INTERDISCIPLINARY SERIES FOR PROFESSIONAL INTELLECTUAL AND RESEARCH ENGAGEMENT

INSPIRE

2023

RESEARCH SYMPOSIUM

ABSTRACTS

“If you have knowledge, let others light their candles in it.” - Margaret Fuller

American journalist, editor, critic, translator, women's rights advocate, and first American female war correspondent. Her book “Woman in the Nineteenth Century” is considered the first major feminist work in the US.

Howe, D. (2021) *Margaret Fuller*, The Stanford Encyclopedia of Philosophy, Zalta E. N. (ed.), https://plato.stanford.edu/archives/sum2021/entries/fuller-margaret/

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INSPIRE

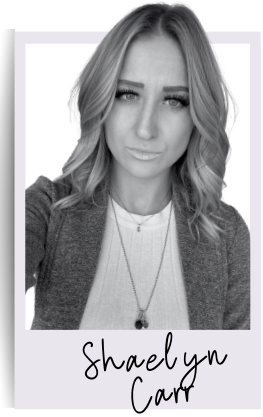
Hello and welcome to the first INSPIRE Research Symposium! We are *so* excited to bring this opportunity to the University of Regina. INSPIRE is an interdisciplinary graduate initiative which is led by a team of graduate students. INSPIRE strives to promote academic success and professional development among graduate students, as well as the greater student body.

The main goal of the INSPIRE Research Symposium is to function like an academic conference. This way, students can gain exposure to an academic conference setting, but within a friendly and encouraging atmosphere.

We want to thank everyone for engaging in this symposium and wish everyone continued success in their academic journey.

Best wishes,
The INSPIRE Team

MEET OUR TEAM



Shaelyn is a first-year Ph.D. student in Experimental and Applied Psychology and completed her Master's degree at the University of Regina in 2023. She graduated from the University of Calgary with an honours in a Bachelor of Science in Psychology and a minor in Sociology. Shaelyn's Master's thesis focused on a novel eyewitness lineup technique to use with children and the results are promising for continued research on the technique. Her research interests include the memory and accuracy of eyewitnesses, both children and adults, lawyer interviewing with children, and police interview techniques with children. As a co-founder of INSPIRE, Shae is passionate about student success and students sharing skills with one another to support each other.

Andy is a PhD student in the clinical psychology program at the University of Regina. As a mixed-method researcher, his interests span across topics of aging and chronic illness (e.g., dementia, cancer). Some of his recent work has explored the effect of mind-body therapies for cancer survivors, and the assessment of pain in older adults with severe dementia.
As a co-founder of INSPIRE, Andy is passionate about student engagement and interdisciplinary collaboration. He hopes to help create pathways for students to work together and learn from one another in their academic and professional pursuits.

Priya Verma

Priya is a second year MSc Interdisciplinary student in Kinesiology & Health Studies and Biology. Her research explores the relationships between aging and gut microbial composition in fit older adults, providing information for targeted interventions to improve healthy aging. Her work is co-supervised by Dr. Julia Totosy de Zepetnek and Dr. Andrew Cameron. She assists in both CAMEROlabs and IMSS, performing research on the cardiometabolic health of individuals with type 2 diabetes and cystic fibrosis, as well as microbial genomics. She is excited to be part of INSPIRE and help promote interdisciplinary collaboration.

Hamza Zouaghi

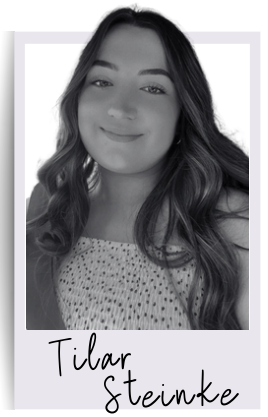
Hamza is a second-year Master's student in Industrial Systems Engineering, with expertise in Deep learning focusing on Generative Adversarial Networks (GANs). His innovative research aims to transform static images into dynamic videos using drag flow vectors, a cutting-edge approach in the field of visual data synthesis. Under the guidance of Dr. Wei Peng, he is honing his expertise in this niche of artificial intelligence. He utilizes his event management skills to foster connections between the Faculty of Graduate Studies FGSR and the INSPIRE group, enhancing the event execution and organization through his role as a dynamic intermediator.

Joshua Adams

Josh Is a second-year master's student in the faculty of biochemistry and chemistry. His research is focused on studying bacterial antibiotic susceptibility under conditions that more accurately reflect the environment bacteria encounter upon infection. By doing so, we may un-cover unexplained failure of current therapeutics and the elucidation of the mechanisms involved could provide novel drug targets; this work is supervised by Dr. El-Halfawy. Josh joined INSPIRE because he believes in the importance of bridging multiple disciplines and he wants to support all areas of research.

Alexandra is a visual artist currently pursuing an MA in Interdisciplinary Studies. Her research explores the intersections of psychology, anthropology, and visual art, focusing on topics such as "Evil unframed", "Cultures on display", and "When perceiving is creating". Her work is supervised by Dr. Katherine Robinson and Charisma Thomson (PSYC, ANTH). She assists in multiple labs, as well as on an interdisciplinary collaboration exploring the experiences of Funeral Care Professionals working with MAID in Saskatchewan. She joined INSPIRE because she sees huge value in interdisciplinary research dissemination!

Tilar is a first-year student in the Master of Science in Experimental and Applied Psychology program. Her research examines the biases and stigmas held against victims of human trafficking in Saskatchewan by legal professionals and lay persons, with an emphasis on creating focused-education programs to break these stigmas. Her research is supervised by Dr. Susan Yamamoto at the Normative Ethics and Law Lab. She joined the INSPIRE team because she enjoys student leadership and mentoring!



To everyone engaging with today's event, we want to say: Thank you for your participation, we wish you the best, and enjoy the **2023 INSPIRE Research Symposium!**

A MESSAGE FROM THE DEAN OF THE FACULTY OF GRADUATE STUDIES AND RESEARCH

Graduate students play a vital role at the University of Regina (U of R), and student leadership significantly contributes to research and knowledge creation at our institution. The INSPIRE Research Symposium comes in this context where graduate student leadership and innovation create a forum for the community to share their research work in a supportive and a nurturing environment.

As the Dean of the Faculty of Graduate Studies and Research (FGSR), it gives me immense pride to see this research symposium come to fruition, and it demonstrates how student leadership at the U of R remains integral to interdisciplinary collaboration.

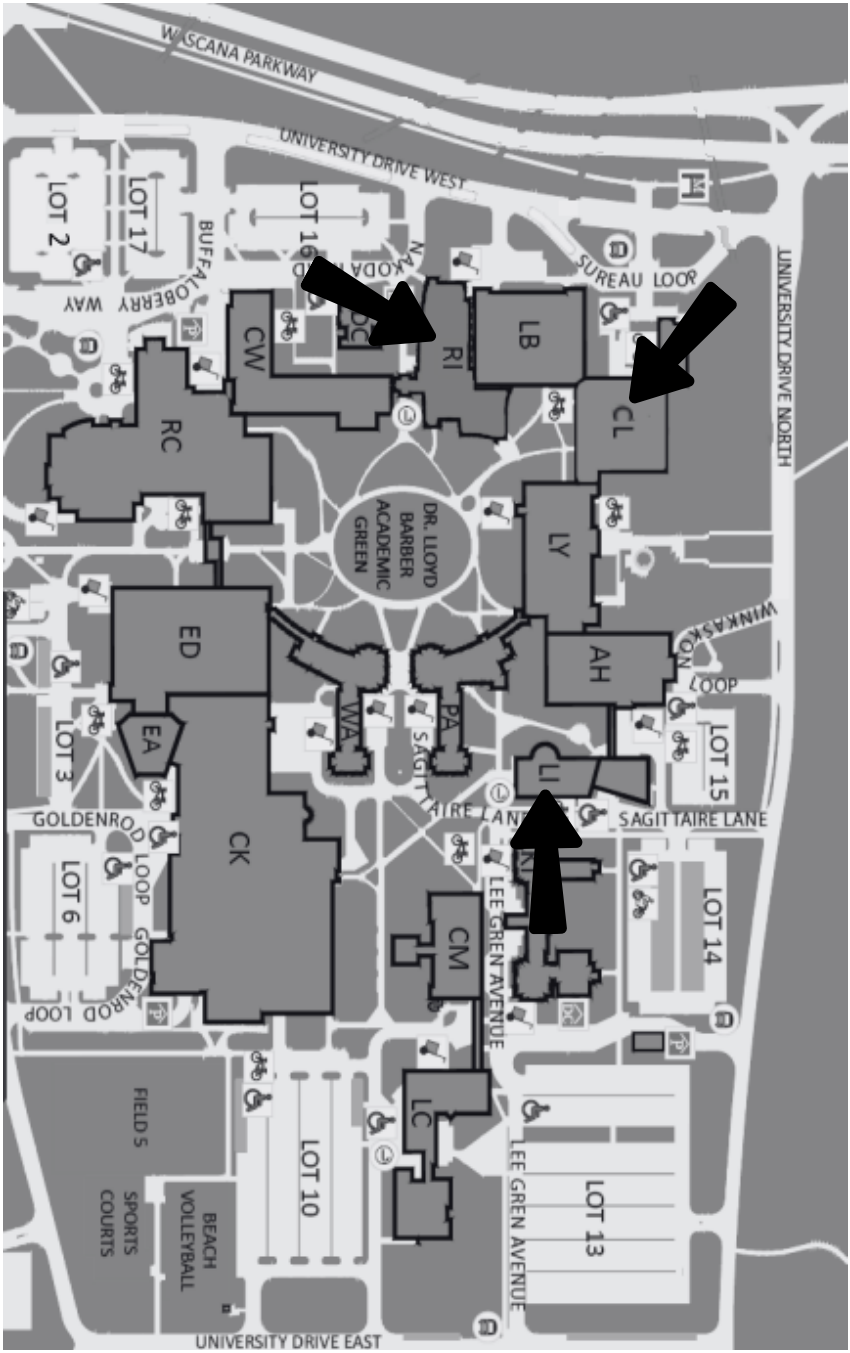
FGSR is proud to support graduate students as budding researchers and scholars in their own right, aiming to push the boundaries of knowledge and discovery across our campus.

We recognize the value these students bring as an important engine of research to our institution and province.

An event such as this, where students work together to elevate one another and learn and grow together, is a perfect showcase of the community that is our university, and helps us all move in a good way, far together.

FACULTY OF
GRADUATE STUDIES
& RESEARCH

Dr. Aziz Douai
Dean, FGSR
University of Regina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SAGITTAIRE LANE
LEE GREN AVENUE
WINKASK ON LOOP
FIELD 5
SPORTS COURTS
BEACH VOLLEYBALL

SCHEDULE

LI 215	9:00-9:15 am	***/ Introduction***
LI 215	9:15-10:15 am	***/ Paper presentations***
	10:15-10:30 am	***/ Break***
LI 215	10:30-11:30 am	***/ Data blitz***
RI	11:45-12:45 pm	***/ Poster Session & Lunch***
CL 125	1:00-1:30 pm	***/ FGSR Presentation***
CL 125	1:30-2:00 pm	***/ Keynote Address***
CL 125	2:00-3:00 pm	***/ Paper Presentations***
	3:00-3:15 pm	***/ Break***
CL 125	3:15-4:15 pm	***/ Data blitz***
CL 125	4:15-4:30 pm	***/ Closing remarks & Awards***

LOCATIONS

LI 215 = *La Cité/Language Institute*, Main Campus
RI = *Research and Innovation Centre*, Main Campus
CL 125= *Classroom Building*, Main Campus

KEYNOTE

Dr. Melanie Dennis Unrau is a SSHRC Banting Postdoctoral Fellow in the Department of Geography and Environmental Studies at the University of Regina. Melanie holds a PhD from the University of Manitoba (2019) and held a two-year SSHRC Postdoctoral Fellowship at Columbia University (2020-2021). A poet, literary scholar, editor, and parent of mixed European ancestry from Treaty 1 territory in Winnipeg, she is the author of the poetry collection Happiness Threads (Muses' Company, 2013) as well as the poetry chapbooks The Goose (above/ground, 2023) and the tracking line(s) (DIY Methods, 2023), and she is a co-editor of Seriality and Texts for Young People: The Compulsion to Repeat (Palgrave, 2014) and a special issue of Canadian Literature on "Poetics and Extraction" (2022). Melanie is a member of the British Academy/CIFAR-funded Decolonial Cities Collective, an organizer with the Manitoba Energy Justice Coalition, a former editor of The Goose

journal and Geez magazine, and a former member of the Artist Mothers collective at Mentoring Artists for Women's Art. Her forthcoming book "The Rough Poets: Petropoetics and the Tradition of Canadian Oil-Worker Poetry" is on contract with McGill-Queen's University Press. She is also working on a poetry manuscript with working title "Father Goose." Feel free to contact Melanie at melanie.unrau@uregina.ca.

THE GOOSE POETRY PROJECT

Dr. Melanie Unrau, SSHRC Banting Postdoctoral Fellow, UofR

Goose is a research-creation project that uses hand-traced visual poems to enact literary criticism of a problematic text. That text, Trails, is a collection of self-illustrated poems, short stories, and nonfiction essays published in 1938 and 1956 by S.C. Ells, a mining engineer known as "the father of the tar sands" who worked in Fort McMurray on behalf of the federal Department of Mines from 1913 to 1945. Goose begins with the playful premise that perhaps Ells liked to think of himself as a goose. It subverts and deconstructs Ells's writing in Northland Trails, making it say the things it represses and exposing its colonial and racist politics. This lecture looks back on the project as I collect the poems into a book manuscript and think through how to introduce and describe the book. I ask myself questions I have been asking throughout the project: why am I so interested in Ells? Why use poems rather than traditional scholarly formats to make arguments about Ells's writing? Is it ethical to give so much attention to a racist historical figure? What does this project contribute to Canadian literature, ecopoetics, settler colonial studies, methodologies for interdisciplinary research-creation, and broader conversations about climate change and energy transition in Canada? The talk intersperses selected poems with reflections on these questions.

THANK YOU
TO OUR POSTER JUDGES!

Dr. Alex Oehler
Associate Professor, Dept. of Anthropology, University of Regina

Dr. Raymond Deschamps
Senior Advisor to the Vice-President (Research), University of Regina

Dr. Stephen King
Senior Researcher to the President, University of Regina

SESSION ONE: PAPER PRESENTATIONS

15 / **COLIN RIEGER**
CHARACTERIZATION OF STAPHYLOCOCCUS AUREUS SUSCEPTIBILITY TO ANTIBIOTICS IN SYNTHETIC WOUND FLUID

16 / **JAY SAVALIYA**
WHAT IS THE HEALTH IMPACT OF SECONDHAND CONSUMPTION OF VAPING PRODUCTS?

17 / **ABU MOHAMMAD HAMMAD ALI**
PREFERENCE AGGREGATION USING CP-NETS

18 / **KIRSTEN BRODERICK**
DECIPHERING THE ROLE OF A PREVIOUSLY UNCHARACTERIZED MITOCHONDRIAL PROTEIN IN BIPOLAR DISORDER

19 / **PRADEEP RANJAN DOLEY BARMAN**
FROM FORESTS TO FESTIVALS - PLANT HUMAN COMPANIONSHIPS IN MISSING TRIBE OF NORTHEAST INDIA

CHARACTERIZATION OF STAPHYLOCOCCUS AUREUS SUSCEPTIBILITY TO ANTIBIOTICS IN SYNTHETIC WOUND FLUID

Colin Rieger - Biochemistry
Supervised by Dr. Omar El-Halfawy

The World Health Organization has declared antimicrobial resistance as one of the top 10 global public health threats. Chronic wound infections are commonly caused by methicillin-resistant S. aureus strain, USA300. Standard in vitro antimicrobial susceptibility testing uses Mueller Hinton broth (MHB). Here, we used synthetic wound fluid (SWF), a medium that resembles the composition of the infection site, to test the susceptibility of USA300. This work uncovers the mechanism by which USA300 is sensitized to cefuroxime and resistant to doxycycline in SWF, providing important insight into bacterial cellular responses under host-relevant conditions and potential novel drug targets.

WHAT IS THE HEALTH IMPACT OF SECONDHAND CONSUMPTION OF VAPING PRODUCTS?

Jay Savaliya - Biology
Supervised by Dr. Tzu-Chiao Chao Dr. Nicole Hansmeier

Vaping, the inhalation of e-cigarette smoke with and without nicotine and flavors, has become a common alternative to traditional cigarette smoking. However, in-depth knowledge of the long-term health impact of second-hand (passive) consumption is still lacking. In this study, we investigated the effects of chronic second-hand smoke exposure of e-liquids on rat lung health using histopathological and proteomic analyses. Proteomic analyses revealed severe inflammatory network perturbations while visual inspection of the lung tissue showed an increased numbers of foam cells, collagen depositions, hemosiderin-laden macrophages, providing strong evidence for severe tissue damage associated with long-term second-hand consumption of vaping products.

PREFERENCE AGGREGATION USING CP-NETS

Abu Mohammad Hammad Ali - Computer Science
Supervised by Dr. Sandra Zilles

Preference aggregation aims to find the best collective preference ordering given a profile of individual preference orderings. The literature often assumes the individual orderings are explicit. This is not practical for combinatorial domains, usually represented using compact models. From several such models, we focus on Conditional Preference Networks (CP-nets), for both the input and aggregate preferences. Unlike previous studies with CP-nets that focus on voting rules, we treat preference aggregation over CP-nets as an optimization problem. We propose three objective functions, and an algorithm that provably optimizes one function. We also show that any algorithm optimizing this function cannot avoid exponential aggregate output. This motivates our study of approximation algorithms constraining the output to be polynomial in input size.

DECIPHERING THE ROLE OF A PREVIOUSLY UNCHARACTERIZED MITOCHONDRIAL PROTEIN IN BIPOLAR DISORDER

Kirsten Broderick - Biochemistry
Supervised by Dr. Mohan Babu

Bipolar disorder (BD) is a neuropsychiatric disease defined by bioenergetic imbalances resulting from mitochondrial (mt) dysfunction. Large-scale genome association studies in BD patients have identified many mutations in mt genes, yet many of these proteins' functions remain unclear. Here, we have assessed the role of an uncharacterized mt protein (BDMT1) concerning BD pathophysiology using iPSC-derived cortical neurons from patients and healthy fibroblasts. It was found that BDMT1 levels were downregulated, and its protein interactions involved in energy metabolism and other mt processes were remodelled in BD patients vs healthy controls. BDMT1 knockdown impacted multiple aspects of mt health and glutamate metabolism, and these phenotypes were restored when BDMT1 was overexpressed. Our findings revealed the role of a previously uncharacterized mt protein BDMT1 in BD etiology, contributing to our knowledge of the intricate relationship between mt dysfunction and the onset of neurological disorders, which can be valuable in designing effective therapies to treat mt impairments in BD.

FROM FORESTS TO FESTIVALS- PLANT HUMAN COMPANIONSHIPS IN MISING TRIBE OF NORTHEAST INDIA

Pradeep Ranjan Doley Barman - Anthropology
Supervised by Dr. Alex Oehler

This study explores human-plant relationships in Northeast India's *Mising* tribe, while simultaneously critiquing anthropocentric worldviews. Employing posthumanist anthropology and philosophical ethology, it details the interspecies intimacies formed during the preparation of *apong*, a culturally significant rice beer. Through multispecies ethnography, this work investigates the nuanced dynamics of cooperation, communication, and dependency between humans and wild plants through all stages of brewing. It seeks to reframe nonhumans within political liberation, akin to movements for gender and racial equality, fostering a revised environmental citizenship. this research highlights Northeastern Indigenous knowledge as vital for addressing ecological crises and advancing discussions of sustainability in the Anthropocene.

SESSION TWO: DATA BLIZ

21 / **JASLEEN KAUR**
CAREGIVER MENTAL HEALTH IN CHILDHOOD CYSTIC FIBROSIS

22 / **NADIYA EKHTERAEETOUSSI**
ADDRESSING EQUITY, DIVERSITY, INCLUSION & ACCESSIBILITY CHALLENGES FOR INTERNATIONAL FEMALE STUDENTS IN CANADIAN INSTITUTIONS: STRATEGIES FOR EDUCATIONAL LEADERS

23 / **SIFAT E JAHAN**
NATURE-INSPIRED TECHNIQUES FOR COMBINATORIAL REVERSE AUCTIONS IN ELECTRICITY CONSUMPTION

24 / **ZAHRA MOSLEMI**
EXPLORING NEURAL CORRELATES OF MOTOR FUNCTION AND FITNESS IN PEOPLE LIVING WITH MULTIPLE SCLEROSIS

25 / **STEPHANIE FLAMAN**
USING UNMANNED AERIAL VEHICLE AND LIGHT DETECTION AND RANGING TECHNIQUES TO ESTIMATE SHELTERBELT BIOMASS

26 / **ALEXA DANYLUK**
THE RELATIONSHIP BETWEEN DISPOSITIONAL MINDFULNESS AND COPING FLEXIBILITY

27 / **SATYAM SINGH**
ENHANCING LOGICAL LANGUAGE MODELING WITH Z3 THEORY

28 / **HANIEH MAJD**
SHOULD INTERNATIONAL UNIVERSITY STUDENTS IN CANADA BE SUPPORTED MORE?

CAREGIVER MENTAL HEALTH IN CHILDHOOD CYSTIC FIBROSIS

Jasleen Kaur - Clinical Psychology
Supervised by Dr. Kristi Wright

Cystic Fibrosis (CF) is a life-limiting, progressive, multisystem, genetic disease that is characterized by symptoms such as respiratory problems, lung infections, and digestion difficulties. Approximately 4,300 Canadians receive a diagnosis, with a third being children. In addition to affecting child health, a childhood diagnosis of CF impacts caregiver and family wellbeing. Caregivers of children with CF often report increased mental health concerns, such as anxiety and depression. Specialized resources for this population are scarce and there are often barriers to access. This presentation aims to describe such challenges and discuss the development of an internet-delivered resource as a viable solution.

ADDRESSING EQUITY, DIVERSITY, INCLUSION & ACCESSIBILITY CHALLENGES FOR INTERNATIONAL FEMALE STUDENTS IN CANADIAN INSTITUTIONS: STRATEGIES FOR EDUCATIONAL LEADERS

Nadiya Ekhteraeetoussi - Education
Supervised by Dr. Valerie Triggs

Immigrant students face various challenges affecting their quality of life, such as economic, mental, health, academic, and even physical factors. Equity, Diversity, Inclusion, and Accessibility (EDIA) concerns are among the toughest that immigrant women confront, requiring remedial advice and action to help them overcome the issues or reduce their strain. This research will investigate and explore the potential problems that immigrant women students may experience concerning EDIA issues, in addition to taking action to eliminate shortages and raise immigrant women's awareness of their rights, roles, and services. This study aims to demonstrate the issues that immigrant women students encounter regarding the EDIA challenges, as well as the activities that especially the leaders of organizations, communities, and other involved groups can take to limit the amount of pressure or other materials. It also aims to increase diversity in its myriad forms, including race and ethnicity, gender and sexual identity, and more.

NATURE-INSPIRED TECHNIQUES FOR COMBINATORIAL REVERSE AUCTIONS IN ELECTRICITY CONSUMPTION

Sifat E Jahan - Computer Science
Supervised by Dr. Malek Mouhoub

With the growing demand for electricity, the likelihood of experiencing power outages is also rising. Utility companies have started buying electricity through e-auctions to address this issue. To meet the increasing electricity demand, a solution based on nature-inspired techniques is presented, which will procure energy from various sources, trading off multiple objectives to solve a complex winner(s) determination problem for resource procurement optimization. Genetic Algorithms (GAs) can generate feasible solutions for this NP-hard problem. Additionally, various GA techniques are explored to evaluate their effectiveness in producing high-quality solutions for several instances of the CRA problem.

EXPLORING NEURAL CORRELATES OF MOTOR FUNCTION AND FITNESS IN PEOPLE LIVING WITH MULTIPLE SCLEROSIS

Zahra Moslemi - Kinesiology and Health Studies
Supervised by Dr. Cameron Mang

Multiple sclerosis (MS) is a chronic, autoimmune, and inflammatory disease of the central nervous system that leads to physical deconditioning. We explored relationships between walking (Timed 25-foot Walk Test), balance (Mini-Balance Evaluation Systems Test), aerobic fitness ($\dot{V}O_2$-peak), lower limb corticospinal excitability (measured by transcranial magnetic stimulation), and blood biomarkers of neuronal inflammation and damage. Preliminary results suggest that lower limb corticospinal excitability and blood biomarkers of neuroinflammation may be associated with motor function and fitness in people with MS. Characterizing neural correlates of motor function and fitness may support future development of targeted MS rehabilitation strategies.

USING UNMANNED AERIAL VEHICLE AND LIGHT DETECTION AND RANGING TECHNIQUES TO ESTIMATE SHELTERBELT BIOMASS

Stephanie Flaman - Biology
Supervised by Dr. Mark Vanderwel and Dr. Fardausi Akhter

Canada has a natural climate solutions plan to reduce greenhouse gas emissions within the agricultural sector. One solution allows landowners to offset emissions by sequestering carbon in shelterbelts, which are planted rows of trees on agricultural land. There is a need for operational tools that can estimate individual shelterbelt biomass to increase shelterbelt preservation and planting and therefore, increase carbon sequestration. We plan to evaluate remote-sensing based approaches such as using aerial imagery collected by an unmanned aerial vehicle and public resolution digital elevation models derived from airborne light detection and ranging data for estimating on-farm shelterbelt biomass in Saskatchewan.

THE RELATIONSHIP BETWEEN DISPOSITIONAL MINDFULNESS AND COPING FLEXIBILITY

Alexa Danyluk - Clinical Psychology
Supervised by Dr. Shadi Beshai

Maladaptive responses to life stressors can result in a range of mental health issues, but the ability to deploy varying coping strategies specific to a stressor (coping flexibility) may protect against these effects. While predictors of coping flexibility are under-researched, preliminary findings support a link between mindfulness and coping flexibility in students. This study will extend previous research by employing a community sample to explore the relationship between mindfulness and coping flexibility, clarifying the relationship between these variables. Notably, findings may support future research on the utility of mindfulness-based interventions to promote coping flexibility and reduce symptoms of psychological distress.

ENHANCING LOGICAL LANGUAGE MODELING WITH Z3 THEORY

Satyam Singh - Computer Science
Independent Researcher

This paper explores the integration of Z3 theory to bolster Logical Language Modeling (LLM) for improved comprehension of human language. LLM often struggles with nuanced language, leading to suboptimal responses. Employing Z3 theory facilitates the translation of ambiguous inputs into machine-readable language, empowering LLM to autonomously reason. The study delves into the advantages, applications, and limitations of this approach, shedding light on its potential to enhance the precision and interpretability of LLM in various contexts.

SHOULD INTERNATIONAL UNIVERSITY STUDENTS IN CANADA BE SUPPORTED MORE?

Hanieh Majd - Education
Supervised by Dr. Michael Cappello

As the number of international students tends to increase all around the world, this study aims at understanding the challenges that international graduate students encounter while studying in a university in Canada. The focus of their challenges is mainly on the difficulties they may have in "class discussions". To this end, 6 International students majoring in Education at the University of Regina are selected to be interviewed one-on-one to share their learning experience and their expectations or solutions. Their difficulties are assumed not only to be attributed to their linguistic deficiencies, but also to their cultural and social differences.

POSTER PRESENTATIONS

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Psychology

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THE ASSOCIATIONS OF DISPOSITIONAL MINDFULNESS WITH RECOGNITION OF PSYCHOLOGICAL DISORDERS AND WILLINGNESS TO SEEK HELP

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EXISTENTIAL THERAPY FOR TREATING CHRONIC PAIN:A SCOPING REVIEW

35 / **BRIANA DE ROO**
ADVERSITY & RESILIENCE AMONG MIDDLE-AGE AND OLDER ADULTS LIVING WITH CHRONIC PAIN

36 / **KELSY DABEK**
MIND THE GAP: USING INFOGRAPHICS TO BRIDGE MISCONCEPTIONS SURROUNDING A NEURODEVELOPMENTAL DISORDER

37 / **VENEZYA THORSTEINSON**
THE RELATIONSHIP BETWEEN MIGRAINES AND MENTAL HEALTH IN WOMEN

38 / **NATALIE HAMM**
ARE CHILDREN ABLE TO DETECT GROOMING?

39 / **KATHERINE ENGEL**
ADULT'S PERCEPTIONS OF CHILD EYEWITNESS CREDIBILITY: MULTIPLE INDEPENDENT LINEUPS

40 / **JRAKE DORMUTH**
INDIRECT FREEDOM RESTORATIVE BEHAVIOR AS A RESPONSE TO COVID-19 INFORMATION POST LOCKDOWN

International Studies

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THE INTERLOCKING DISADVANTAGE OF MEXICAN AND CENTRAL AMERICAN WOMEN IN TIJUANA

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THE BLOOD WE WEAR: SYSTEMS OF EXPLOITATION IN THE GARMENT INDUSTRY

Media, Arts & Performance

43 / **LINS DEMCHUK**
GROWING PAINS: REGINA, SASKATCHEWAN'S OUTDOOR SCULPTURES AND THE CHALLENGES THAT FACE PUBLIC ART

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EFFECTS OF AN ACUTE NUTRIENT LOAD ON BLOOD GLUCOSE AND SUBJECTIVE APPETITE IN PERSONS WITH TYPE 2 DIABETES

45 / **ELISE MELANSON**
DIVISIONS, SYMBOLS, INTERACTIONS AND IDENTITY: THE GENDERING OF STRENGTH-BASED FITNESS SPACES

Engineering & Applied Science

46 / **RUMPA CHOWDHURY**
CANADA'S CLIMATE CANVAS: PAINTING A SUSTAINABLE FUTURE

Science

Biochemistry

47 / **VEDANT PATEL**
POLYAMINES-MEDIATED ALTERED RESISTANCE IN GRAM-NEGATIVE BACTERIA

48 / **TYLER HAMELIN**
ALTERATION OF STAPHYLOCOCCUS AUREUS ANTIMICROBIAL RESISTANCE IN CYSTIC FIBROSIS-MIMETIC CONDITIONS

49 / **TAYLOR DZIKOWSKI**
EFFECTS OF AN ACUTE NUTRIENT LOAD ON BLOOD GLUCOSE AND SUBJECTIVE APPETITE IN PERSONS WITH TYPE 2 DIABETES

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Computer Science

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SOLVING THE ELECTRICITY TECHNICIAN DISPATCH PROBLEM

Physics

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55 / **SIOBHAN CUNNINGHAM**
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56 / **YULIYA SHTYMBURSKA**
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57 / **MOHAMMED QURAISHI**
WHAT'S IN THE GENOME: USING COMPARATIVE GENOMICS TO DETERMINE THE GENETIC HISTORY OF PANTOEA AGGLOMERANS

THE ASSOCIATIONS OF DISPOSITIONAL MINDFULNESS WITH RECOGNITION OF PSYCHOLOGICAL DISORDERS AND WILLINGNESS TO SEEK HELP

Matea Gerbeza - Psychology
Supervised by Dr. Shadi Beshai

Psychological disorder symptoms impact a large portion of the Canadian population, and while effective treatments are available, few people seek them out. This can be partly attributed to low mental health literacy (MHL): lack of knowledge about where to seek help or poor recognition of psychological disorder symptoms. Dispositional mindfulness (DM) is the capacity to pay non-judgmental attention to present-moment experiences. This suggests higher DM may increase MHL. A total of n = 299 were recruited and completed measures of depression, anxiety, DM, mental help seeking attitudes, and read eight vignettes of psychological disorder symptoms. If an intervention effectively cultivates mindfulness, it may also enhance aspects of MHL.

EXISTENTIAL THERAPY FOR TREATING CHRONIC PAIN: A SCOPING REVIEW

Amara Kohlert - Psychology
Supervised by Dr. Natasha Gallant

This scoping review aims to identify the characteristics, themes, and results of existential therapy for treating chronic pain. In May 2023, we searched seven databases for papers describing an existentially based intervention for a chronic pain sample. Six articles met the criteria. All studies reported an easing of pain symptoms or severity. Physical functioning was uninfluenced by existential-spiritual therapy alone but improved when existential therapy combined with other therapies. Meaningfulness was a common theme in interventions and outcomes. Spirituality moderates the effectiveness of existential therapy. Findings offer an overview of the current knowledge of existential therapies for chronic pain treatment.

ADVERSITY & RESILIENCE AMONG MIDDLE-AGE AND OLDER ADULTS LIVING WITH CHRONIC PAIN

Briana De Roo - Psychology
Supervised by Dr. Natasha Gallant

Chronic pain is a common experience in middle-age and older adults. Research finds that adversity in childhood is associated with chronic pain later in life. Resilience may be a protective factor against pain-related outcomes. To look at these factors in middle-age and older adults, a cross-sectional survey was conducted that investigated pain, adversity, and resilience. Bivariate correlations revealed no significant differences between pain related-factors, adversity, or resilience. These results may be due to a small sample size, as it is contrary to existing literature in other age groups. Future studies should explore coping strategies and emotional regulation in chronic pain.

MIND THE GAP: USING INFOGRAPHICS TO BRIDGE MISCONCEPTIONS SURROUNDING A NEURODEVELOPMENTAL DISORDER

Kelsy Dabek - Psychology
Supervised by Dr. Donald Sharpe

Misconceptions around Attention Deficit Hyperactivity Disorder (ADHD) are widely held. The research objective was to determine if misconceptions may be reduced through correct information presentation with infographics. Infographics are a popular method to display information in a simple-to-process manner. Ninety-nine undergraduates from the UoR were randomly assigned to groups receiving an infographic, a text-only paragraph, or control. Participants completed a quiz assessing knowledge and perceptions of ADHD. Infographic participants scored higher on the quiz compared to control participants, text-only participants fell in-between. Results suggest discrepancy between ADHD public perceptions, and that infographics may be a stronger method at countering misinformation.

THE RELATIONSHIP BETWEEN MIGRAINES AND MENTAL HEALTH IN WOMEN

Venezya Thorsteinson - Psychology
Supervised by Dr. Natasha Gallant

Aim: The aim of the proposed study is to gain a better understanding of the relationship between migraines and mental health outcomes among women. Methods: Recruitment of participants involved advertisements of the study on the University of Regina's Psychology Participant Pool. Participants included individuals who were at least 18 years of age and identified as women. Both participants who do and do not experience migraines were included. Participants who experience migraines were asked to complete both a migraine characteristics and a migraine disability questionnaire. All participants were asked to complete a set of online questionnaires on depression, anxiety, trauma, and discrimination.

ARE CHILDREN ABLE TO DETECT GROOMING?

Natalie Hamm - Psychology
Supervised by Dr. Kaila Bruer

The proposed research examines whether children are able to perceive adults' grooming tactics. Child participants (N=541) will read two stories about a child-adult interaction. The child in each story is asked to either go to a private or public place with the teacher and return or not return from the secondary setting. After reading the story, children will be asked questions about how they felt, what they saw wrong, and what they would do. This research will provide information to help us better understand how children perceive grooming tactics in adults and if they deem these behaviours as inappropriate.

ADULT'S PERCEPTIONS OF CHILD EYEWITNESS CREDIBILITY: MULTIPLE INDEPENDENT LINEUPS

Katherine Engel - Psychology
Supervised by Dr. Kaila Bruer and Shaelynn Carr

Eyewitness testimony is a powerful piece of evidence in criminal cases (O'Neill et al., 2011), but this is problematic as eyewitness testimony is a leading cause of wrongful convictions (Innocence Project, 2023). Mistaken eyewitness testimony is prominent in children, who identify innocent suspects more frequently than adults (Fitzgerald & Price, 2015). Age-appropriate lineup techniques have been explored to assess child eyewitness accuracy, such as the multiple independent lineups technique (MILs), which found promising results with children (Carr & Bruer, 2023). This study will extend this research to explore how adults perceive child eyewitness identifications on the MILs.

INDIRECT FREEDOM RESTORATIVE BEHAVIOR AS A RESPONSE TO COVID-19 INFORMATION POST LOCKDOWN

Jrake Dormuth - Psychology
Supervised by Dr. Donald Sharpe

State reactance is the process of defying a source of restriction and this entails behaviour that is motivated to restore personal freedom. This study assessed if students from the University of Regina Participant Pool would negatively react to COVID-19 information and report behaving in ways that indirectly restored their perceived freedom. Those who were placed in a low threat video condition and reported less negative thoughts, reported significantly lower denial behaviour than those with high negative thoughts. Reactance can also be understood as a personality trait and it was found to be positively associated with state reactance and negatively with agreeableness.

THE INTERLOCKING DISADVANTAGE OF MEXICAN AND CENTRAL AMERICAN WOMEN IN TIJUANA

Paola Alvarez - International Studies
Supervised by Dr. María de Lourdes Rosas López, UPAEP, Mexico

The purpose of the presentation is to show the situation of Central American and Mexican migrant women who live in the “Don Bosco” shelter in the border city of Tijuana. The information was collected through in-person interviews. The identified characteristics were: living in fear, support from shelters to preserve their health during critical months of the COVID-19 pandemic, facing difficulties when trying to exercise motherhood with their children whom they migrated with, frustration due to unemployment, and relationships with security agents in Mexico. Additionally, this research aims to show the economic impact of the pandemic by demonstrating how it impoverished the women’s families in their places of origin and forced people to migrate from sectors that do not usually move.

THE BLOOD WE WEAR: SYSTEMS OF EXPLOITATION IN THE GARMENT INDUSTRY

Emily Janisch - International Studies
Supervised by Dr. Brian McQuinn

From individual handmade clothes to mass-produced fashion in faraway countries, the processes of clothing production have changed, yet the problems surrounding worker exploitation within the industry have not. Corporations outsourcing labour production to the developing world paired with poor government and factory policies is resulting in poor working conditions, inadequate pay, and abuse of workers. To explore these systems of exploitation, the garment industry in Bangladesh and Cambodia will be explored. This will allow for the comparison of conditions contributing to exploitation and a look into what may prevent it such as unionization.

GROWING PAINS: REGINA, SASKATCHEWAN'S OUTDOOR SCULPTURES AND THE CHALLENGES THAT FACE PUBLIC ART

Lindsay Demchuk - Art History
Supervised by Dr. Karla McManus and Dr. Sherry Farrell-Racette

Sculptures, especially those in highly outdoor visible areas, inspire discourse around the value of public art and what it should achieve. An outdoor sculpture imposes upon the visual field, becoming part of the regional visual identity. But time wears down these works, both physically and contextually. Through an exploration of three outdoor sculptures in Regina (Ted Godwin's Weather Tower, Joe Fafard's *oskana kâ-asastêki*, and Paul Raff's *Gateway*), my research explores what makes public art successful at a regional, civic, and community level.

EFFECTS OF AN ACUTE NUTRIENT LOAD ON BLOOD GLUCOSE AND SUBJECTIVE APPETITE IN PERSONS WITH TYPE 2 DIABETES

Raha Nafisi - Kinesiology and Health Studies
Supervised by Dr. Julia Totosy de Zepetnek

Glucostatic theory suggests increased blood glucose leads to decreased appetite; further, regular physical activity is associated with more sensitive appetite control. It is not clear if these same relationships are present in type 2 diabetes (T2D). The aims of the present study are: (1) investigate blood glucose and subjective average appetite (AA) following a Mixed Meal Tolerance Test (MMTT), and (2) assess the impact of adherence to 12-weeks of exercise on blood glucose and AA following an MMTT, in persons with T2D. Baseline data from 20 participants showed no glucose-AA relationship, indicating disrupted appetite regulation. Nine individuals returned after 12-weeks of exercise; results showed no main effects or interaction for glucose or AA. Further appetite regulatory hormones will be explored (e.g., insulin, ghrelin, GLP-1).

DIVISIONS, SYMBOLS, INTERACTIONS AND IDENTITY: THE GENDERING OF STRENGTH-BASED FITNESS SPACES

Elise Melanson - Kinesiology and Health Studies
Supervised by Dr. Larena Hoeber

Strength-based spaces (i.e., gyms) have historically been masculine institutions dominated by the perceptions and presence of men. Despite feminist movements bringing women into gyms, the gendered nature of the spaces, its activities and their physical outcomes have been shown to contribute to women's limited involvement in strength-based spaces. This presentation showcases women's gendered experiences within strength-based areas of gyms, focusing on the development and manifestation of the gendered culture of the space. Informed by a case study design utilizing focus groups and one-on-one interviews, we examined the gendered experiences of 18 women between the ages of 20 and 65 with varying levels of experience in fitness spaces.

CANADA'S CLIMATE CANVAS: PAINTING A SUSTAINABLE FUTURE

Rumpa Chowdhury - Environmental Systems Engineering
Supervised by Dr. Kelvin Tsun Wai Ng

Canada, a substantial contributor to carbon emissions, confronts the challenges of climate change through a multifaceted approach. It includes employing carbon pricing, investing in renewable energy, aiding indigenous initiatives, and aligning with global environmental models, which extends the focus to rural electrification, green building standards, and community-based adaptation in Canada. Allied with Sustainable Development Goal 13, Canada accentuates carbon pricing and renewable energy, contributing to SDGs 14 and 15 through conservation efforts. Some of the notable accomplishments involve land and coastal conservation, encouraging zero-emission vehicles, and reducing greenhouse gas emissions. Canada exhibits unwavering devotion by integrating policies, innovation, and collective action toward building a resilient and eco-friendly future.

POLYAMINES-MEDIATED ALTERED RESISTANCE IN GRAM-NEGATIVE BACTERIA

Vedant Patel - Biochemistry
Supervised by Dr. Omar El-Halfawy

Antimicrobial resistance is an emerging global burden due bacteria's intrinsic ability to develop resistance to antbiotics. Polyamines are vital for most living organisms, and it has been previously shown that bacteria upregulate polyamine synthesis in response to antibiotic stress. The goal of this study is to determine the signalling cascade that induces polyamine biosynthesis in response to antimicrobial stress and how exogenous polyamines impact bacterial susceptibility to antibiotics. With the antimicrobial susceptibility testing, I determined that the loss of polyamine biosynthetic genes *speB* and *speF* in Gram-negatives have increased susceptibility to antibiotics, and exogenous polyamines increase antibiotic tolerance in Gram-negative bacteria.

ALTERATION OF STAPHYLOCOCCUS AUREUS ANTIMICROBIAL RESISTANCE IN CYSTIC FIBROSIS-MIMETIC CONDITIONS

Tyler Hamelin - Biochemistry
Supervised by Dr. Omar El-Halfawy

Cystic fibrosis (CF) is a prevalent genetic condition in Canada, causing mucus buildup in the lungs, leaving patients susceptible to bacterial infections. Treatments for these infections often fail as they do not consider the environment at the site of infection. In my research, I tested antibiotics against the common CF pathogen *Staphylococcus aureus*, discovering that cefuroxime is more effective under CF-mimetic conditions. Using a chemogenomic screen, I identified genetic determinants for this enhanced effectiveness. This work sheds light on alterations in *S. aureus* antimicrobial susceptibility under host relevant conditions, opening the door for potential new treatment options for CF patients.

INVESTIGATING MITOCHONDRIAL DYSFUNCTION LINKED TO AN ORPHAN PROTEIN IN BIPOLAR DISORDER

Taylor Dzikowski - Biochemistry
Supervised by Dr. Mohan Babu

Bipolar disorder (BD) is a complex neuropsychiatric disease (NPD) that impacts millions of lives worldwide. BD is associated with dramatic mood changes characterized by episodes of mania and depression. Although the complete disease etiology remains complex, increasing evidence suggests a relationship between BD and mitochondrial dysfunction. This research assesses the role of the orphan mitochondrial protein BDMT2 concerning proper mitochondria functioning and BD. Preliminary findings suggest that BDMT2 mRNA transcript and protein levels are upregulated in BD patients compared to healthy controls. BDMT2 protein-protein interactions (PPIs) were also identified using immunoprecipitation coupled with mass spectrometry. These PPIs have directed the functional assignment of this orphan protein toward potential mitochondrial processes of interest, one of those being oxidative phosphorylation.

IF ROCKS COULD TALK: LASER ABLATION MAPPING OF 2.5 BILLION-YEAR-OLD BANDED IRON FORMATIONS

Katie Kreutzer - Geology
Supervised by Dr. Leslie Robbins

Banded iron formations (BIFs) are iron and silica-rich sedimentary rocks that precipitate directly from seawater and are abundant in Earth's deep past – providing a look into Earth's evolving oceanic conditions over billions of years. Laser mapping of these rocks provides high resolution of the cyclical banding associated with trace metals, essential for microscopic cyanobacteria in early Earth. A deeper understanding of early life of this kind can provide a framework and benchmark in the search for extraterrestrial life across the Universe.

SEMANTICS IN ARITHMETIC CIRCUIT INFERENCE

Kadence Meredith - Computer Science
Supervised by Dr Cory Butz

An Arithmetic Circuit (AC) is a deep learning probabilistic model that is compiled by eliminating every variable in a given Bayesian Network (BN). Introduced in this poster is a special case of AC, called a p-AC, in which every node is a 1, marginal, or conditional of the joint distribution defined by the given BN. This is accomplished by using the key idea of wait-sets to restrict the elimination ordering used. There are both theoretical and practical advantages of p-ACs over ACs, including that there is no increase in network size.

SOLVING THE ELECTRICITY TECHNICIAN DISPATCH PROBLEM

Mehdi Sadeghilalimi - Computer Science
Supervised by Dr. Malek Mouhoub

The Multi-Depot Vehicle Routing Problem (MDVRP) is a crucial extension of the Vehicle Routing Problem (VRP), gaining significant attention across various transportation applications. Its objective is cost minimization while navigating routes from initial depots. This study delves into a specific MDVRP variant known as the Electricity Technician Dispatch Problem (ETDP). Addressing the NP-hard nature of ETDP, we propose an efficient hybrid approach. Initially utilizing a modified K-means clustering, we identify suitable customer sets based on technician availability, demand, and proximity. Subsequently, employing nature-inspired techniques and exact methods, we determine optimal routes for these customer sets. Experimental results demonstrate the effectiveness and promise of our solving method.

UPGRADE OF THE FORWARD CALORIMETER FOR THE JEFFERSON LAB ETA FACTORY PROJECT

Madelyn Kaban - Physics
Supervised by Dr. Zisis Papandreou

The JEF project aims to measure η and η' decays with the physics goals of testing the Standard Model and searching for new physics Beyond the Standard Model. The JEF experiment is being upgraded using an 80x80cm^2 lead tungstate insert, composed of an array of 1596 2x2x18cm^3 crystal modules. The upgraded calorimeter will improve the position and energy resolutions by a factor of two, the granularity by a factor of four and radiation-resistance by a factor of 10.

FACTORS THAT LIKELY DRIVE MOBILE GENE EVOLUTION IN NATURAL ECOSYSTEMS

Laura Schnell - Biology
Supervised by Dr. Andrew Cameron

Pathogenic, antibiotic-resistant (AR), and toxin-producing bacteria are commonly found in freshwater and pose a threat to the integrated health of people and ecosystems. These bacteria can transfer mobile genetic elements (MGEs) that confer these detrimental traits to other cells in a community. This means some genes can spread faster than others and persist even after the original bacterial species disappears. Despite their vital importance to bacterial evolution, little is understood about MGE ecology. I will sequence and assemble plasmids present in two freshwater environments to examine microbial connections between water, animals, and humans.

INTERSEXUAL DIFFERENCES IN MYOTIS LUCIFUGUS FORAGING ACTIVITY, AND DISTANCE FROM DAYTIME ROOST SITES IN CYPRESS HILLS, SASKATCHEWAN

Siobhan Cunningham - Biology
Supervised by Dr. Mark Brigham

Little brown bats (Myotis lucifugus) are endangered due to White Nose Syndrome (WNS), a fungal disease which interrupts hibernation. Individuals who enter hibernation in the best condition are most likely to survive WNS. As such, survival may also be influenced by successful summer foraging. Individuals were caught in mist nets, affixed with transmitters, and tracked to diurnal roost sites. Data will assess the distance bats travelled to forage. I predict all bats will forage close (<2 km) from daytime roosts. Since females experience higher reproductive demands, I also predict that reproductive female bats will forage closer than male bats.

INVASION OF CLONES IN SASKATCHEWAN WATER: THE STUDY OF PRUSSIAN CARP AND ITS MERCURY CONTENT

Yuliya Shtymburska - Biology
Supervised by Dr. Britt Hall and Dr. Chris Somers

Prussian carp is a new invasive species in Saskatchewan that has recently been introduced to our waters. My goal is to learn more about this species, and a great area to start is the mercury content of carp.

WHAT'S IN THE GENOME: USING COMPARATIVE GENOMICS TO DETERMINE THE GENETIC HISTORY OF PANTOEA AGGLOMERANS

Mohammed Quraishi - Biology
Supervised by Dr. John Stavrinides

Pantoea agglomerans is a bacterial species with a wide range of marvellous capabilities. It is able to infect both plants and humans, and it can also live symbiotically within some insects. It has also been found to produce novel antibiotics against clinical and agricultural pathogens. To better understand this organism, a comparative genomics study was undertaken to explore the evolutionary history of *P. agglomerans*. A pangenome matrix revealed a few strains with a unique set of genes that were different from the others, and ANI analysis, using the entire proteome, revealed that those strains were a previously unknown lineage of *P. agglomerans*.

SESSION THREE: PAPER PRESENTATIONS

59 / **ZOHRA ZAHIR**

ARE MICROBIAL COMMUNITIES DIFFERENT IN PRAIRIE WETLANDS PONDS WITH ELEVATED METHYLMERCURY CONCENTRATIONS?

60 / **NASIK SAMI KHAN**

INTRUSION AND VULNERABILITY DETECTION IN SOFTWARE-DEFINED NETWORKS (SDN)

61 / **PERI MOULDING**

STUDYING HOST-PATHOGEN INTERACTIONS TO UNCOVER NOVEL ANTIMICROBIAL STRATEGIES

62 / **ALESHA STARK**

THE RE-EMERGENCE OF THE HUNTRESS: FIRST FINDINGS FROM THE FIELD

63 / **ASHLYN KIRK**

A REPLICA PLATING METHOD FOR EFFICIENT, HIGH-THROUGHPUT SCREENING OF ANTIBIOTIC GENE CLUSTERS IN BACTERIA UNCOVERS A HOLOMYCIN-LIKE CLUSTER IN THE CLINICAL ISOLATE, PANTOEA AGGLOMERANS 20KB447973

ARE MICROBIAL COMMUNITIES DIFFERENT IN PRAIRIE WETLANDS PONDS WITH ELEVATED METHYLMERCURY CONCENTRATIONS?

Zohra Zahir - Biology
Supervised by Dr. Britt Hall

Methylmercury (MeHg) is a neurotoxin that poses a significant threat to aquatic ecosystems, wildlife, and human populations through seafood consumption. Microbial communities in wetlands play a crucial role in the transformation of mercury. However, the control mechanisms governing microbial activities and Hg transformations in these ecosystems remain poorly understood. We investigated eight prairie wetland ponds with MeHg concentrations ranging from 0.085 to 3.14 ng/L. Distinct patterns in the microbial communities of the prairie wetland ponds were observed with varying MeHg concentrations. Our study demonstrates that some ponds exhibited similar microbial communities while others displayed differences, depending on a complex interplay between environmental factors and microbial structure.

INTRUSION AND VULNERABILITY DETECTION IN SOFTWARE-DEFINED NETWORKS (SDN)

Nasik Sami Khan - Computer Science
Supervised by Dr. Nashid Shahriar

The goal of this research is to address the challenge of tackling the Intrusion Detection System in SDN environments and 5G networks. This research explores the development of multiclass classifiers for identifying intrusion types in SDN-enabled networks. Machine learning techniques are employed to create effective intrusion detection models, thereby protecting SDN-based networks against various threats. Our future work includes addressing challenges with minority classes, exploring alternate feature engineering, optimizing threshold values, and refining the ensemble model architecture. I'll discuss the problem, proposed solution, result discussion, current works, and future direction.

STUDYING HOST-PATHOGEN INTERACTIONS TO UNCOVER NOVEL ANTIMICROBIAL STRATEGIES

Peri Moulding - Biochemistry
Supervised by Dr. Omar El-Halfawy

Methicillin-resistant Staphylococcus aureus (MRSA) is the leading cause of hospital and community-acquired infections. Polyamines are chemicals overproduced at infection sites and the most prevalent community-acquired MRSA strain, USA300, can detoxify polyamines, in part by an enzyme called SpeG. I set out to discover inhibitors of polyamine detoxification in bacteria that can block the microbe's ability to cause infection. I performed a high-throughput chemical screen and identified a compound that synergizes strongly with spermine and exhibits growth-inhibitory effects against USA300. The compound exhibits a dual mode of action, where high concentrations disrupt the membrane, and lower concentrations inhibit SpeG. This work provides insight into understudied aspects of chemically-mediated host-pathogen interactions and may offer a new treatment strategy for multidrug resistant pathogens.

THE RE-EMERGENCE OF THE HUNTRESS: FIRST FINDINGS FROM THE FIELD

Alesha Stark - Anthropology
Supervised by Dr. Alex Oehler

Contrary to previous beliefs surrounding the sexual division of labour and the understanding of the male-female/ hunter-gatherer binaries, current archaeological research has uncovered historical evidence of females' involvement in the hunt. In Canada there has recently been an increase in the number of females partaking in sustenance hunting activities. This current research aims to develop an understanding of how female hunters engage with their senses during the hunt, how they may be aware of other animals' social relations, and how they may utilize different hunting techniques than their male counterparts. Preliminary results pose the potential to shift perspectives of gendered stereotypes within and around this practice.

A REPLICA PLATING METHOD FOR EFFICIENT, HIGH-THROUGHPUT SCREENING OF ANTIBIOTIC GENE CLUSTERS IN BACTERIA UNCOVERS A HOLOMYCIN-LIKE CLUSTER IN THE CLINICAL ISOLATE, PANTOEA AGGLOMERANS 20KB447973

Ashlyn Kirk - Biology
Supervised by Dr. John Stavrinides

Natural products from bacteria are a major untapped source for novel antimicrobial scaffolds. In this study, we describe a replica-plating approach to quickly uncover antimicrobial biosynthetic gene clusters in bacteria without the need for special equipment. We used this technique to uncover a holomycin-like gene cluster in P. agglomerans 20KB447973 responsible for producing a broad-spectrum antibiotic. The adoption of this technique by others could allow for quick and simple exploration of potentially novel antimicrobial biosynthetic gene clusters within laboratory strain collections, advancing the search for novel antimicrobials to fight multi-drug resistant pathogens.

SESSION FOUR: DATA BLIZ

65 / **BEHNAM FARZANEH**
DEEP TRANSFER LEARNING-BASED INTRUSION DETECTION SYSTEM IN 5G NETWORKS

66 / **SHARMIN JAHAN MIM**
ANALYSIS OF ECONOMIC TRENDS AND EMPLOYMENT IMPACTS IN WASTE MANAGEMENT INDUSTRY: INSIGHTS FROM FOUR WESTERN CANADIAN PROVINCES

67 / **SARAH-MAUDE GEMME**
BENEFITS OF TOURISM IN FRANCOPHONE MINORITIES' HERITAGE PRESERVATION

68 / **SIRVAN PARASTEH**
A NOVEL PROBABILISTIC APPROACH FOR DETECTING CONCEPT DRIFT IN STREAMING DATA

69 / **OKORO NKEM JENNIFER**
THREE DIMENSIONAL SEISMIC ATTRIBUTE ANALYSIS AND PETROPHYSICAL CHARACTERIZATION OF RESERVOIR SANDS OF THE AGBADA FORMATION IN THE 'SIGMA" FIELD, OFFSHORE DEPOBELT, NIGER DELTA BASIN, NIGERIA

70 / **MANDANA GHOLAMIGAZAFRUDY**
BIOGEOGRAPHY-BASED OPTIMIZATION (BBO) FOR DIMENSIONALITY REDUCTION

71 / **EMMA BLANKEN**
INTERSEXUAL ROOST SITE SELECTION BY THE LITTLE BROWN BAT IN CYPRESS HILLS, SASKATCHEWAN

72 / **RILEY HERMAN**
MULTI-OBJECTIVE FINANCIAL PORTFOLIO OPTIMIZATION WITH RESPECT TO ESG METRICS

DEEP TRANSFER LEARNING-BASED INTRUSION DETECTION SYSTEM IN 5G NETWORKS

Behnam Farzaneh - Computer Science
Supervised by Dr. Nashid Shahriar

In the complex landscape of modern networks, the necessity of Intrusion Detection System (IDS) has become paramount. An IDS is a crucial cybersecurity tool that plays a pivotal role in safeguarding networks against a wide array of threats and attacks. The application of deep learning models for intrusion detection is becoming popular among research communities due to its success in many other domains. However, deep learning models require a significant amount of labeled data to achieve effective training. Obtaining labeled data for intrusion detection can be challenging and costly. To address it, Deep Transfer Learning (DTL) can be employed. This research introduces an innovative traffic classification method tailored for 5G networks. The approach leverages deep transfer learning by utilizing pre-trained models and fine-tuning them. We evaluate several deep-learning models in a transfer learning setting. The Inception model being identified as the top-performing model shows an improvement of approximately 10% in terms of F1-score between IDS-based DTL and the same scheme without DTL.

ANALYSIS OF ECONOMIC TRENDS AND EMPLOYMENT IMPACTS IN WASTE MANAGEMENT INDUSTRY: INSIGHTS FROM FOUR WESTERN CANADIAN PROVINCES

Sharmin Jahan Mim - Environmental Systems Engineering
Supervised by Dr. Kelvin Tsun Wai Ng

Globally, enormous growth in solid waste generation and its effective management have emerged as a crucial concern. This study emphasized data analysis, enabling government and private waste management organizations to strategically deploy an optimized workforce, thereby achieving increased revenue growth, based on the demands of waste diversion and disposal facilities within the Waste Management Industry (WMI). This analysis can be used in understanding the WMI and their respective waste management systems. Thus, it may help the policymakers to properly understand the business and employee characteristics in WMI to develop strategic policies for achieving better waste diversion rates and increased revenue.

BENEFITS OF TOURISM IN FRANCOPHONE MINORITIES' HERITAGE PRESERVATION

Sarah-Maude Gemme - Études francophones et interculturelles, History
Supervised by Dr. Michael Poplyansky

Tourism brings pride and strength to small marginal communities. It is experiencing heritage. This analysis of the literature molds heritage as a turning point in the public recognition of the francophone community in North America. Working with the past allows communities to valorize themselves. It is creating a cultural identity and promoting it. Benefits trough tourism will be discussed based on experiences in Acadia, Ontario, and British Colombia. This research is inspired by a Fransaskois who wishes to develop good experiences trough tourism for the French community in Saskatchewan.

A NOVEL PROBABILISTIC APPROACH FOR DETECTING CONCEPT DRIFT IN STREAMING DATA

Sirvan Parasteh - Computer Science
Supervised by Dr. Samira Sadaoui

In this research, we present PRDD, a novel probabilistic approach tailored for the precise detection of Real Concept Drift (CD) in streaming data. Central to PRDD's methodology is its utilization of classifiers' prediction errors and confidence levels, a strategy that adeptly identifies Real CD scenarios. Our comprehensive empirical study spans 16 synthetic datasets, encompassing both Abrupt and Gradual drift types, and places PRDD in direct comparison with established CD detection methods. The findings reveal PRDD's high-performance capabilities. Notably, PRDD demonstrates a time complexity of O(1) per data point, underscoring its computational efficiency, particularly critical in high-velocity data stream environments.

THREE DIMENSIONAL SEISMIC ATTRIBUTE ANALYSIS AND PETROPHYSICAL CHARACTERIZATION OF RESERVOIR SANDS OF THE AGBADA FORMATION IN THE 'SIGMA" FIELD, OFFSHORE DEPOBELT, NIGER DELTA BASIN, NIGERIA

Okoro Nkem Jennifer, Geology
Supervised by Dr. Osman Salad Hersi

The study of the Tertiary Agbada Formation of the Niger Delta Basin comprising of prolific hydrocarbon reservoir sands is key to successful exploration and production activities in the Niger Delta. Thus, this research focuses on the characterization and documentation of the Agbada reservoirs occurring in the "Sigma" field, offshore, Niger Delta Basin, Nigeria. An integration of three dimensional (3D) seismic attribute analysis, petrophysical characterization of identified reservoir sandstones and core data analysis is used to achieve this aim. It is expected that an effective delineation of these hydrocarbon sands will maximize hydrocarbon production with minimal cost and risk.

BIOGEOGRAPHY-BASED OPTIMIZATION (BBO) FOR DIMENSIONALITY REDUCTION

Mandana Gholamigazafrudy- Computer Science
Supervised by Dr. Malek Mouhoub

The K-means algorithm is widely used for data clustering due to its efficiency, but it has limitations like treating all features equally. To enhance its accuracy, a Biogeography-Based Optimization (BBO) algorithm is employed for feature selection, aiming to reduce intra-cluster distance and increase inter-cluster distance. The Davies-Bouldin index is utilized, comparing this evolutionary- based clustering with baseline K-means across various datasets. Experiments against PCA and nature-inspired techniques are also conducted, evaluating using elbow, silhouette, and Davies-Bouldin metrics. Results indicate the effectiveness of the proposed algorithm in selecting relevant features, emphasizing feature selection's role in enhancing K-means clustering

INTERSEXUAL ROOST SITE SELECTION BY THE LITTLE BROWN BAT IN CYPRESS HILLS, SASKATCHEWAN

Emma Blanken - Biology
Supervised by Dr. Mark Brigham

Habitats and roosts within them are limiting to species persistence because their composition and availability affect fitness. Reproduction and survival are reasons why animals select habitats. During summer, the endangered little brown bat undertakes life history processes that affect fitness. Females are pressured to successfully reproduce. It is expected that females roost closer to where they forage to conserve energy for this process. I caught little brown bats in Cypress Hills, Saskatchewan and compared daytime roosts intersexually. Characterization of habitats, roosts within them, and life history processes supported by their selection can inform how fitness and habitat selection are linked.

MULTI-OBJECTIVE FINANCIAL PORTFOLIO OPTIMIZATION WITH RESPECT TO ESG METRICS

Riley Herman - Computer Science
Supervised by Dr. Malek Mouhoub

Financial portfolios are commonly measured by two key metrics - risk and return. However, as the public conscious grows around environmental, social, and corporate governance, the demand for financial portfolios that reflect the values of investors also grows. I use genetic algorithms in order to achieve high performing TSX portfolios that minimize risk, maximize return, and optimize key ESG metrics. This work includes a survey used to evaluate an individual's risk and ESG expectations. A collection of these survey results yields a set of weights for each metric (i.e. how important risk, return, environmental score, social score, governance score are to that individual) which allows a portfolio from the set of the best portfolios to be matched to an investor.

THANK YOU

We hope that you have enjoyed attending our symposium as much as our team has enjoyed putting it together! The INSPIRE Research Symposium started as a simple idea. Our team was unsure of how much engagement we would get and how successful it would be. Needless to say, we are *blown away* by the level of engagement from the students, faculty members, supervisors, and other professional staff.

First, we would like to say a huge and special thank you to **all the presenters**. Simply put, without you, this symposium would not have been a success.

We would also like to thank our keynote speaker **Dr. Melanie Unrau**. Thank you for sharing your knowledge and guidance with everyone. Your academic success is a strong motivation for students.

Thank you to **Dr. Maria Velez** and **Dr. Chris Oriet** for your presentation on graduate studies at the University of Regina.

A sincere thank you to our judges for the poster session of the symposium, **Dr. Alex Oehler**, **Dr. Raymond Deschamps**, and **Dr. Stephen King**.

We are very appreciative of the level of support and engagement by **professional members** at the University of Regina.

We would also like to extend a huge thanks to the **Faculty of Graduate Studies and Research**, the **Dean**, **Dr. Aziz Douai** and **Roberta Bell**. Without your continued support and guidance, this INSPIRE Research Symposium would not have happened.

This concludes the first INSPIRE Research Symposium, but stay tuned for more future events from **INSPIRE!**

Best wishes,
The INSPIRE Team

University of Regina

Go far, together.

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