UNDERGRADUATE RESEARCH CONFERENCE

April 25th, 2018

EME 1101

Student Name	Presentation Title	Time	Chair
Nathan LUCKY	"It matters very much whether you care that they live or die": British Columbia Newspaper Responses to Jewish Persecution in Europe, 1933-1939	10 - 10:20	James Hull
Nicole TOMASIC	Sugar Babies Among Female Canadian University Students: Sweet or Unsavoury?	10:20 - 10:40	James Hull
Jaclyn SALTER	Live and Die by the Revolution: A History of Populism in the Republican Party and the Front National	10:40 - 11	James Hull
Jack WILSON	Cooperation with the Appearance of Competition: The Canadian Pacific and Canadian National Railways in the Okanagan, 1920-1935	11 - 11:20	James Hull
Shaniya ANAND	Speaking Worldviews: The Implications of Expressing Trauma and Anxiety Through Conlang	11:20 - 11:40	Hugo De Burgos
Laura FYLYSHTAN	On the Topic of Social Housing and how it pertains to Philosophy, Politics, and Economics	11:40 - 12	Hugo De Burgos
Joshua TAFEL	Moving toward Harm Reduction: An analysis of the Canadian government's new policy regarding supervised consumption sites	12:40 - 1	Hugo De Burgos
Mac CAMPBELL	Analyzing discrepancies in wildlife habitat modelling methods between Alberta oil sands environmental assessments	1 - 1:20	Corrina Thomsen
Sarah FALCONER	Can 'big game' species be used as indicators to help direct conservation funding in British Columbia?	1:20 - 1:40	Corrina Thomsen
Brianne NEWMAN	Comparison of Yeast Populations in an Okanagan Winery and Vineyards	1:40 - 2	Kevin Smith
Haley SILAS	Therapeutic for all? Observational assessments of therapy canine stress in an on-campus stress-reduction program	2:20 - 2:40	Kevin Smith
Genevieve MYLOCOPOS	Impact of acute oral ketone monoester supplementation on monocyte NLRP3 inflammasome activation in humans with prediabetes	2:40 - 3	Kevin Smith
Joseph GASPARI	Study of glutamate receptors (iGluR6) via imaging and electrophysiology	3 - 3:20	Wyatt Slattery
Alexander CONWAY	Sulfonium Chemistry: A Nature-Inspired Approach to Label Proteins	3:20 - 3:40	Wyatt Slattery

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EME 1121

Student Name	Presentation Title	Time	Chair
Stephen COLLINS	Optimizing Iterative Image Reconstruction Methods in Optical CT Radiation Dosimetry	10 - 10:20	Varun Surendran
Sabrina MADSEN	Measuring the Permeability of Arrays of Split-Ring Resonators using a Loop-Gap Resonator	10:20 - 10:40	Varun Surendran
Dakota MCKEOWN	Quantifying the Performance of Next Generation X-ray Detectors	10:40 - 11	Varun Surendran
Robert LALONDE	Modelling x-ray system performance in mammography	11 - 11:20	Jake Bobowski
Sean COLFORD	Efficiency of Shear Driven Flow in Power-Law Fluids	11:20 - 11:40	Jake Bobowski
Stephanie GALATA	Thin Matter Shell Collapse in a Vaidya-Vaidya Exterior Black Hole	11:40 - 12	Jake Bobowski
Aravis WALTERS	Lay Perceptions of Non-Offending Pedophilia	12:40 - 1	Lesley Lutes
Larissa JUST	Sexual Victimization in Men and Women	1 - 1:20	Lesley Lutes
Alissa YARGEAU	Paraphilia's and the Dark Triad: An Examination of Dark Personalities Sexual Interests and Behaviours	1:20 - 1:40	Crystal Mundy
Audra DAVIS	Reframing Happiness: Can you Picture it?	1:40 - 2	Crystal Mundy
Jessica HANSEN	Computerized Street Crossing Exercise for Neglect Patients	2:20 - 2:40	Crystal Mundy
May LY	Validation of the Translated Negative Physical Self Scale	2:40 - 3	Stefanie Ciszewski
Leah SORGE	Finding the Fakers: Use of Eye Tracking during the Wisconsin Card Sorting Test as an Intrinsic Test of Effort	3 - 3:20	Stefanie Ciszewski
Chelsea TINGLEY-WEISGERBER	Investigating the Dream Content of Dark Personalities	3:20 - 3:40	Stefanie Ciszewski

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Student Name	Presentation Title	Time	Chair
Megan BUERS	How biosolids impact American Kestrel (<i>Falco sparverius</i>) nest site selection and diet	10 - 10:20	Isaac Li
Arianna ORMROD	Diet composition of raptors and corvids on a mixed woodland/grassland ecosystem	10:20 - 10:40	Isaac Li
Corrinna KARPENKO	Identification of genetic and biochemical differences among <i>Botrytis cinerea</i> and <i>Alternaria</i> spp. isolates, postharvest pathogens of sweet cherries in the Okanagan	10:40 - 11	Yousif Murad
Emily O'BRIEN	Effects of Nitric oxide Producing Bacteria <i>Azospirillum brasilense</i> on <i>Cannabis sativa</i> Microbial Composition, Cannabinoid and Terpene Content	11 - 11:20	Yousif Murad
Thea MILES	Asymbiotic trait variance in <i>Rhizoglyphus irregularis</i> : Is in vitro propagation decreasing intra-isolate variation and producing more ruderal isolates?	11:20 - 11:40	Fred Menard
Michelle MACDONALD	Exploring sustainable tools in agriculture: effects of cover crop treatments on entomopathogenic fungi	11:40 - 12	Fred Menard
Becky LOVEROCK	Investigating the spread of a commercial biofertilizer through non-target vegetation.	12:40 - 1	Alicia Mercer
Victoria SANDERSON	Life Cycle Assessment (LCA) of the Okanagan Cherry Industry	1 - 1:20	Alicia Mercer
Michael TARNOWYCZ	Functional Gene Analysis (L001) of PDR class ABC transporter from Lavenders: a yeast model for inhibition assays to detect monoterpene trafficking	1:20 - 1:40	Karen Perry
Riley PETILLION	Enriched Pedagogy of Flipped-Class Video Design – Student Attitudes and Learning Gains in First-Year Chemistry	1:40 - 2	Karen Perry
Jillian FORSYTH	Impact of Changing to More Sustainable Lighting Systems on the Growth of Plants	2:20 - 2:40	Karen Perry
Erik WANDINGER	Psychometric Evaluation of the Attitudes Toward Sexually Predatory Behavior - Revised (ATSPB-R) Questionnaire	2:40 - 3	Crystal Mundy
Allyson DYCK	The Interactions of <i>Drosophila</i> E3 Ubiquitin Ligases in the Sensitized Eiger Overexpression Background	3 – 3:20	TBD

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EME 1153

Student Name	Presentation Title	Time	Chair
Riley WATERS	3D Reconstruction of Rolling Cells using Computer Vision Techniques	10 - 10:20	Yves Lucet
Norbert EKE	Predators become the prey: using statistical machine learning and computational linguistics to detect sexual predators	10:20 - 10:40	Yves Lucet
Jeff BULMER	Visualizing Code Patterns in Novice Programmers	10:40 - 11	Yves Lucet
Dana KLAMUT	Improved Database Performance for Internet of Things Devices	11 - 11:20	Yves Lucet
Kyla REID	Advanced and Solid Querying on Embedded Devices	11:20 - 11:40	Warren Hare
Robert HILL	Toolbox for Convex Piecewise-defined functions	11:40 - 12	Warren Hare
Zifang JIANG	Dynamic visualization of piecewise-linear quadratic functions	12:40 - 1	Warren Hare
Megan KURZ	Global Optimization for Road Design Optimization	1 - 1:20	Warren Hare
KT NGUYEN	A multi-response model for microfluidic-based gas detectors	1:20 - 1:40	Paramjit Gill
Levi MILLER	Applying a Novel Polynomial basis to a Reed-Solomon Decoder.	1:40 - 2	Paramjit Gill
Phillip SHREEVES	Addressing Overfitting in Mixtures of Factor Analyzers	2:20 - 2:40	Paramjit Gill
Wan Pei Michelle POH	Do You Express Your Emotions? A Cross-Cultural Study	2:40 - 3	Kaylee Misener
Michelle SCHROTH	Habits and Happiness: How to Create Lasting Change.	3 - 3:20	Kaylee Misener
Paul LUTZ	From Moral Identity to Flourishing: A Pathway of Self-Transcendence and Meaning in Life	3:20 - 3:40	Kaylee Misener

13th Annual Undergraduate Research Conference

Oral Presentations

	Title	Page
EME 1101		
Nathan LUCKY	"It matters very much whether you care that they live or die": British Columbia Newspaper Responses to Jewish Persecution in Europe, 1933-1939	1
Nicole TOMASIC	Sugar Babies Among Female Canadian University Students: Sweet or Unsavoury?	1
Jaclyn SALTER	Live and Die by the Revolution: A History of Populism in the Republican Party and the Front National	2
Jack WILSON	Cooperation with the Appearance of Competition: The Canadian Pacific and Canadian National Railways in the Okanagan, 1920-1935	2
Shaniya ANAND	Speaking Worldviews: The Implications of Expressing Trauma and Anxiety Through Conlang	3
Laura FYLYSHTAN	On the Topic of Social Housing and how it pertains to Philosophy, Politics, and Economics	3
Joshua TAFEL	Moving toward Harm Reduction: An analysis of the Canadian government's new policy regarding supervised consumption sites	4
Mac CAMPBELL	Analyzing discrepancies in wildlife habitat modelling methods between Alberta oil sands environmental assessments	4
Sarah FALCONER	Can 'big game' species be used as indicators to help direct conservation funding in British Columbia?	5
Brianne NEWMAN	Comparison of Yeast Populations in an Okanagan Winery and Vineyards	5
Haley SILAS	Therapeutic for all? Observational assessments of therapy canine stress in an on-campus stress-reduction program	6
Genevieve MYLOCOPOS	Impact of acute oral ketone monoester supplementation on monocyte NLRP3 inflammasome activation in humans with prediabetes	6
Joseph GASPARI	Study of glutamate receptors (iGluR6) via imaging and electrophysiology	7
Alexander CONWAY	Sulfonium Chemistry: A Nature-Inspired Approach to Label Proteins	7
EME 1151		
Megan BUERS	How biosolids impact American Kestrel (<i>Falco sparverius</i>) nest site selection and diet	7
Arianna ORMROD	Diet composition of raptors and corvids on a mixed woodland/grassland ecosystem	8

Corrinna KARPENKO	Identification of genetic and biochemical differences among <i>Botrytis cinerea</i> and <i>Alternaria</i> spp. isolates, postharvest pathogens of sweet cherries in the Okanagan	8
Emily O'BRIEN	Effects of Nitric oxide Producing Bacteria <i>Azospirillum brasilense</i> on <i>Cannabis sativa</i> Microbial Composition, Cannabinoid and Terpene Content	9
Thea MILES	Asymbiotic trait variance in <i>Rhizoglosum irregulare</i> : Is in vitro propagation decreasing intra-isolate variation and producing more ruderal isolates?	9
Michelle MACDONALD	Exploring sustainable tools in agriculture: effects of cover crop treatments on entomopathogenic fungi	10
Becky LOVEROCK	Investigating the spread of a commercial biofertilizer through non-target vegetation.	10
Victoria SANDERSON	Life Cycle Assessment (LCA) of the Okanagan Cherry Industry	11
Michael TARNOWYCZ	Functional Gene Analysis (L001) of PDR class ABC transporter from Lavenders: a yeast model for inhibition assays to detect monoterpene trafficking	11
Riley PETILLION	Enriched Pedagogy of Flipped-Class Video Design – Student Attitudes and Learning Gains in First-Year Chemistry	12
Jillian FORSYTH	Impact of Changing to More Sustainable Lighting Systems on the Growth of Plants	12
Erik WANDINGER	Psychometric Evaluation of the Attitudes Toward Sexually Predatory Behavior - Revised (ATSPB-R) Questionnaire	13
Allyson DYCK	The Interactions of <i>Drosophila</i> E3 Ubiquitin Ligases in the Sensitized Eiger Overexpression Background	13
EME 1153		
Riley WATERS	3D Reconstruction of Rolling Cells using Computer Vision Techniques	14
Norbert EKE	Predators become the prey: using statistical machine learning and computational linguistics to detect sexual predators	14
Jeff BULMER	Visualizing Code Patterns in Novice Programmers	15
Dana KLAMUT	Improved Database Performance for Internet of Things Devices	15
Kyla REID	Advanced and Solid Querying on Embedded Devices	15
Robert HILL	Toolbox for Convex Piecewise-defined functions	16
Zifang JIANG	Dynamic visualization of piecewise-linear quadratic functions	16
Megan KURZ	Global Optimization for Road Design Optimization	16
KT NGUYEN	A multi-response model for microfluidic-based gas detectors	17
Levi MILLER	Applying a Novel Polynomial basis to a Reed-Solomon Decoder.	17
Phillip SHREEVES	Addressing Overfitting in Mixtures of Factor Analyzers	17
Wan Pei Michelle POH	Do You Express Your Emotions? A Cross-Cultural Study	18
Michelle SCHROTH	Habits and Happiness: How to Create Lasting Change.	18

Paul LUTZ	From Moral Identity to Flourishing: A Pathway of Self-Transcendence and Meaning in Life	19
EME 1121		
Stephen COLLINS	Optimizing Iterative Image Reconstruction Methods in Optical CT Radiation Dosimetry	19
Sabrina MADSEN	Measuring the Permeability of Arrays of Split-Ring Resonators using a Loop-Gap Resonator	20
Dakota MCKEOWN	Quantifying the Performance of Next Generation X-ray Detectors	20
Robert LALONDE	Modelling x-ray system performance in mammography	21
Sean COLFORD	Efficiency of Shear Driven Flow in Power-Law Fluids	21
Stephanie GALATA	Thin Matter Shell Collapse in a Vaidya-Vaidya Exterior Black Hole	21
Aravis WALTERS	Lay Perceptions of Non-Offending Pedophilia	22
Larissa JUST	Sexual Victimization in Men and Women	22
Alissa YARGEAU	Paraphilia's and the Dark Triad: An Examination of Dark Personalities Sexual Interests and Behaviours	23
Audra DAVIS	Reframing Happiness: Can you Picture it?	23
Jessica HANSEN	Computerized Street Crossing Exercise for Neglect Patients	23
May LY	Validation of the Translated Negative Physical Self Scale	24
Leah SORGE	Finding the Fakers: Use of Eye Tracking during the Wisconsin Card Sorting Test as an Intrinsic Test of Effort	24
Chelsea TINGLEY-WEISGERBER	Investigating the Dream Content of Dark Personalities	25

13th Annual Undergraduate Research Conference

"It matters very much whether you care that they live or die": British Columbia Newspaper Responses to Jewish Persecution in Europe, 1933-1939

EME 1101; 10 - 10:20

Student: Nathan LUCKY

Supervisor: Brigitte Le Normand

This paper examines the responses of the British Columbia press to Jewish persecution in Nazi Germany and Europe from 1933 to 1939. Using the Vancouver Jewish community paper as its focus, the study juxtaposes its responses with three non-Jewish papers. Vancouver Jews responded to the persecution of their coreligionists in Germany and Europe by countering neutral and skeptical reporting in the mainstream papers with consistent, explicit reporting of persecution. The small community of Jews attempted to establish themselves among the wider Jewish community in Canada and the world by marshaling divided Jewish communities toward a common effort to help European Jews through fundraising efforts as well as appeals to allow Jewish refugees into Canada. Sometimes, they broke with strategies set by the eastern-based Canadian Jewish Congress. When sympathy for European Jews peaked in Canada in the late 1930s, they adapted their messaging to appeal to mainstream Canadian views by calling for "refugees" and "immigrants" to enter the country, frequently running stories to dispel myths circulated in the non-Jewish papers about refugees and the economy to change minds and gather enough support to convince Canada to open its doors. Finally, they began to emphasize that the threat of fascism was not a Jewish problem, but a crisis of civilization that threatened all who opposed it.

Sugar Babies Among Female Canadian University Students: Sweet or Unsavoury?

EME 1101; 10:20 - 10:40

Student: Nicole TOMASIC

Supervisor: Carey Doberstein

For my PPE Directed Studies I am exploring and researching the phenomenon of female Canadian university students becoming "sugar babies." That is, young women who are choosing to support themselves during their academic career either in part or in full by dating or establishing relationships with, usually older, men for compensation, which is known as "sugaring." These relationships do not necessarily entail sexual relations, although it is heavily implied that they do. Some of the questions I am trying to answer are as follows: Is sugaring different from prostitution or escort services, and if so, how? Is the corresponding rise in numbers of female Canadian university students sugaring and post-secondary education costs merely a correlation, or does it indicate a causal relationship within this population? Is sugaring wrong or harmful, and if so, why or how? What are the legalities surrounding sex work in Canada? How do opposing feminist camps reconcile sugaring? What factors, including and in addition to financial considerations, might be driving female Canadian university students to begin sugaring? So far in my research, I have found more questions than answers, and the whole sugaring landscape seems rather bizarre.

Live and Die by the Revolution: A History of Populism in the Republican Party and the Front National

EME 1101; 10:40 - 11

Student: Jaclyn SALTER

Supervisor: Carl Hodge

The current literature on populism in Western democracies either examines populism theoretically, uses comparative case studies, or studies the history of populist parties as a phenomenon. There is very little literature that explores populism in the context of established parties. This paper starts filling that gap by creating a more cohesive theory of populism and using it to explore the development of populist sentiments in the American Republican Party and the French Front National. Both parties come from countries with a secular republican history and revolutionary ideological heritage, and they were both founded to challenge the established political order of their time. This paper examines the ideologies motivating both parties and how key moments shaped the way each party campaigned or governed, before looking more closely at how they became a home for this most recent surge in populist politics. Populist forces in France and the United States have many common characteristics, but their potential is mediated by the peculiarities of national political contexts. Both parties gave populism a space to grow that the establishment leaders assumed could be controlled and have since discovered otherwise.

Cooperation with the Appearance of Competition: The Canadian Pacific and Canadian National Railways in the Okanagan, 1920-1935

EME 1101; 11 - 11:20

Student: Jack WILSON

**Supervisor: Julien Vernet
Roger Sugden**

British Columbia’s Okanagan Valley was neither unique nor isolated in Canadian history, as is sometimes presented in historiography of the region. Two transcontinental railways, the Canadian Pacific Railway (CPR) and Canadian National Railway (CNR), connected Okanagan fruit growers to markets in provinces east of British Columbia. During the Great Depression there was a nation-wide investigation into the debt of the railways (the Duff Commission), which spawned a local investigation in the Okanagan (the Cooperative Committee). In both of these investigations the railways looked at ways in which they could maximize their profits through forms of cooperation. The railways sought measures to cooperate while maintaining the appearance of competing, in order to limit potential negative reactions from the public. While concerns over public reaction discouraged the most extreme form of cooperation, i.e. amalgamation, these concerns did not prevent the railways from pursuing extensive means to cooperate in the Okanagan. By showing that similar considerations were present in the national and local efforts of the CNR and CPR, the presentation will demonstrate that the Okanagan was not removed from the wider Canadian economy. Rather, they were well integrated, through the relationship of the Okanagan with the two railways.

Speaking Worldviews: The Implications of Expressing Trauma and Anxiety Through Conlang

EME 1101; 11:20 - 11:40

Student: Shaniya ANAND

Supervisor: Christine Schreyer

As per the theory of linguistic determinism, language is able to shape the way in which people view and interpret the world. The vocabulary that people have access to is what allows them to respond to and think about different aspects of life, but there are many ideas and concepts which are difficult to express through already existing English vocabulary. [gtɛo] is a conlang (constructed language) meant to be used in conjunction with English vocabulary. I have created [gtɛo] with the intention of being able to fill certain gaps in understanding regarding anxiety and trauma related concepts that English does not acknowledge. Specifically, I created the language to be used by people who live with anxiety or PTSD in a therapeutic or community-building context. Concepts of trauma are intrinsically understood within the language, and concepts that are not as easily communicated in English are expressed in a much more succinct manner. This also makes it easier for speakers to provide situational context, information about themselves and their experiences, and insight into their current state of mind. As there are increasingly large numbers of people living with PTSD and anxiety globally, the implications, benefits, and functions of a constructed language that is centered around these concepts are worth taking into consideration. This presentation examines the functions of this language, how it is structured to be easily learnable and understandable for English speakers, how it facilitates communication for people with PTSD and anxiety, and how it validates their experiences and normalizes their reactions and worldview.

On the Topic of Social Housing and how it pertains to Philosophy, Politics, and Economics

EME 1101; 11:40 - 12

Student: Laura FYLYSHTAN

Supervisor: Noriko Ozawa

The need for affordable housing is well known and documented within government and advocacy circles. Indeed, social housing, in its various forms, has been around for over seventy years. However, despite this awareness, the level of government assistance provided to society has never been sufficiently high enough to eradicate the need for affordable units. This study explores the issue of affordable housing by looking at social housing development in the Toronto region during the period of 2000-2017 and assesses the potential impact of the National Housing Strategy recently proposed by the Trudeau government. Social housing, as it pertains to this study, is a general term for rental housing which is owned and managed either by the state or a non-profit organization. I explore what societal hesitations have kept social housing from being enthusiastically embraced and place a specific focus on the economic realities of providing social housing and the consequences of refraining. This talk will expand on the failures of the market to meet the housing needs of all societal brackets, the limiting effects of class interest on public housing, and the need as a society to reconceptualise the idea of a just political economy.

Moving toward Harm Reduction: An analysis of the Canadian government's new policy regarding supervised consumption sites

EME 1101; 12:40 - 1

Student: Joshua TAFEL

Supervisor: Ross Hickey

This project provides an in-depth analysis on the Canadian government's new harm reduction policy approach which has allowed for numerous supervised injection sites (also known as consumption sites) to open across the country in the past year. Specifically, it addresses the following question: Do the recent amendments to the Controlled Drugs and Substances Act regarding supervised consumption sites reflect the best policy approach to problematic drug use? I address this question by examining political, economic and moral components. Starting with an overview of the history of supervised consumption sites in Canada, I then introduce ethical arguments for and against the approach, including economic cost/benefit arguments and a look at which political groups support and oppose this. I then discuss whether this approach is the best and if or how it can be improved.

Analyzing discrepancies in wildlife habitat modelling methods between Alberta oil sands environmental assessments

EME 1101; 1 - 1:20

Student: Mac CAMPBELL

Supervisor: Adam Ford

Resource extraction may negatively impact the habitat of many ecologically - and culturally - important wildlife. Provincial and federal agencies evaluate the impacts of proposed resource extraction projects through the Environmental Impact Assessment [EIA] process. Typically, EIAs estimate the amount and quality of habitat affected by the proposed project to determine the significance of impacts on the environment. These estimates inform the processes of impact mitigation and/or reclamation. There are several methods available to estimate habitat that vary in their underlying assumptions and objectivity; however, there is no regulatory guidance or standards of evidence required for proponents in the development of habitat models in an EIA. Moreover, proposals often focus on 'indicator species' - a subset of the species present in the project area. The selection of indicator species is also subjective, and typically focuses on large mammals. There has been no systematic review of how habitat is measured or for which species in EIAs. So, in an attempt to remedy this, our work this year involved extracting wildlife habitat modelling data from the EIAs of 30 Alberta oil sands projects. We found large discrepancies between projects in terms of which methods, species and habitat types were used. This suggests a need for greater objectivity and standardization throughout wildlife assessments, if mitigation and reclamation are to be successful conservation strategies.

Can 'big game' species be used as indicators to help direct conservation funding in British Columbia?

EME 1101; 1:20 - 1:40

Student: Sarah FALCONER

Supervisor: Adam Ford

We are currently in the midst of a sixth mass extinction event – but people are causing this one, with negative outcomes for biodiversity and ecosystem services. There are limited resources available to be used in conservation efforts, with attention directed towards charismatic species. This attention usually leads to better funding and conservation outcomes when compared too less well-known species. It is unknown the extent to which the conservation of popular species has a positive effect on less-well known or endangered species. So-called “big game” species receive some of the highest conservation attention of any species, receiving both funding and management from the government and hunting groups. We asked – “can game species serve as conservation surrogates for other forms of biodiversity?” We used province wide data (obtained from the Conservation Data Centre) on species-habitat associations in order to assess the habitat overlap between 11 big game species: elk, big-horned sheep, mule deer, white tailed deer, moose, grizzly bear, cougar, wolves and black bears, and 1160 other terrestrial species in British Columbia, including birds, plants, small mammals, and insects. Association coefficients for each species were assigned using a conditional entropy metric in the “netassoc” package in R. On average, game species had stronger association with other species, suggesting that they would serve a useful role as conservation surrogates in British Columbia. The strength of association for game species was comparable to many of the top-ranked non-game species, suggestion that game species are not ‘exclusive’ in their role as surrogates. Understanding which non-game species are likely to benefit from, or be missed by, the conservation efforts directed at game species can help focus limit resources in order to conserve biological diversity in British Columbia.

Comparison of Yeast Populations in an Okanagan Winery and Vineyards

EME 1101; 1:40 - 2

Student: Brianne NEWMAN

Supervisor: Dan Durall

The wine yeast that are present in a fermentation influence the outcome by producing various metabolites that alter the sensory characteristics of wine. The most common way of fermenting uses known strains of the wine yeast *Saccharomyces cerevisiae* that are inoculated into grape must to give a consistent product. However, uninoculated or spontaneous fermentations can be carried out by the yeast already present in the vineyard or in the winery. These spontaneous fermentations often give more complex and unique products due to the presence of different species and strains in grape must. Yeasts are found throughout vineyards, especially on the surface of grapes, and during the process of harvesting. These yeasts can end up in the grape must where they are able to begin fermenting, which influences the final characteristics of wine. The objective of this study was to compare yeast species and strains (*S. cerevisiae* or *S. uvarum*) between 6 different vineyards. Spontaneous fermentations using grapes collected aseptically from the vineyards were carried out in the laboratory, away from the winery environment. Sampling occurred at the initial juice stage, two-thirds sugar depletion, and the end of fermentation in order to ensure an accurate representation of the yeast communities and populations throughout fermentation. Culture dependent techniques were used to isolate colonies. DNA was extracted from the yeast isolates and was subsequently amplified using 11 microsatellite loci, which generated a finger print for either *S. cerevisiae* or *S. uvarum*. Species and strains found at each stage of fermentation and in each vineyard will be compared and discussed.

Therapeutic for all? Observational assessments of therapy canine stress in an on-campus stress-reduction program

EME 1101; 2:20 - 2:40

Student: Haley SILAS

Supervisor: John Tyler Binfet

Animal-assisted therapy (AAT) is a growing field, and domestic dogs are one of the most common species that people have relied upon for support in classrooms, airports, hospitals, and courtrooms. Therapy dogs are also used to support students on the campuses of post-secondary educational institutions, especially during exam periods. AAT has demonstrated positive outcomes for human stress levels; however, little is known about the effects of AAT on dogs. The aim of this study was to assess stress as an indicator of well-being in working therapy canines. Forty therapy dogs, working in an on-campus stress reduction program, were observed by three distinct observers: handlers, student clients, and a trained researcher. Using a visual analog scale, study participants rated perceived stress of the dogs based on behavioral indicators including trembling, yawning, nose licking, paw lifting, and turning away. We examined factors that may explain levels of stress in dogs, including dog age, handler experience, handler stress, number of students in a session, stress level of students, etc. The results of this analysis indicated that dogs generally experienced low levels of stress. The exception to this finding was that dogs whose handlers had higher initial self-ratings of stress were rated as having significantly higher end of session stress levels. This supports an emotional contagion or spillover model of stress within sessions whereby handlers and not student clients contribute to the affective experience of working dogs. The practical implications of the findings for on-campus therapy programs are discussed.

Impact of acute oral ketone monoester supplementation on monocyte NLRP3 inflammasome activation in humans with prediabetes

EME 1101; 2:40 - 3

Student: Genevieve MYLOCOPOS

Supervisor: Jonathan Little

Impaired glucose tolerance, also referred to as prediabetes, increases the likelihood of developing type 2 diabetes (T2D) and is an independent risk factor for cardiovascular disease and mortality. A fundamental hallmark in the pathogenesis of IGT and other metabolic disorders is chronic low-grade inflammation brought on by the overstimulation of innate immune cells. An important signalling pathway implicated in chronic inflammation is the nucleotide-binding domain, leucine-rich repeat family, pyrin domain - containing - 3 (NLRP3) inflammasome pathway, which plays a prominent role in the generation of two key pro-inflammatory cytokines, interleukin-1 β (IL-1 β) and interleukin-18 (IL-18). With the rising incidence of prediabetes and T2D, a new treatment with the potential to reduce chronic inflammation could be of great therapeutic value. In recent cell culture and animal studies, the metabolically important ketone body beta-hydroxybutyrate (β -OHB) was shown to have therapeutic potential by reducing NLRP3 inflammasome-mediated inflammation; however, this has yet to be studied in clinical human populations. The overarching aim of this research is to determine if directly raising blood β -OHB via administration of an oral ketone monoester supplement, (R)-3-hydroxybutyl-(R)-3-hydroxybutyrate, will exhibit anti-inflammatory effects by inhibition of the NLRP3 inflammasome pathway in participants with prediabetes. In order to determine if these supplements possess direct anti-inflammatory effects in humans, caspase-1 activation and pro-inflammatory secretions of IL-1 β and IL-18 are measured before and after participants consume the ketone supplement. Caspase-1 activation is being measured in lymphocytes, monocytes, and neutrophils by flow cytometry using the FAM FLICA assay. Cytokine secretion levels are being measured via an enzyme-linked immunosorbent assay in supernatants of stimulated whole blood cultures. Participant recruitment and data collection are ongoing and results will be updated for presentation.

Study of glutamate receptors (iGluR6) via imaging and electrophysiology

EME 1101; 3 - 3:20

Student: Joseph GASPARI

Supervisor: Frederic Menard

An estimated 600,000 people in Canada today are living with Alzheimer's disease (AD) with an expected 66% increase in the next 15 years, making this one of the biggest problems in modern medicine. New advancements in neurobiology have been focused on the role of glial cells in synaptic elimination within the brain. The intimate connection seen between astrocytes and the neuronal synapse have sparked an investigation into their ability to communicate via calcium signaling: a process necessary in maintaining healthy synapses. The influx of calcium in astrocytes is triggered through the specific binding of glutamate to ionotropic glutamic acid receptors known as kainite receptors (iGluKs). This subset of receptors has been found to be located on both the postsynaptic terminal of neurons and astrocytes, making it an ideal target to elucidate the effects of calcium in synaptic elimination. Current methods are insufficient as they do not allow for investigation of the receptors within live cells, thus a robust means to monitor and control for iGluKs must be created. To accomplish this our lab has created a chemical probe with a fluorescent tag designed to mimic the native iGluK ligand. Once bound to tissues in vivo, fluorescent imaging techniques can be utilized to study the receptors in real time. The goal of this project is to validate the chemical probes ability to bind to the receptor's active site without perturbation to its function. Through the use of electrophysiology and genetic engineering, we will be able to quantitatively measure the degree of activation of the new chemical probe to that of the natural ligand.

Sulfonium Chemistry: A Nature-Inspired Approach to Label Proteins

EME 1101; 3:20 - 3:40

Student: Alexander CONWAY

Supervisor: Frederic Menard

My research project focuses on designing a synthetic molecular probe that can label a protein at a lysine residue. I will target the well-characterized and understood protein dihydrofolate reductase (DHFR). This protein has an available lysine residue for fluorescent tag attachment. Additionally, the assays for this protein are established in the literature for quick purification and labelling assessment. Above all, DHFR will provide a proof of concept to validate this strategy. Once validated, it is anticipated that the design of this probe can be used to selectively label a variety of other proteins such as those involved in neurodegenerative diseases.

How biosolids impact American Kestrel (*Falco sparverius*) nest site selection and diet

EME 1151; 10 - 10:20

Student: Megan BUERS

Supervisor: Karen Hodges

The American Kestrel is a small falcon species that has been in decline throughout North America since 1974; however, kestrels in food-rich areas do better. Restoring grasslands and increasing the amount of food available leads to an increase in kestrel numbers. I examined kestrel ecology on a cattle ranch in interior BC that is using biosolids to increase soil productivity and water retention on previously overgrazed pastures. I located kestrel nest sites and collected regurgitated pellets of prey remains on OK Ranch (located near Jesmond, BC) and I compared results to a nearby control site. My results indicated that biosolids do impact the diet of American Kestrels. On pastures with biosolids, kestrels ate mostly small mammals (74%) and some insects (15%, predominantly

grasshoppers); in contrast, on unapplied land they ate fewer small mammals (60%) and more insects (25%). This discrepancy can be explained by American Kestrels hunting on the ranch for larger prey such as small mammals because they are more abundant due to the application of biosolids; conversely, on unapplied land they are having to substitute more of their diet with smaller prey such as insects. Biosolids increase vegetation productivity, increasing the amount of food available for small mammals and insects, thus leading to more food for American Kestrels to eat. Although the cause of the American Kestrel decline is unknown, biosolids land applications could offer more food-rich habitats that might buffer against habitat degradation and other anthropogenic disturbances.

Diet composition of raptors and corvids on a mixed woodland/grassland ecosystem

EME 1151; 10:20 - 10:40

Student: Arianna ORMROD

Supervisor: Karen Hodges

Central British Columbia's mixed woodland/grassland ecosystem is host to a wide variety of birds of prey. Short-eared owls (*Asio flammeus*), long-eared owls (*Asio otis*), and northern harriers (*Circus hudsonius*) all live and hunt on the same landscape. Corvids such as common ravens (*Corvus corax*), American crows (*Corvus brachyrhynchos*), and black-billed magpies (*Pica hudsonia*) share the same landscape for hunting and foraging. While the life history of each of the birds is well known, little research has been done on their diet composition. Over the course of a summer, corvid and raptor pellets were collected from beneath nest sites and fence posts at the OK Ranch west of Clinton, British Columbia. I identified the pellets by species and dissected them to identify major prey species for each bird. My results show that short-eared and long-eared owls and northern harriers all share a similar diet composition; over 95% of their pellets consisted entirely of vole remains. The corvids likewise share similar diets comprised of several species of plants, grasshoppers, and beetles. Ravens occasionally consumed small mammals and small birds as well. Over the course of the summer, corvid diet shifted from primarily grass and beetle in the spring to grasshopper and berries in the mid and late summer. My results indicate that owls and harriers consume the same prey species, but it is not clear if they are in competition or if the prey is abundant in the ecosystem. Corvids have more varied diets that shift seasonally, suggesting that they experience less prey overlap and have less chance for competition.

Identification of genetic and biochemical differences among *Botrytis cinerea* and *Alternaria* spp. isolates, postharvest pathogens of sweet cherries in the Okanagan

EME 1151; 10:40 - 11

Student: Corinna KARPENKO

Supervisor: Louise Nelson

Sweet cherry production and processing across Canada contributes millions of dollars to the country's agricultural and agri-food sectors. Postharvest disease, commonly known as fruit spoilage, is the main biotic factor that affects yield and quality of cherries and is caused by several fungal pathogens. Two fungal species of importance in the Okanagan include *Botrytis cinerea*, which infects cherry blossoms and wounds on mature fruit, causing grey mold, and *Alternaria* spp, which include similar yet different effects depending on the strain. Because varying levels of disease severity occur in different orchards, it is important to understand the biochemical and genetic characteristics of these pathogens. In this study I screened 13 isolates, obtained from orchards across the Okanagan in 2016-2017, for strain differences using PCR amplification of various loci and genetic microsatellite markers within each species. Primer pairs specific for *B. cinerea* and *Alternaria alternata* were tagged with fluorescent dyes FAM, NED, or VIC to visualize allelic diversity at defined loci using GENEMAPPER. *B. cinerea* isolates P201, P403, P501, and BSt03 and *Alternaria* spp. isolates PbStu, BaSe04, and BhS03 were found to have the largest allele size variation. Each isolate was tested for pathogenicity on Staccato and Sentennial cherry varieties by inoculating spore solutions containing 1×10^3 spores/10 μ L of each isolate into sterile surface wounds on each cherry variety and incubating at 22°C for 6 days. The infection severity of each isolate was calculated using the percentage of cherries infected and the average lesion diameter at the wound site from 3 replicates each containing 10 cherries. On

Staccato cherry, infection severity of isolates from most to least severe were P201, P501, P403, and BSt03 for *B. cinerea* and PbStu, BaSe04, and BhS03 for *Alternaria* spp. On Sentennial cherry, infection of isolates from most to least severe were BSt03, P501, P403, and P201 for *B. cinerea* and BhS03, BaSe04, and PbStu for *Alternaria* spp. Overall, the *Alternaria* spp. isolates showed greater disease severity on Staccato compared to *B. cinerea* isolates, while the opposite was true for Sentennial. The ability of the isolates to produce the extracellular plant cell wall degrading enzymes cellulase, protease, and alpha-amylase was tested on appropriate culture media following growth at 22°C for 7 days. All seven isolates produced cellulase and protease, while only 3 isolates produced alpha-amylase. The ability to use glucose, fructose, sucrose, and dextrin as sole carbon sources was tested for on basal medium supplemented with each carbon source following growth at 22°C for 7 days. All seven isolates were able to use each carbon source, but growth rates varied. Occurrence of increased resistance to traditional synthetic fungicides used in the field highlights the importance of needing a more strategic approach to control and treat these fungal pathogens. With knowledge of the differences in the biochemical basis of disease among isolates found in this study, application of appropriate biocontrol agents may be used to increase yield and quality of the cherries in the Okanagan.

Effects of Nitric oxide Producing Bacteria *Azospirillum brasilense* on *Cannabis sativa* Microbial Composition, Cannabinoid and Terpene Content

EME 1151; 11 - 11:20

Student: Emily O'BRIEN

Supervisor: Mike Deyholos

Due to the upcoming legalization of *Cannabis sativa*, new research opportunities have arisen allowing for the study of its unique assortment of secondary metabolites. While the biosynthetic pathways leading to the production of the cannabinoid acids and terpenes are well understood, studies regarding their elicitation have been largely inconclusive. Through exogenous application, an array of phytohormones have been linked to increased or altered cannabinoid and terpene production, specifically stress hormone abscisic acid (ABA) and flowering hormone jasmonic acid (JA). Due to limitations in exogenous hormone application, however, the effects of short-lived phytohormone nitric oxide (NO) have not been assessed, despite implications of its involvement in the elicitation of cannabinoid production. In this study, *Cannabis sativa* plants of a high Δ^9 -tetrahydrocannabinol (THC) cultivar were inoculated with *Azospirillum brasilense*, a plant-growth promoting rhizobacteria capable of producing NO. Plants were grown under standard conditions in a coconut fibre medium for 60 days. At this time, floral inflorescence were harvested and total terpene and cannabinoid content was analysed using Gas Chromatography Mass Spectrometry and High Performance Liquid Chromatography, respectively. In addition, soil samples were taken prior to inoculation and at harvest. From these samples, total microbial DNA was extracted and analyzed at Thompson Rivers University using next generation sequencing of the conserved 16S region. This talk will discuss the effect of *A. brasilense* on *Cannabis* terpene and cannabinoid content, as well as its effect on microbial community composition and density. We hope to emphasize with these results the importance of biofertilization in this emerging agricultural field.

Asymbiotic trait variance in *Rhizoglyphus irregularis*: Is in vitro propagation decreasing intra-isolate variation and producing more ruderal isolates?

EME 1151; 11:20 - 11:40

Student: Thea MILES

Supervisor: Miranda Hart

Arbuscular mycorrhizal fungi (AMF) form ecologically important symbioses with most terrestrial plants, in which the fungi provide biotic and abiotic benefits to the plant host in exchange for carbon. Interest in AMF to complement inorganic fertilizer use for sustainable agriculture has resulted in demand for quality inoculum. Presently, in vitro propagation using transformed root cultures is the best method for producing abundant and contaminant-free inoculum. *Rhizoglyphus irregularis* (syn. *Rhizophagus irregularis*, *Glomus intraradices*) is the most commonly used AMF species for inoculum production. However, little research has explored the

effects of in vitro propagation on the growth and morphology of *R. irregulare* isolates. The highly controlled, artificial, and regulated environmental conditions inherent to in vitro propagation likely influences intra-isolate trait diversity, and traits pertaining to AMF life history strategies. Specifically, intra-isolate diversity could be decreasing, and isolates might be adopting traits that coincide with an increasingly ruderal life history strategy. As a first step in studying the effects of in vitro propagation on AMF isolates, the asymbiotic growth stage (in culture without a host root) was examined for *R. irregulare* isolates varying in number of generations propagated in vitro. To investigate whether in vitro propagation affects intra-isolate variation and ruderal traits, we grew single spores in half-strength sucrose-free MS medium on individual petri plates. We compared trait morphology and growth between isolates using photomicrography and image processing.

Exploring sustainable tools in agriculture: effects of cover crop treatments on entomopathogenic fungi

EME 1151; 11:40 - 12

Student: Michelle MACDONALD

Supervisor: Miranda Hart

As detrimental effects of synthetic chemical pesticides are becoming more apparent, more sustainable methods for controlling pests in agriculture must be explored. An ideal method would have minimal chemical application and would look at crops as an ecosystem, considering all plants and microorganisms in the system. Classical tools in this field are cover crops (non-crop vegetation) and entomopathogenic fungi (EPF), yet little is known on the effects, if any, these tools have on one another. We investigated if there were effects of four different cover crops treatments commonly used in vineyard systems in the Okanagan Valley, BC, on the EPF already present in the soil. Model insects were exposed to soil from the treatments and the mortality frequency and timing was recorded. Insect cadavers were surface sterilized and placed in a moist chamber to encourage fungal sporulation. Fungi that grew from insect cadavers were isolated and grown as pure cultures, then subjected to PCR amplification and Sanger sequencing. A community analysis will be performed on these results. These results will help make better informed decisions in using more sustainable methods in agriculture and guide further research surrounding this topic.

Investigating the spread of a commercial biofertilizer through non-target vegetation.

EME 1151; 12:40 - 1

Student: Becky LOVEROCK

Supervisor: Miranda Hart

Farmers can take advantage of symbiotic relationships between plants and microorganisms to increase a plant's overall health and growth. Often seen as a "green" alternative to traditional chemical fertilizers, the use of microbial biofertilizers has become widespread, gaining global market value. In spite of the many purported benefits, the use of biofertilizers comes with an inherent risk: the introduction of exotic organisms to an ecosystem. Arbuscular mycorrhizal fungi (AMF) are a highly common biofertilizer, living within plant roots to increase nutrient uptake. Commercial AMF biofertilizers should be of particular concern when considering the invasion potential of biofertilizers. AMF are known to be non-selective with respect to their plant host, and an individual AMF is able to form associations with multiple plant hosts at once. Once introduced to the intended or target host plant, there is great potential for a commercial AMF biofertilizer to move into the surrounding non-target vegetation. Our research this year involved investigating whether or not a commercially available AMF biofertilizer was invading a local vineyard through non-target vegetation. Randomly selected vines at a West Kelowna organic winery had been previously inoculated with a common AMF biofertilizer in the spring of 2013. We randomly sampled a selection of naturally established plants growing in the driverows between vines. These sampled plants varied in life history strategies, root structure and photosynthetic pathways. DNA was extracted from the plant roots and digital droplet PCR was used to confirm or deny the presence of the commercial AMF biofertilizer. The oral presentation will highlight our ddPCR results and overview the spatial analysis to be completed.

Life Cycle Assessment (LCA) of the Okanagan Cherry Industry

EME 1151; 1 - 1:20

Student: Victoria SANDERSON

Supervisor: Nathan Pelletier

It has been estimated that food systems contribute between 15 and 28% of greenhouse gas emissions when the entire supply chain is considered. Food systems can also lead to unsustainable water use and pollution, deforestation and biodiversity loss. Horticulture production, in particular, involves highly concentrated use of land, water and chemicals which has the potential to severely impact the surrounding environment. The Okanagan region is rapidly evolving as a global horticulture producer, thus understanding and reducing associated environmental impacts is key to guide growth that will be sustainable long-term. The goal of my research is to identify impact hotspots and key mitigation points along the Okanagan cherry supply chain using a screening-level life cycle assessment (LCA). Life cycle assessment is a tool that measures the environmental burden of a product by assessing inputs and outputs along the supply chain. This research is relevant in the Okanagan at the present time for several reasons. First, 95% of cherries produced in Canada are grown in the Okanagan, Similkameen and Creston valleys of BC on a total of over 3500 acres which leads to very concentrated impacts in these regions. The province of BC has also increased funding for tree fruit producers to promote further growth of the industry. In addition, the Okanagan cherry industry has elicited a media response due to the use of helicopters as a means of drying cherries which will be addressed by my research in terms of environmental implications. My methodology involves designing an LCA model of the cherry supply chain from cradle to China, the major export location, in compliance with ISO standards using openLCA software. The data for this model comes from a variety of sources including local cherry producers, experts within the cherry industry, commercial databases, literature sources and government statistics in order to represent the unique growing conditions, processing techniques and export methods of the Okanagan Valley. My model was then scaled to 1 kg of cherries produced and various calculations were conducted in openLCA to determine the effects on various impact categories such as global warming potential, eutrophication, acidification, ecotoxicity and human toxicity. The results of this analysis provide an overall assessment of the various impacts associated with each stage involved in producing, processing and exporting cherries which can be used to inform local cherry growers, horticulture associations, policy makers and consumers. This research will also contribute to the formal literature of LCA studies assessing horticulture production.

Functional Gene Analysis (L001) of PDR class ABC transporter from Lavenders: a yeast model for inhibition assays to detect monoterpene trafficking

EME 1151; 1:20 - 1:40

Student: Michael TARNOWYCZ

Supervisor: Soheil Mahmoud

Lavenders (*Lavandula*) produce essential oils composed of a variety of constituents (monoterpenes) that have commercial value in medicine, cosmetics and the food industry. There is intensive research being done to increase production of particularly important monoterpenes in oil producing plants. Currently, there is very little known regarding the secretion of essential oil monoterpenes into the storage cavity of glandular trichomes. Previous research has uncovered the possibility that ABC (ATP binding cassette) transporters play a role in trafficking these compounds. ATP transporters are part of one of the oldest transport system super-families. They are found in all organisms and hundreds of transporters have been identified. Most eukaryotic ATP transporters are effluxers associated with the opening and closing of ion channels although there are exceptions. Two prominent classes of ATP transporters proteins identified are MDR (multidrug resistance) and PDR (pleiotropic drug resistance). Already it has been demonstrated that an MDR transporter protein (gene LiABC) from Lavender can traffic select monoterpenes. A PDR transporter protein (gene L001) from Lavender was isolated to further test the hypothesis that ABC transporters play a role in trafficking monoterpenes. The gene for the protein was transformed into mutant yeast cells with no other ABC transporter genes and subjected to a series of monoterpene inhibition assays to measure survivability against yeast without the L001 gene. Monoterpenes tested did not yield definite proof of the hypothesis put forth, however the research has generated interesting leads. Understanding monoterpene trafficking in essential oil producing plants is an important component of biotechnical applications. Future work will

continue to link individual or groups of monoterpenes to transport proteins, especially those found at or near glandular trichomes.

Enriched Pedagogy of Flipped-Class Video Design – Student Attitudes and Learning Gains in First-Year Chemistry

EME 1151; 1:40 - 2

Student: Riley PETILLION

Supervisor: Stephen McNeil

A growing body of educational research is demonstrating the improvements to learning gains and student performance that can be promoted by a flipped classroom model in university chemistry courses. A core aspect of the flipped-class model is the student viewing of a pre-class instructional video, allotting time for an in-class activity during the following lecture. Flipped classroom instructional videos were prepared for a first-year general chemistry course at the University of British Columbia's Okanagan campus. Unlike the overwhelming majority of flipped class video resources, these videos are not just narrated screen capture. Rather, they are anchored in live instructor recordings, supplemented by three different presentation modes, each designed for pedagogical correspondence to the appropriate corner of Johnstone's Triangle: narrated screen captures (symbolic), molecular animations (molecular), and experimental laboratory demonstrations (macroscopic). High-quality video production was accomplished using industry-standard software (Adobe Creative Cloud) and professional-grade film and audio hardware. The effectiveness of these videos and the associated flipped-class modules was assessed using a mixed method approach. Semi-structured interviews (N = 12) were conducted to obtain detailed student feedback regarding both student satisfaction and pedagogical utility. Data assessing pre- and post-video knowledge (N = 428), student survey data pertaining to attitudes towards flipped-class and other active learning methods (N = 299), and data from a final exam question concerning a topic presented in a flipped class activity (N = 715) was collected. Statistical analyses and coded interview data indicated general appreciation and higher satisfaction with flipped classroom modules compared to traditional lectures, matched by a general student belief that the flipped modules enhanced their learning. Full details of all data analyses, conclusions regarding the overall effectiveness of the flipped modules, and plans to further optimize the videos based on student feedback, will be presented.

Impact of Changing to More Sustainable Lighting Systems on the Growth of Plants

EME 1151; 2:20 - 2:40

Student: Jillian FORSYTH

Supervisor: Susan Murch

Statistics Canada found that greenhouse grown products including greenhouse flowers and plants, nursery products, and sod products were sold for \$2.3 billion in 2016 (1). Greenhouses in Canada cover over 23 million square meters. A 2011 survey of the horticulture industry in Alberta found the costs of vegetable production ranged between \$94.54 per square metre for tomatoes to \$125.83 per square metre for bedding plants/ornamentals (2). Much of this cost is generated by the electricity that powers lighting systems. Light Emitting Diodes (LEDs) use less electrical input and emit more useful light for growing plants (3) but the different wavelengths available can alter plant growth. I hypothesized that changes in light spectra will have unknown effects on plant growth and chemistry. To investigate this hypothesis, exposed axenic cultures of *Hypericum perforatum* (St. Johns Wort), *Scutellaria* species (skullcap) and *Crescentia* sp. to red, blue, green or white LED lighting with standard daylight spectrum fluorescence lights as control. Five phytohormones, serotonin, melatonin, indole-3-acetic acid, abscisic acid and jasmonic acid, were quantified by ultra performance liquid chromatography-tandem mass spectrometry (UPLC-MS/MS) to determine the effects of the lighting on plant growth regulation and stress responses. The results show that in St. John's Wort, melatonin concentration is significantly affected by light spectra with the highest values in green light, and decreasing concentrations in the order of red, blue, white and fluorescent light ($p < 0.001$). In *Scutellaria lateriflora* and *S. galericulata*, the concentration of abscisic acid (ABA) was the highest under white (full spectrum) LED light ($p = 0.004$ and $p = 0.012$, respectively). ABA concentration in *Scutellaria galericulata* had a decreasing trend

under exposure of green, blue and red LED light. It is important to optimize the growth of plants in greenhouses to ensure that these crops are produced efficiently, to reduce costs of food production and to increase the sustainability of the greenhouse industry in Canada. Footnotes: 1. Statistics Canada (2016). Snapshot of Canadian Agriculture: Chapter 4. [online] Available at: <http://www.statcan.gc.ca/pub/95-640-x/2011001/p1/p1-04-eng.htm> [Accessed 25 Feb. 2018]. 2. Laate, E. A. (2013). The Economics of Production and Marketing of Greenhouse Crops in Alberta, 48. 3. Mattson, N. (2016). Greenhouse lighting. Cornell University, 2(September), 1–3.

Psychometric Evaluation of the Attitudes Toward Sexually Predatory Behavior - Revised (ATSPB-R) Questionnaire

EME 1151; 2:40 - 3

Student: Erik WANDINGER

Supervisor: Jan Cioe

Sexual coercion (SC) is defined as the use of pressure, alcohol, drugs, or force to achieve sexual contact with someone who has already refused a previous sexual advance. Several negative outcomes are associated with being a victim of SC, including sexual performance anxiety and depression. To better understand SC, some research has investigated perpetrators of it. The Attitudes Toward Sexually Predatory Behavior – Revised (ATSPB-R; O’Connell & Marcus, 2016) was developed to assess heterosexual men and women’s attitudes toward coercive and manipulative sexual behaviour by asking them to rate several vignettes depicting such behaviour. This study examined the psychometric properties of the ATSPB-R, with emphasis on determining the efficacy of the female version, which was derived by flipping the pronouns from the original male version. Participants were recruited from the University of British Columbia – Okanagan and Reddit to complete the ATSPB-R online. The Sexual Experiences Survey Revised - Short Form Perpetration (SES-SFP; Koss et al., 2007), a well-validated questionnaire concerning past perpetration of coercive and manipulative sexual behaviour, was also administered. Exploratory factor analyses revealed different factor solutions for the male and female versions, suggesting that the ATSPB-R does not function equivalently across gender. Confirmatory factor analyses supported this finding. Item response theory was used to more specifically examine which vignettes did not function equivalently across gender, providing clues about which strategies may not be utilized by males and females in the same way. Multiple hierarchical regression found that ATSPB-R scores predict SES-SFP for males and, to a lesser extent, for females. These findings suggest that, although the ATSPB-R is effective at describing latent attitudes toward manipulative and coercive sexual behaviour, it is not measuring the same latent construct across gender. These findings justify future research devoted to the production of a more specifically tailored female version.

The Interactions of Drosophila E3 Ubiquitin Ligases in the Sensitized Eiger Overexpression Background

EME 1151; 3 - 3:20

Student: Allyson DYCK

Supervisor: Philip Barker

Tumor Necrosis Factor Receptor (TNFR) signalling is a crucial part in the regulation of apoptosis, and its dysregulation can be associated with various neurodegenerative diseases. The TNFR signalling pathway is evolutionarily conserved in *Drosophila melanogaster*, with only one TNF ligand: Eiger. Studies of Eiger have previously yielded insight into fundamental elements of TNFR signalling, thus the purpose of this thesis is to discover conserved ubiquitin ligases that interact with Eiger-mediated cell death by screening knockdown effects of 25 RNAi lines representing 11 ubiquitin ligases in an Eiger overexpression background. The aim was to identify at least one target of interest and identify its substrate and its ubiquitin ligase activity. It was found that 5 individual RNAi lines of 5 different genes significantly suppressed the Eiger-induced small eye phenotype: Sex Combs Extra (Sce), Cbl, Seven in absentia (Sina), meiotic-p26 (mei-p26), and CG16781. It was then determined that the best target of interest of these 5 was Sce, due to a clear functional homology with mammalian RING1 proteins as conserved subunits in the Polycomb Repressive Complex (PRC1) which are required for transcriptional repression. Sce/RING1 contributes to PRC function via ubiquitination of histone 2A (H2A). Our

hypothesis is that the Eiger-induced small eye phenotype occurs via Sce ubiquitination of H2A. We tested this by Western Blot, but unfortunately the results were inconclusive due to imperfect nuclear extraction techniques. The 5 genes identified by the screen highlight that ubiquitin ligases may play a part in TNFR signalling, thus expanding on the field's understanding of this crucial signalling pathway. Furthermore, these genes are conserved, and for at least Sce and Sina, these genes possess homologous functions, thus providing promise that these results can be applied to mammals and could pave the way for future studies.

3D Reconstruction of Rolling Cells using Computer Vision Techniques

EME 1153; 10 - 10:20

Student: Riley WATERS

Supervisor: Abdallah Mohamed

Many biological cells undergo a process called rolling adhesion in which they passively attach themselves to surfaces while under shear flow. Dr. Isaac Li has studied the rotation and adhesion of these cells by using dark-field imaging to reveal trackable granules on the surface of leukocytes. The videos of these rolling cells allow researchers to make observations and measurements, but do not provide any interactivity. We have devised a method and developed a system that uses Computer Vision techniques to analyze videos of rolling cells (specifically human promyelocytic leukemia cells) and construct accurate, interactable 3D representations of them. The method extracts the size and location of adhesion points in each video frame using mathematical morphology and Hough transformation algorithms. This information is used to determine the movement direction of the points and map them to a reference 3D model. An optimization procedure is then utilized to increase the accuracy of the resulting model. This system will aid researchers by giving them a malleable view of the cells surface and the distribution of its adhesive properties. Furthermore, simulations could be applied to the 3D reconstructions to test how the cell would react in different scenarios. This presentation will detail the different components of the method, present the results of the created system, and compare the method to other 3D reconstruction techniques.

Predators become the prey: using statistical machine learning and computational linguistics to detect sexual predators

EME 1153; 10:20 - 10:40

Student: Norbert EKE

Supervisor: Abdallah Mohamed

According to the Crimes Against Children Research Center, one in five U.S. teenagers who regularly use the Internet have received an unwanted sexual solicitation via the web. There is an increasing danger in online environments such as chat-rooms, where online predatory behaviour is more and more frequent, and creates an unsafe environment to minors. This project aims to design an approach for online communities to enhance their member's safety by detecting malicious conversations. This project joins the powers of computational linguistics with statistical machine learning to decipher the insight lying in conversations, then make predictions on whether or not a specific conversation should be flagged for containing sexual predatory behaviour. The contribution of this novel approach is 2-fold: firstly, it is able to capture the contextual details by putting an emphasis on insight that lies within the conversation, and secondly it contains a 2 stage classification system, which is highly flexible and customizable for detecting and classifying other malicious textual data. This talk will focus on presenting the proposed approach, while highlighting results and technical details.

Visualizing Code Patterns in Novice Programmers

EME 1153; 10:40 - 11

Student: Jeff BULMER

Supervisor: Bowen Hui

Many researchers have investigated the difficulties faced by novice programmers. However, these approaches have so far focused primarily on the identification and correction of common syntax errors, or that of topic difficulty in the CS1 curriculum. Meanwhile, poor coding practices adopted by students have gone mostly unaddressed. While these practices may not necessarily lead to erroneous code, they may nonetheless indicate areas of difficulties and lead to poor programming practices. To address these issues, our project examines students' coding habits and common errors in a CS1 programming course. We conducted an experiment to collect new code submissions from 74 first-year students. This data was collected in real-time so that we could reconstruct the thought process of the student while they solved the programming exercises. To assist our analysis, we built a code visualizer that animates the programming process dynamically and summarizes error metrics simultaneously. Our aim is to use the code visualizer to help either an instructor or a student to identify poor programming practices in the programming process. With the error metrics gathered, an instructor can also see potential improvements in coding behaviours for an individual over time, or identifying bad coding habits for students overall. By the end of the project, we will report on the preliminary results on the utility and usability of the code visualizer.

Improved Database Performance for Internet of Things Devices

EME 1153; 11 - 11:20

Student: Dana KLAMUT

Supervisor: Ramon Lawrence

Wearable technology, such as Apple watches, and smart home appliances, like Amazon Echo, are examples of Internet of Things (IoT) devices. IoT devices have impacted society in many aspects of daily life with the purpose of aiding everyday tasks and routines through increased capabilities. IoT and embedded devices collect, process, and analyze data. However, there is very limited support for SQL databases on such devices. This research builds an SQL database on top of the IonDB key-value store. IonDB allows users to store and access the collected data. However, the methods to do so may be unfamiliar and technically difficult for users. As SQL is a well-established standard, building an SQL interface for IonDB makes it more accessible and intuitive to users. This is accomplished by defining an SQL translator that converts user SQL code into executable code on the device during compilation and building. Experimental results were collected on the popular Arduino embedded device.

Advanced and Solid Querying on Embedded Devices

EME 1153; 11:20 - 11:40

Student: Kyla REID

Supervisor: Ramon Lawrence

Ion Field Network is a sensor network project to create a standardized way to store and retrieve data on microcontrollers such as the Arduino boards. The goal is to make it easy to create and deploy sensor networks for use in environmental and industrial monitoring applications. The system builds upon the IonDB library, which provides a key-value store, and allows users to query the data for visualization through a web interface. The current system is limited in flexibility on the queries that can be performed and robustness. In this research, the query parser and processor have been significantly improved to allow for more diverse queries and

robust error handling. Support was also added for queries that can be processed both on the embedded device and on the web platform. This expands the capability of the system and potential use cases by leveraging the UnityJDBC Java library for query processing. Future work involves deploying the system for environment monitoring. Oral Presentation

Toolbox for Convex Piecewise-defined functions

EME 1153; 11:40 - 12

Student: Robert HILL

Supervisor: Yves Lucet

The visualization of a problem can often be the first step to finding a solution. However, this can prove to be difficult in optimization as these problems can be large and complex. By creating a data structure to represent a subset of these problems, we have created a toolbox that allows researchers to view and apply transformations to any piecewise-defined convex quadratic function; any quadratic function of which its domain can be described with one or many polyhedra. These two-dimensional implementations draw from recent research to attempt at optimal run times. This talk will highlight our methods, algorithms used, and present the aforementioned run times of our implementations.

Dynamic visualization of piecewise-linear quadratic functions

EME 1153; 12:40 - 1

Student: Zifang JIANG

Supervisor: Yves Lucet

InterV is a dynamic visualization tool to manipulate piecewise linear-quadratic functions interactively. The benefits and limitations of different implementation frameworks and tools are reviewed. The implementation result includes a set of interactive applets that outputs piecewise linear functions from user's domain inputs using Geogebra. The presentation will demonstrate how math learners can interact with these functions in a fun and dynamic way.

Global Optimization for Road Design Optimization

EME 1153; 1 - 1:20

Student: Megan KURZ

Supervisor: Yves Lucet

Road design has three main problems, the horizontal alignment problem, the vertical alignment problem and the earthwork problem. Often this is solved as separate single level optimization problems as it is faster and simpler. Past work has created a bi-level optimization model which considers the horizontal alignment from a geometric representation. In this study, a single optimization model is built with a modern algebraic modeling language. It uses the same geometric representation for the horizontal problem and includes the vertical and earthwork to provide a single model. The model is represented as a non-convex optimization problem. To solve this globally, deterministic global optimization algorithms must be used. The model was tested by comparing the results from the previous optimization model as well as using the results from the API software from our research partner Softree. Using this model we hope to show that the problem can be computed as a single model and provide a global minimum to at least the simplest of problems.

A multi-response model for microfluidic-based gas detectors
EME 1153; 1:20 - 1:40
Student: KT NGUYEN
Supervisor: Jeff Andrews
<p>Nowadays there is a high demand for natural gas, especially in Canada where there is a massive production of 14.1 billion cubic feet of natural gas per day with a total pipeline length of 67,300km. However, leakage of natural gas from pipelines contributes significantly to irreversible climate change and could lead to accidents, explosion and ruptures. A team of engineers at UBC Okanagan has been developing a highly sensitive and selective microfluidic artificial olfaction gas detector that helps determine the amount of methane and ethane in an environment. Apart from the hardware development of this cheap and lightweight device, integrating a statistical model that helps identify the amount of natural gas quickly and accurately is of high importance. Thus, we have been working towards a novel approach for the analysis of the data generated from these microfluidic-based gas detectors. Data is obtained by exposing the gas sensor to either methane or ethane in a controlled environment for 40 seconds and each experiment lasts 200 seconds in total. Herein, we propose differencing the individual time series, followed by aligning the individual maxima, and then feeding this data into a least absolute shrinkage and selection operator (lasso) model in order to find important timepoints for predicting gas volumes. Our end model is a multivariate multiple regression model that uses significant timepoints and interactions between timepoints to predict concentration of ethane and methane in a mixture. The ultimate goal is to achieve an estimation of ethane and methane concentration that is accurate within 10% of the true value.</p>

Applying a Novel Polynomial basis to a Reed-Solomon Decoder.
EME 1153; 1:40 - 2
Student: Levi MILLER
Supervisor: Wayne Broughton
<p>Reed-Solomon error correction codes are widely used for ensuring data integrity in media such as CDs, DVDs, and QR codes. A fixed value decoder for Reed-Solomon codes exists which involves three steps: polynomial interpolation, calculating a partial gcd (greatest common denominator) of polynomials, and a long division of polynomials. Sian-Jheng Lin and Wei-Ho Chung presented a new polynomial basis which has a recursive structure that allows more efficient polynomial multiplication, as well as an efficient algorithm for their interpolation transform. In this project I am investigating whether this new basis could be used to more efficiently calculate the partial gcd and a long division. If it can, then we could improve the time complexity of the Reed-Solomon Decoder.</p>

Addressing Overfitting in Mixtures of Factor Analyzers
EME 1153; 2:20 - 2:40
Student: Phillip SHREEVES
Supervisor: Jeff Andrews
<p>A commonly used model for unsupervised machine learning, or cluster analysis, relies on the fitting of finite mixture distributions to data, and the most common method for estimating these models is the expectation-maximization (EM) algorithm. Unfortunately, this algorithm tends to experience issues related to overfitting, as well as the more commonly known problem of converging to a local maxima; a value that is not the best possible solution. Mixtures of factor analyzers allow for a factor analysis structure, thus implicitly reducing the dimensionality in the model. Unfortunately, these factor analyzers do not solve the problems with the EM stated above. In order to tackle said issues, we use an algorithm that combines the regular EM with a non-parametric bootstrap, and</p>

show its promise for addressing the problems discussed above on both real and simulated data.

Do You Express Your Emotions? A Cross-Cultural Study

EME 1153; 2:40 - 3

Student: Wan Pei Michelle POH

Supervisor: Derrick Wirtz

Prior research has found that East Asians hide their emotions more than North Americans to maintain harmonious interpersonal relationships. However, Wirtz, Zhu, Li, and Hughes (2016) discovered that North Americans sometimes hide their negative emotions more frequently than East Asians, which contradicts many previous research findings. Furthermore, suppressing emotions from in-group members maintains harmonious relationships, but expressing emotions toward out-group members may foster solidarity and strengthen in-group identity. This may be less apparent among North Americans because they are less concerned with differentiating between in-groups and out-groups. Therefore, this study investigates the extent of cultural differences in expressing emotions based on whether one is interacting with in-group or out-group members, with participants from North America and East Asia. Although earlier research has attempted to investigate the effect of target interactants of the emotions, they are limited to utilizing discrete emotions, or were conducted under experimental manipulation. The current study specifically asks participants to describe their own positive and negative emotional experiences triggered by in-group members and out-group members, and the extent to which these emotions were hidden and shared with others not present at the event.

Habits and Happiness: How to Create Lasting Change.

EME 1153; 3 - 3:20

Student: Michelle SCHROTH

Supervisor: Derrick Wirtz

Happiness and well-being interventions have been shown to increase the general public's well-being at a significant level. Unfortunately, there is evidence to suggest that this increase will return to baseline after as few as two to three months. Our study altered the well-being intervention ENHANCE to include information on the formation of habits. By teaching participants about habits, we hope to reduce the effect of hedonic adaptation on their well-being. The study included three waves of participants being randomly assigned to a MBSR self-help group or an in-person delivered ENHANCE. The first version of the well-being intervention did not include any habit material, while the second taught participants how to create new habits in addition to the activities that have been shown increase their well-being. This study compared the differences between the MBSR group, ENHANCE with habits, and ENHANCE without habits. We anticipate findings to show that three months after treatment has stopped, the participants who were taught habits will have a higher well-being level than the other participants. We believe this will be due to the habit participants repeating the activities more often than the no habit material participants. We also anticipate that the group who is taught about habits will self-report that they are completing positive well-being activities more habitually than the no habit group.

From Moral Identity to Flourishing: A Pathway of Self-Transcendence and Meaning in Life

EME 1153; 3:20 - 3:40

Student: Paul LUTZ

**Supervisor: Derrick Wirtz
Holli-Anne Passmore**

Aristotle (4th century BCE, reprinted 2001) posited that the ultimate striving of human life was eudaimonia, often now referred to as flourishing or functioning well (Keyes & Annas, 2009). Kristjánsson (2007) summarized this goal of eudaimonia as "...the ultimate good and unconditional end (telos) of human beings, for the sake of which they do all other things" (p. 15). Aristotle's conception of flourishing is a highly moralized one. Specifically, in order to flourish, one must embody and implement moral virtues (Han, 2014; Kristjánsson 2010). The internalization and practice of moral virtue has been an enduring topic of interest among identity and developmental researchers (e.g., Lapsley & Narvaez, 2005; Weaver 2006), with some authors suggesting that constructing an identity around moral concerns and commitments is one pathway towards a life of flourishing (Lapsley & Hardy, 2017). Indeed, research has shown that basing one's self-concept around moral traits such as being compassionate, fair, and honest (i.e., having a moral identity) is predictive of eudaimonic well-being (Sage & Kavussanu, 2010). However, little research has investigated pathways by which moral identity leads to flourishing. Self-transcendence, that is, moving beyond the concerns of the self to embrace the concerns of others (Steger, 2017), may be one important pathway to consider. In line with this theorizing, a defining feature of moral identity entails a broader moral concern for the welfare of others (Hart, Atkins, & Ford, 1998; Youniss & Yates, 1999). Furthermore, research has evidenced that moral identity is predictive of a sense of social responsibility, a more expansive moral circle, and volunteerism (Hardy, Walker, Olsen, Woodbury, & Hickman, 2014; Jennings, Mitchell, & Hannah, 2014; Reed & Aquino, 2003)—in essence, self-transcendence. Another pathway by which moral identity may lead to flourishing is meaning in life, comprising a sense of purpose, coherence, and significance (Martela & Steger, 2016). Self-transcendence is a critical aspect of meaning (Steger, Bundick, & Yeager, 2011; Wong, 1998), and meaning itself has been cited as a crucial component of eudaimonic well-being (Ryff & Singer, 1998). Interestingly, moral identity has been shown to be predictive of meaning in life (Han, Liauw, & Kuntz, 2017; Hardy et al., 2013). It is possible that these pathways of moral identity, transcendence, and meaning converge to predict flourishing. In the current study, we examined the hypothesis that moral identity would be linked to flourishing via a serial-mediation pathway of self-transcendence and meaning in life. Undergraduate participants (N = 184) completed measures of moral identity, self-transcendence, meaning in life, and flourishing. Serial mediation analysis supported our hypothesis, evidencing a significant indirect effect from moral identity to flourishing via self-transcendence and meaning in life. These findings suggest that possessing a moral identity may promote a sense of self-transcendence, which in turn may lead to the presence of meaning in life, which ultimately results in flourishing. A number of important implications can be drawn from these findings. In particular, the cultivation of a moral identity through moral educational efforts may hold promise for youth development and the promotion of flourishing lives truly indicative of functioning well.

Optimizing Iterative Image Reconstruction Methods in Optical CT Radiation Dosimetry

EME 1121; 10 - 10:20

Student: Stephen COLLINS

Supervisor: Andrew Jirasek

Modern radiation therapy is characterized by elaborate treatment planning along with precise and complex treatment delivery. This invokes a need for more sophisticated and accurate dose measurement techniques. Researchers have considered whether 3D radiochromic gel dosimetry techniques can provide more comprehensive verifications of complex radiation treatments than current techniques. Radiochromic gels exhibit a color change response to ionizing irradiation and are exclusively imaged with optical CT scanners. Intrinsically, optical wavelength electromagnetic radiation is refracted when changing transmission mediums. Therefore, accounting for refraction during the image reconstruction process is necessary; however, it is not currently implemented in practice. With our prototype optical CT scanner and a novel radiochromic gel formulation, image reconstruction methods accounting for refraction were explored. Namely, methods utilizing iterative reconstruction techniques and a system matrix which encompasses the specific parameters of our imaging system. To provide quantitative measures of image quality, specialized image analysis techniques

were developed. These techniques examine the signal-to-noise ratio, contrast-to-noise ratio, edge detection and prevalence of ring artifacts in each image. Each uniquely reconstructed image was analyzed and compared to determine our optimal image reconstruction method. This method incorporates an optimal system matrix, iterative reconstruction method, and number of reconstruction iterations. This presentation will highlight the image analysis methods developed and how they were implemented to determine our optimal image reconstruction process.

Measuring the Permeability of Arrays of Split-Ring Resonators using a Loop-Gap Resonator

EME 1121; 10:20 - 10:40

Student: Sabrina MADSEN

Supervisor: Jake Bobowski

Metamaterials are artificial materials designed to have properties not found in natural substances. An array of split-ring resonators (SRRs), for example, acts as a metamaterial by exhibiting a negative effective permeability over a narrow range of microwave frequencies. Many researchers depend on numerical simulations to determine the effective permeability of these arrays. However, these simulations have produced, in certain cases, unexpected results. Our research presents a method to experimentally determine the effective permeability of 1-D arrays of SRRs. In our method, these measurements are attained by loading an array of SRRs into the bore of a loop-gap resonator (LGR). An LGR is a microwave resonator that can be modelled as an LRC circuit. The effective permeability of the SRR array alters the inductance which, therefore, alters the frequency response of the LGR. The measured frequency response of an SRR-loaded LGR was used to determine the real and imaginary parts of the effective permeability of multiple SRR arrays as a function of frequency.

Quantifying the Performance of Next Generation X-ray Detectors

EME 1121; 10:40 - 11

Student: Dakota MCKEOWN

Supervisor: Jesse Tanguay

X-ray imaging has revolutionized modern medicine, enabling visualization of disease in nearly every organ, but cancer risks exist from associated ionizing radiation. There is therefore an ongoing need to reduce radiation doses from x-ray imaging by optimizing x-ray imaging procedures. The radiation-dose efficiency of an x-ray system, which is a measure of how efficiently x-rays are used to produce an image, is fundamentally limited by the underlying x-ray detector technology. Recent advances in x-ray detector technology have led to x-ray detectors capable of estimating the energy of individual x-ray photons at rates adequate for many x-ray imaging applications. This is an entirely different approach to x-ray detection than that used in clinically-available systems and has the potential to enable new low-dose x-ray imaging methods. However, there are a number of factors that are expected to degrade the quality of medical images produced using this technology. A common approach to describing the performance of x-ray imaging detectors involves the use of well-established metrics of imaging performance. Theoretical analysis of these metrics has proven useful in understanding the performance of imaging systems that use conventional x-ray detector technology. Such a theoretical formalism for understanding the factors governing the performance of next-generation spectroscopic x-ray systems would provide a framework for system optimization, and would enable establishing performance benchmarks for comparison with experimental data. We have developed new theoretical methods for modelling the imaging performance of next-generation spectroscopic x-ray imaging detectors. Our theoretical model accounts for the fundamental physical and statistical processes governing x-ray interactions in x-ray imaging detectors. We have applied our model to a variety of medical imaging applications to identify how the image quality of novel spectroscopic x-ray imaging detectors will compare with existing approaches. The results of this research will enable identifying the applications where this exciting new technology is expected to improve medical image quality, which will ultimately enable targeted investments of valuable research resources.

Modelling x-ray system performance in mammography

EME 1121; 11 - 11:20

Student: Robert LALONDE

Supervisor: Jesse Tanguay

Regular mammographic x-ray screening in women over the age of 40 has been shown to reduce breast cancer mortality by 30-50%. Despite the potential benefits of mammographic screening, current practices have limitations. Distinguishing malignant tumours from benign tumours can be difficult, which can result in the false detection of breast cancer. This will lead to an unnecessary biopsy, which is not only an unpleasant experience for a patient to undergo, but also costly. One of the major factors inhibiting tumour visualization in mammography is the background anatomic structure, or surrounding healthy tissue, referred to as anatomic noise. Anatomic noise creates visual clutter in the x-ray image, making tumour detection difficult. New types of mammographic imaging techniques may be able to suppress anatomic noise. To know whether these new techniques truly have the potential to improve image quality, one could, for example, perform a human-observer detection experiment. Such experiments can be costly and, in many cases, not feasible. Often it can be useful instead to use mathematical modelling to assess system performance. Currently, the only way of gaining insight into anatomic noise is through empirical measurement, which inhibits full theoretical modelling of system performance. Full theoretical modelling would be useful for the design and optimization of new x-ray imaging systems. One could observe the effect that changing system parameters would have on image quality prior to constructing a prototype. In this study, a newly developed technique for theoretically modelling anatomic noise was validated. Experiments were performed to measure anatomic noise in a structured breast phantom and the results were compared to theoretical predictions. This new technique will aid future development of x-ray imaging systems by providing imaging scientists the tools needed to model x-ray system performance. This will help determine whether new mammographic techniques will be able to improve cancer diagnosis.

Efficiency of Shear Driven Flow in Power-Law Fluids

EME 1121; 11:20 - 11:40

Student: Sean COLFORD

Supervisor: Murray Neuman

Some non-Newtonian fluids exhibit a power-law (nonlinear) relationship between shear stress and shear rate. Prior work in the lab has shown, via numerical simulations, that such fluids can be induced to flow through a round tube by the shear forces generated by longitudinal oscillations of the tube wall, without the application of a pressure difference between the ends of the tube. The rate of this "shear-driven flow" can have a positive time-average value, even though the time-average displacement of the oscillating tube wall is zero. The velocity cycle of the tube wall must be asymmetric to achieve a positive net flow. Past studies have modeled this flow in an infinitely long straight tube, conditions that cannot be replicated experimentally. However, these simulations are also mathematically applicable to the flow in a tube formed into a closed circular loop and undergoing torsional (rather than longitudinal) oscillations around an axis through the centre of the loop. This geometry is easily achieved experimentally. We constructed an apparatus with this geometry to produce asymmetric torsional oscillations, and measured the shear-driven flow of dilute solutions of xanthan gum in water. These solutions are known to be non-Newtonian; their viscosities were measured in the course of this work. With the viscosities known, the flow-rate measurements could be compared quantitatively to simulations.

Thin Matter Shell Collapse in a Vaidya-Vaidya Exterior Black Hole

EME 1121; 11:40 - 12

Student: Stephanie GALATA
Supervisor: Ben Tippett
The universe is a vast and mysterious place. Although within the past few centuries we have been able to solve many of these mysteries, there are many that remain. Amongst the many questions that are asked amidst the Astronomy community is, how are supermassive black holes formed. This research seeks to help in the efforts to unravel this mystery. To gain a deep understanding of thin shell collapse models using the Israel Junction Conditions, we first conducted a thorough literature review from various previous studies. Satisfied with the intricacies of such methods, we then moved on to the analytic modelling of radiating matter collapsing into a black hole. By identifying time like, inwards moving, spherically symmetric shells with interior and exterior Vaidya geometries we could apply the Israel Junction Conditions to our setup. These conditions led to an equation of motion specifying the evolution of the collapsing shell. We constructed a MAPLE numerical code to be able to extract useful information about the collapse process from the equation of motion. Our analysis of the results revealed that as the shell collapses it loses mass corresponding to the outgoing radiation. It was also seen that a requirement for collapse is that during the evolution of the shell, the pressure decreases and becomes increasingly negative. In this talk I will highlight, in detail, the steps that we took to reach these conclusions.

Lay Perceptions of Non-Offending Pedophilia
EME 1121; 12:40 - 1
Student: Aravis WALTERS
Supervisor: Jan Cioe
With the moral panic surrounding child sexual abuse, it is no surprise that sexual attraction to children is often conflated with sexual abuse by the general public. However, research shows that some individuals experience a pedophilic attraction their whole life but express a strong desire to refrain from making any sexual contact on moral grounds. These people often report experiencing fear of disclosing their attraction to others for fear of being stigmatized. As a result, many experience various mental health issues. Making support more available to this population is essential in helping them cope, but this is difficult without understanding how this would be viewed by the public. Thus, it is important to explore public stigma towards non-offending pedophiles. To this end, this study seeks to explore laypeople's attitudes towards non-offending pedophiles as compared to different types of offenders, as well as various factors that may influence these perceptions.

Sexual Victimization in Men and Women
EME 1121; 1 - 1:20
Student: Larissa JUST
Supervisor: Jan Cioe
Sexual coercion is currently a very prevalent issue in today's society, and can be defined as the act of using pressure, drugs or alcohol, or force in order to obtain sexual contact with someone against their will (Struckman-Johnson, Struckman-Johnson, & Anderson, 2003). From this, there are a few mitigating factors that may influence a person's susceptibility to sexual coercion. Assertiveness, level of risk-taking behaviour, and ethnicity have all been found to influence sexual coercion in women. However, their impact on men has been neglected in the literature. This study aims to add to the literature on men in regards to sexual victimization, specifically how they are influenced by assertiveness, risk-taking tendencies, and ethnicity, while also looking at what has already been found in regards to women.

Paraphilia's and the Dark Triad: An Examination of Dark Personalities Sexual Interests and Behaviours
EME 1121; 1:20 - 1:40
Student: Alissa YARGEAU
Supervisor: Jan Cioe
Research has shown that the Dark Triad traits (Psychopathy, narcissism, and Machiavellianism) have been linked to increased levels of crime. There has been limited research however, focusing these traits and sexual crime specifically. The present study sought to explore the relationship between the Dark Triad traits and their sexual interests as well as behaviours in regards to different paraphilia's. The paraphilia's analyzed in this study included; pedophilia, voyeurism, masochism, sadism, exhibitionism, fetishism, and frotteurism. Canonical Correlation analysis was utilized to study this relationship, there were significant differences found between the three Dark Triad traits in regards to their sexual desires. The findings from this study will provide insights into the desires and motivations of individuals with dark personality traits that could be a danger to others in society.

Reframing Happiness: Can you Picture it?
EME 1121; 1:40 - 2
Student: Audra DAVIS
Supervisor: Lesley Lutes Derrick Wirtz
The present study is an online behavioural intervention designed to compare methods for increasing happiness and well-being within an undergraduate population. This was done by teaching participants how to reframe everyday negative automatic thoughts. Participants were instructed through a lesson and were given the opportunity to practice reframing before using those techniques for 5 consecutive days. Participants were randomly assigned to a 7-part, 5-day program of either a traditional pen-and-paper journal or an experimental photo journal, with the hypothesis being that participants may report greater levels of happiness in the interactive photo journal condition when compared to the pen-and-paper group. It was also hypothesised that both conditions will report greater levels of happiness by just participating in the intervention. In both study conditions, participants were asked to make note of one or more naturally occurring negative thoughts each day and to reframe them; however, in the photo journal condition participants were asked to simply take a photo that would be used as an aid to remind them of their reframed negative thought when they completed the day's survey, which also included measures of their happiness and well-being. This study aims to have 60 participants complete the intervention, with having 30 participants per condition.

Computerized Street Crossing Exercise for Neglect Patients
EME 1121; 2:20 - 2:40
Student: Jessica HANSEN
Supervisor: Maya Libben
Hemispatial neglect is a phenomenon that occurs following a stroke and causes patients to ignore the left side of space. This can lead to a number of problems for patients including heightened risk for falls and accidents. In this study, patients will participate in a computerized street crossing exercise with the goal of helping neglect patients increase their awareness to their contralateral side and improve safe street crossing behaviours. In addition, we will analyze their eye-tracking movement in order to assess the specific attentional patterns that underlie neglect patients' impairment and potential improvement over time in this task. It is expected that repeated trials would reduce the number of virtual "accidents" that neglect patients experience, as well as improve attention to the

neglected side. Our methods include patients undergoing a neuropsychological evaluation, four additional tasks, and the street crossing exercise. Although virtual reality or computerized tasks are one of the most promising treatments for neglect, they are also the newest; therefore, the reliability, validity, and efficacy of these treatments are still largely unknown. In addition, the specific factors (i.e. eye movements and attentional patterns) underlying observed improvements in patients are unclear. However, the findings have the potential to improve rehabilitative treatment planning for neglect patients in the future.

Validation of the Translated Negative Physical Self Scale

EME 1121; 2:40 - 3

Student: May LY

Supervisor: Maya Libben

As modern society becomes increasingly multicultural, it is necessary to have the tools and resources available to accommodate the needs of a diverse population. Individuals from different cultures may experience eating disorders and their related constructs, such as body dissatisfaction, differently depending on the sociocultural influences from their respective cultures. The purpose of the current study was to assess the psychometric and generalizability properties of an English translation of the Negative Physical Self Scale (NPSS; Chen, Jackson, & Huang, 2006) to a North American sample. The NPSS was originally constructed to measure body image disturbance and general dissatisfaction with physical appearance among adolescents and adults in China. The scale was developed in Chinese and, at present, there is no formal English adaptation of the NPSS for use with a North American population. Female participants (n = 500) between the ages of 18-25 completed an online self-report survey consisting of the NPSS and two other established measures, the Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairbum, 1987) and the Eating Disorders Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 2008). The psychometric properties of the NPSS were concurrently tested with that of the BSQ and EDE-Q. Analyses are in progress and results will be discussed.

Finding the Fakers: Use of Eye Tracking during the Wisconsin Card Sorting Test as an Intrinsic Test of Effort

EME 1121; 3 - 3:20

Student: Leah SORGE

Supervisor: Maya Libben

Neuropsychological assessment is the performance-based evaluation of cognitive function. Neuropsychological tests target primary areas of cognition including memory, executive function, processing speed, language and learning. During assessment, it is recommended that neuropsychologists incorporate measures of effort into their neuropsychological battery, due to the threat of malingering invalidating test scores (Bush et al., 2005). The current study aims to determine if pupil dilation can be used as an intrinsic test of effort on the computerized version of the most common test of executive function, the Wisconsin Card Sorting Test (cWCST; Psychological Assessment Resources [PAR], 2007). Previous research has shown that pupil size increases when the amount of cognitive load is increased (Goldberg & Wichansky, 2003; Kahneman & Beatty, 1966) and therefore may serve as an objective measure of effort during neuropsychological testing. Participants (UBCO students recruited from SONA) were asked to either try their best, or to purposefully mangle (fake bad), while completing the cWCST. We predicted that the Best Effort group would show increased pupil dilation as compared to the Faking Bad group, particularly at the beginning of each new problem set. As the Best Effort group discovered how to match the cards in each set, we expected pupil size to decrease, secondary to decreased cognitive effort. We predicted that the Faking Bad group would have had relatively constant pupil size across trials, as they will not be expending the effort required to solve the sets. Results will be discussed in the context of the neuropsychological malingering literature.

Investigating the Dream Content of Dark Personalities

EME 1121; 3:20 - 3:40

Student: Chelsea TINGLEY-WEISGERBER

Supervisor: Michael Woodworth

The content of a dream is related to the waking preoccupations of the dreamer and thus reflects important psychological differences between individuals (Kramer & Glucksman, 2015). As such, examining the content of a dream can provide useful information to understand the mindset of someone during his or her waking hours. Research suggests that individuals who share certain personality traits dream about similar things. However, literature in this area has not yet studied the relationship between dream content and “dark” personality traits, specifically narcissism, Machiavellianism, and psychopathy, which compose the Dark Triad (DT). The present study investigated the prevalence profile and frequencies of typical dream themes among 289 Canadian university students. Using the Typical Dreams Questionnaire (TDQ), as well as a detailed written description of participants’ most recent dreams, the present study sought to distinguish the typical dream themes of individuals who score high on the DT personality measures from those with low DT scores. The main purpose was to determine whether dream personality differences (i.e., high DT scorers vs. low DT scorers) are consistent with differences in waking life, in accordance with the continuity hypothesis. It is expected that dream content will reflect the personality characteristics of individuals to some extent. For example, individuals who score high on narcissism will dream about power and success, thereby supporting the continuity hypothesis. However, being the first of its kind, this study was primarily exploratory in nature. This preliminary investigation will lay the foundation for future research in this area, ideally with at-risk or forensic populations.