SOURCE

SYMPOSIUM of UNIVERSITY RESEARCH & CREATIVE EXPRESSION

2020

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DES MOINES
MAY 12 | ELLENSBURG
MAY 13 & 14

Symposium for University Research and Creative Expression (SOURCE)

The Office of Undergraduate Research and the SOURCE Committee would like to applaud all student presenters. There were 214 presentations across disciplines and colleges, over 22,000 views, and 860 posted comments. Thank you for participating in SOURCE 2020, particularly during this challenging time!

The mission of the Symposium for University Research and Creative Expression (SOURCE) is to provide a university-wide forum for Central Washington University (CWU) students, encouraging equity, diversity, and inclusivity, representing all disciplines and experience levels, to present their mentored research, scholarship, and creative works in a juried environment that meets professional conference standards and expectations. Accomplishing this mission will foster best-practice-teaching and mentoring, promote the significance and relevance of research, scholarship and creative works, engage a range of CWU stakeholders in distinguishing aspects of CWU's educational environment, and enhance the professional skills of students.

SOURCE 2020 Award Winners
Congratulations!

The James and Katie Gaudino Scholar of the Year Awards

The James and Katie Gaudino Scholar of the Year Awards for Creative Expression and Scholarly Research acknowledge and reward those students who present at SOURCE and whose work activities and accomplishments provide examples of exceptional dedication to the scholarship experience.

Awardee, Creative Expression:
Jonah Kathlean, *Anthropology & Museum Studies*

Awardee, Scholarly Research:
Mariah Hogan, *Law & Justice*

Nominees:
Kevin Cassidy, *History*
Bart Hasz, *History*
Mariah Hogan, *Law & Justice*
Jonah Kathlean, *Anthropology & Museum Studies*
Alex Muetze, *History*
Rachel Walker, *Computer Science*
Jasmin Washington, *Health Sciences*

Graduate Student Scholar of the Year Award

Awardee:
Hermann Yepdjio Nkouanga, *Computer Science*

Nominees:
Amanda Moody, *Geography*
Katie Omans, *History*
Jordan Ryckman, *Biological Sciences*
Hermann Yepdjio Nkouanga, *Computer Science*

Mentor of the Year

Awardee:
Jamie Gilbert, *Communication*

Nominees:
Yukari Amos, *Education, Development, Teaching & Learning*
Razvan Andonie, *Computer Science*
Tonya Buchanan, *Psychology*
Kara Gabriel, *Psychology*
Jamie Gilbert, *Communication*
Christine Henderson, *Law & Justice*
Jill Hoxmeier, *Health Sciences*
Arne Leitert, *Computer Science*
Lene Pedersen, *Anthropology & Museum Studies*
Dion Rivera, *Chemistry*
Darci Snowden, *Physics*

Brookes Library reSOURCE Award

CWU Libraries and the Friends of the Brooks Library reSOURCE award is for outstanding use of library resources in your project. This includes books, journals, Archives & Special Collections, databases, library equipment, and even our programs and spaces!

Awardees:
Anthony Krueger, *English* and *William O. Douglas Honors College*
Brittney Murphy, *Law & Justice*
Amber Richardson, *Education*
Benjamin Valdez, *Law & Justice*

Honorable Mentions:
Kerry Bleakney, *Law & Justice*
Angela Kyle, *Accessibility Studies*

College of Arts & Humanities
Presentation Award Winners

Presenter: Parker Gliessman, *Theatre Arts*

Mentors: Scott Robinson & Emily Rollie, *Theatre Arts*

Title: Cataloging and Archiving CWU Theatre Department's Collection of Historic Clothing

Abstract: The CWU theatre department maintains a collection of 400-500 antique clothing items that have been set aside from our overall working collection due to their historical significance or lack of strength for use in production. While these garments may have a less obvious purpose than our stage worthy collection, they do serve as an incredible working resource in overall historical style trends and historical garment construction. Unfortunately, due to the constant growth of this collection, storage space and archival resources have become scarce. This has prevented the proper storage and archival of these garments, causing them to be stored in ways that are detrimental to their existence. I decided I wanted to preserve this collection and increase its accessibility so that it continues to serve as a resource for future fashion historians to come. For my senior research course last quarter, I began by researching methods and products of clothing archival and determining the best way to archive this collection. I then sorted through and roughly photographed and then cataloged the first portion of garments into a rudimentary online database. Separately, I continued documenting the remaining garments and completing my database for my UNIV 400 course with intentions of fully completing my process early this quarter. Unfortunately, the current circumstances due to the COVID-19 pandemic have potentially postponed my completion until I am able to physically return to campus. However, I am still applying for grants to hopefully secure funding to follow through with proper archival once I am able.

Presenter: Sawyer Henry, *English*

Mentor: Christopher Schedler, *English*

Title: Tracing the Influence of Eastern Philosophy on Western Modernism in Virginia Woolf's Mrs. Dalloway

Abstract: The modernist period ushered forth numerous scientific discoveries and philosophical theories that had a notable influence on art, literature, psychology, and philosophy. Discoveries such as Einstein's General Theory of Relativity and Darwin's Theory of Evolution inspired theologians, philosophers, and psychologists to focalize new concepts of self, identity, time, reality, and human experience. These shifts in contemporary human understanding happened in concurrence with increased global travel and intellectual exchange between Western and Eastern countries. As a result, writers, philosophers, and artists became more interested in Buddhism, Hinduism, and other Eastern philosophical beliefs. Virginia Woolf, while being a self-

proclaimed atheist, was deeply influenced by Eastern religious philosophy and well versed in contemporary scientific theories. Drawing on literary and biographical criticism on Virginia Woolf, I trace the intersections of Eastern philosophical beliefs and Western scientific discoveries through the stream of consciousness narration of Mrs. Dalloway by analyzing both what and how things are experienced by individual characters. In the novel, the integration of each character's stream of consciousness fabricates a dissonant medium in which singular moments in the present time are experienced through the minds of multiple characters, while they simultaneously navigate past spans of time within their individual narrative consciousness. Through the analysis of narrative form and narrative consciousness in Virginia Woolf's Mrs. Dalloway, it is possible to track the impact of distinct Eastern philosophies that were being merged with Western scientific theories in Britain's academic and artistic communities during the early 1900s.

Presenter: Laura Mentele, *Art + Design*

Mentor: Rachel Kirk, *Art + Design*

Title: (Pneuma) Revealed: A C. Farrell Fine Arts and Research Project

Abstract: I often see a disconnect between who we believe a person to be and who they truly are. My work is influenced by this idea. It is an exploration of how humans projected 'identity' and a visual representation of the hidden emotions or things we are unable or unwilling to see in others. With this project I created a body of work that speaks about inner pain. Rather than hiding it, I revealed these hidden emotions. As a reflection of my myself and my own gender, I approached this concept by using all female figures for references. I made deliberate formal choices focusing on composition, additive and reductive painting techniques along with added hints of text in order to convey emotional implications. I additionally focused on human connection as it pertains to the eyes. Eyes are important facets of how humans relate to others and are firmly rooted to ideas surrounding expression of emotion and identity. In western culture, eye contact is associated honesty and confidence, which acts in dichotomy to my ideas of hiding and revelation. As such, I have affected the eyes of my figures through application of paint or obscured them through formal and compositional decisions, thereby changing how the viewer relates to the piece. The resulting body of work consists of seven paintings and three drawings of women. All images speak towards ideas of pain, identity, vulnerably and, for some, the strength of one's self during an ordeal. While creating my work I meditated on the fact that people are often unseen and/or misinterpreted. It is my goal that my body of work generates a conversation on how we hide this pain and how the person before us could be experiencing something we do not realize.

Presenter: Katie Omans, *History & School of Graduate Studies*

Mentor: Jason Knirck, *History*

Title: The Belfast Boycott: Sectarianism in Anti-Partition Rhetoric

Abstract: The Belfast Boycott was a protest designed to dislodge loyalism in Northern Ireland and punish its adherents for perceived intolerance toward Catholics. The boycott was set off by the expulsion of several thousand Catholic workers from employment in Belfast in July 1920. A total boycott of all goods coming from Belfast was implemented in September 1920. Both unionists and nationalists attempted to legitimize their actions in the context of the boycott by framing them as non-sectarian, realizing the need to distance themselves from accusations of religious bigotry. For the boycott to be viewed as legitimate, it had to be framed as a political, rather than a religious, act. However, the Dáil's goals regarding the boycott were both political and economic. One of these goals was to punish Belfast for unfair treatment of Catholics. The larger goal of the boycott, however, was to eliminate Protestant ascendancy and end partition. One key aspect of boycott promotion was the assurance that only by boycotting could partition end. This paper will explore the ways in which southern Irish nationalists used the Belfast Boycott, often in contradictory ways, to attempt to both punish Belfast while simultaneously calling for Irish unity.

Presenter: Blake Trujillo, *Philosophy & Religious Studies* and *Women's, Gender & Sexuality Studies*

Mentor: Lily Vuong, *Philosophy & Religious Studies*

Title: A Feminist Reading of Genesis: The Problematic Argument of Precedence for Female Ordination in the Catholic Church

Abstract: In my presentation I will discuss the issues around the Catholic church claiming the argument of precedence for their ban on female ordination. Through the lens of the prominent feminist scholars in the field, chiefly Phyllis Trible and Elaine Pagels, I reexamine the Genesis story and point out the inconsistencies in the interpretations of Genesis adopted by the Catholic church. Instead of the common portrayal of Eve as a weak willed, unintelligent temptress, I argue that she is instead the very founder of humanity and the progenitor of free will. By deconstructing these faulty interpretations put forth by many of the early church fathers, we get not only a more equitable view of Christianity, but a more accurate one.

College of Business
Presentation Award Winners

Presenter: Jargal Ganzorig, *Business, Finance & Supply Chain Management*

Mentor: Thomas Tenerelli, *Business, Finance & Supply Chain Management*

Title: United Airlines Holdings (UAL) Stock Evaluation

Abstract: This presentation will analyze a company to determine its worthiness as an investment vehicle. A summary of the business will be provided and the competitors will be identified. The company's market position and growth opportunities will be evaluated. That evaluation will be translated into quantitative assumptions on growth in a two-stage discounted cash flow model of company valuation. The company's value will be estimated and presented using a detailed financial model in Excel.

College of Education & Professional Studies
Presentation Award Winners

Presentation: Sultan Alhajri, *Engineering Technologies, Safety & Construction*

Mentor: John Choi, *Engineering Technologies, Safety & Construction*

Title: Fire Fighter Robot

Abstract: The Fire Fighter Robot has been made in this project which can fight against the fire and that should be controllable over WiFi from the particular distance. The main objective of the design was that to fabricate the frame of the robot on which the whole top part of the robot can sit. The main constraint was that high-level skills were required for the implementation of some sections. The bottom part of the robot was first designed on the SOLIDWORK and Fusion360 software. the Whole dimensions were set for the bottom part so that the water tank, camera and the top frame can easily sit on it. During the mechanical checkup of the cart it was found that the velocity of the cart was 2 m/s while during the one rotation the cart was covering the 12.56 inches' distance. During the motion on the smooth surface the force of the friction was found to be 313.9 N. The chained wheel in this part of the project had 52 links while the bottom part had the size of 33 lb. All the purchases were done from the Amazon except a few widgets were manufactured in a machine shop. To assemble all the parts with the chaises, few widgets were made such as the battery base, camera base robotic arm holder. All the widgets were manufactured by a CNC milling machine, lathe and a 3D printer. The final product which was made after joining the bottom and top part was able to move nicely on the floor. The cost of the whole project remained in the specific limits which was forecasted before the start of the project. All the drilling and assembling process was completed within the timeline. The robot was able to work quite perfectly in 70-degree Celsius Temperature.

Presenter: Joseph Key, *Engineering Technologies, Safety & Construction*

Mentor: Craig Johnson, *Engineering Technologies, Safety & Construction*, and Charles Pringle, *Mechanical Engineering Technology*

Title: Drone Payload Storage & Release System

Abstract: The retail giant Amazon has become a household name synonymous with nearly instantaneous online shopping. What previously took weeks to deliver at exorbitant shipping fees can now arrive at your doorstep within two days—and all for free. This huge buyer incentive has skyrocketed the demand for online shopping, making Amazon the most valuable brand in the world. To meet this demand, Amazon and its distributors have proposed using drones to make deliveries. However, due to issues with cost and complexity, this has not yet materialized. As such, this project's objective was to create a cheap and lightweight package-delivery system that can be easily mounted onto a drone—the popular DJI Phantom 4 Pro. The approach was simple: create a purely mechanical system, eliminating the need for complex electronics. This was

accomplished via the drone's built-in camera, which can move down to trip the package release trigger at the user's input. The entire system is attached to the drone via quick-release clamps. The project was constructed entirely using 3D-printing. This allows for the system to be manufactured cheaply within a matter of hours rather than days or weeks. The system was designed to store payload using a hybrid cage, which swings open to release packages. Testing has found that the system weighs only 5.31-oz, can carry packages up to 8x6x3" and 1.25-lb, and can travel up to 2 miles fully loaded. Finally, the system can be produced on a small scale for less than $60.

Presenter: Angela Kyle, *Accessibility Studies*

Mentor: Naomi Petersen, *Accessibility Studies*

Title: Online Inclusivity - The New Normal or a Passing Trend?

Abstract: A Central Washington University student majoring in Accessibility studies along with Dr. Naomi Petersen introduced the ASP Club Initiative. The ASP Club for Accessibility minor and certificate students at CWU will be finalized in Spring Quarter 2020. This project's objective is to support students with the planning of internships for service-learning, social online interaction to reduce feelings of isolation for online students, increase involvement and inclusivity for all students to be involved, social collaboration among students, and capstone project enhancement. Resources related to their coursework, community volunteer opportunities, and leadership positions will also be created for ASP club officers and members. The ASP Club will promote and increase the awareness of the Accessibilities program at CWU, ADA, accommodations for students at CWU, and awareness of PWD and our community's plan of inclusion for all. Planning stage 1 of recruitment, CWU club policy and procedure, recruitment and content creation occurred during Winter Quarter 2020. Preparation stage 2 of recruitment, completion of club forms and policy packet, officer induction, and media/canvas set up will occur during Spring 2020. Implementation stage 3 of rollout, engagement, officer training, support of Summer Certificate students, and preparation for Fall 2020 field trip will occur during Summer 2020. This project will include research on the change from classroom instruction to online instruction and the restructure of our campus clubs and events to online formats and the impact on our future. COVID-19 has opened the door to more online social interactions and the positive occurrence of inclusivity for all individuals including people with disabilities. Can we continue this trend of inclusivity for all or will it return to the days prior to COVID-19 where individuals were excluded from certain activities?

Presenter: Kelson Mills, *Engineering Technologies, Safety & Construction*

Mentor: Craig Johnson, *Engineering Technologies, Safety & Construction*

Title: Composite Ruddervator Replacement

Abstract: The Beechcraft V-tail Bonanza is a popular general aviation aircraft. Over 10,000 were built, but with the weakness of magnesium skinned control surfaces. Control surfaces on aircraft must be light, and precisely balanced. The V-tail Bonanza uses a unique "ruddervator" system, which combines the rudder and elevator into one surface to reduce drag, controlling the pitch and yaw of the aircraft. Magnesium was chosen by the designers for its lightweight properties, but corrodes badly and is becoming difficult to source for replacement parts. Aerodynamic flutter, from flexibility in the lightly built surface, and corrosion can cause breakup in flight, and has grounded many aircraft. A complete replacement is needed, but cannot be constructed of aluminum due to its weight. In this project, a cored carbon fiber composite material was used to construct a prototype. The dimensions and mounting hardware are unchanged from the original surface, allowing a direct swap onto the aircraft, with no changes to controls, trim, or cable routing. Carbon fiber will not corrode, and is an extremely stiff material. Two layers of biaxial carbon fiber cloth are separated by a solid foam core, with bolted hinge attach points. The prototype was tested by static loading using sandbags in a welded steel jig, simulating an aerodynamic load, while measuring the distance of deflection, and eventual failure point, to identify weak points and stress concentrations. The new surface was shown to have a 20% improvement in stiffness and strength over the original, as well as reducing aerodynamic drag.

Presenter: Rowdy Sanford, *Engineering Technologies, Safety & Construction*

Mentor: Lad Holden, *Engineering Technologies, Safety & Construction*

Title: The Atlas Project

Abstract: The Atlas Project started as a "simple" retrofit to bring a handful of old Atlas-II robotic arms, built in the 1980s, into the modern age of computing, as a low-cost solution for robotics trainers. The initial challenge with the project was reverse engineering the functionality of the original control system, with the only documentation available being a technical manual and a user manual, both lacking sufficiently detailed information to determine the bit-level operation of the hardware. Through experimentation the function of the circuit was deduced, and a testing setup was constructed to begin using LabVIEW, a data acquisition and control programming environment developed by National Instruments, to design a control system using a USB Data Acquisition module (DAQ) as a replacement for their "micro card." LabVIEW was chosen as the programming environment for the flexibility of the programs, called virtual instruments (VIs),the documentation tools and the graphical programming interface. In the years since the retrofit process began, this project has undergone multiple revisions. The driving force

of the project was to reduce the cost of teaching hands-on industrial robotics, and give students the tools to apply their knowledge in a tangible way.

Presenters: Tierra Willoughby, Sabrina Fuentes, Kailie Jenkins and Ashlyn DiDonato, *Family & Consumer Sciences*

Mentor: Amy Claridge, *Family and Consumer Sciences*

Title: Food Insecurity During Childhood and Later Attachment in Personal Relationships

Abstract: According to existing literature, experiencing food insecurity can be linked to negative outcomes for children and their parent(s). There is not enough research on the correlation between food insecurity in childhood and attachment in adulthood. In the present study we looked at the correlation between experiences of food insecurity in childhood and attachment in adulthood. Participants were recruited through social media. In total, 262 adult participants completed an anonymous online survey. Results indicated a connection between food insecurity in childhood and attachment in adulthood, meaning those who experienced food insecurity as an adolescent, were more likely to struggle with attachment in adulthood.

Presenter: Jasmin Washington, *Health Science*

Mentor: Jill Hoxmeier, *Health Sciences*

Title: Strength Under Pressure

Abstract: Intimate Partner Violence (IPV) is a prominent public health issue in the U.S., and evidence suggests that IPV disproportionately affects Black women. Additionally, Black women who are victimized may be reluctant to report and/or seek supportive services. Given these disparities, it is important to understand the context of IPV in the Black community. Although the Superwomen Schema (SWS) conceptual framework's utility for explaining other health-related outcomes, such as mental health issues, among Black women is emerging, its use to understand the experiences of Black women and IPV in the Black community is limited. In this paper, we provide an overview of SWS and IPV to find intersectionality between the two among Black women, including risk factors for victimization, barriers to the usage of mental health services, strength used as a coping mechanism, religious and spiritual concerns and interventions needed for Black survivors. We argue that there is great need for more research using the SWS to understand IPV among Black women, how SWS must be integrated into cultural competency training for counselors, and policies that keep Black women who report IPV safe from incarceration.

College of the Sciences
Presentation Award Winners

Presenter: Josie Fenske, *Physics*

Mentor: Cassandra Fallscheer, *Physics*

Title: Ruanaway Stars as Possible Sources of the Elliptical Ring Structures in NGC 7538

Abstract: Two large, elliptical ring structures have been identified in the high-mass star-forming region NGC 7538. Both of the rings have a mass of ~500 solar masses. The origin of these ring structures is unknown, making this an exceptional case as we normally would see a high mass star or stellar remnant driving a ring's expansion. We investigate the possibility that a runaway O- or B-type star may have originated in or passed through the region and created either one, or both of the ring structures via stellar winds. In testing this hypothesis, we identify one candidate star that may have formed the northern ring. This star, BD +61 2408, is a B3e star with a mass of ~8 solar masses, and a surface temperature of ~20,000 K. Its position, motion, timescale, and spectral type are all consistent with the star being a candidate for having formed the northern ring structure in NGC 7538.

Presenter: Kahmina Ford, *Physics*

Mentor: Erin Craig, *Physics*

Title: Computational Model for Electromagnetic Gradient Cues Promoting Induced Growth Cone Turning

Abstract: The present study seeks to develop a computational model to investigate a method of neural regenerative treatment for neurodegenerative diseases such as Alzheimer's, multiple sclerosis, and sleep disorders. During neural development, growth cones of neurons respond to physical and chemical cues to turn and move along the correct path. After reaching its destination, the neuron connects with a neighboring nerve cell to create an intricate circuitry of neurons. Dysfunctional neural activity occurs when a neuron becomes injured or connects to a cell that is unable to receive electrical impulses. Recent studies have explored the use of near infrared (NIR) lasers to rewire neural connections and promote regeneration in damaged neurons. The electromagnetic field of a NIR laser provides a gradient to induce a repulsive and/or attractive response in the growth cone. Studies have shown that this method is highly effective for encouraging permanent turning of the growth cone, without damaging the neuron and the substrate necessary for motility. A key hypothesis of our study is that the growth cone structure interprets optical "turn signals" by growing in the direction of increasing electromagnetic field intensity. As an initial first step in predicting the success of NIR-based treatment of neurodegenerative diseases, we have created a model that defines the relationships that govern the dynamics of electromagnetic guidance cues. An expected outcome of this project

is to produce new testable predictions for neuronal response to tunable features of an electromagnetic gradient, yielding insight into the potential effectiveness of different neural stimulation strategies.

Presenter: Chao Hang Lin, *Computer Science and School of Graduate Studies*

Mentor: Razvan Andonie, *Computer Science*

Title: Waterbody Detection from Satellite SAT Images using Deep Learning

Abstract: Nowadays, Synthetic Aperture Radar (SAR) images have been widely used in the industry and the scientific community for different remote sensing applications. The main advantage of SAR technology is that it can acquire images from night time since it does not require sunlight. Additionally, it can penetrate the cloud which can capture images where the traditional optical sensor is limited. One of the remarkable applications of SAR image is water detection since the water body reflects off all the energy from the radar so it appears in a SAR image as dark pixels. The traditional way to mark out water from SAR image is using the threshold method where each pixel is classified as water when its value is below a certain threshold. This method works fine in a plain rural area but the complex features of urban areas make it more challenging, for example, highways and buildings shadows can be easily misclassified as water. To solve this problem, we propose a deep learning solution to detect water from SAR image. The implemented convolutional neural network will no only identify water by the intensity of each pixel, it also learns the spatial information of neighborhood pixels. To train the network we used so2sat dataset which is processed from Sentinel-1 satellite SAR images. After training, we tested the neural network in many real SAR images and it gave us promising results that are more clear and better than the thresholding method. Moreover, to speed up the proposed solution, we were able to update it with the convolutional sliding windows.

Presenter: Mariah Hogan, *Law & Justice*

Mentor: Robert Claridge, *Law & Justice*

Title: The Law and Social Distancing

Abstract: It goes without saying that we are in an unprecedented time, both American as well as global history amidst the COVID-19 outbreak. Of the innumerable changes the virus has affected within our lives, perhaps the most prevalent has been in the utilization of "social distancing" protocols enacted in most states, which serve to protect against the continued spread of the virus by greatly restricting our ability to gather publicly. However, despite the altruistic nature of the protocols, we have heard repeatedly stressed throughout the news and media that all have not been in total compliance. With some jurisdictions going so far as to attempt to enact policies that

would allow for fines or other modes of punishment of being found in violation of the protocols, many states and other local governments have been scrambling to do what they can to encourage mass compliance without having to go so far as to enter "shelter in place"-like orders. The purpose of this project is to evaluate the extent to which civil liability beneath a theory of negligence for persons found to be in violation of the social distancing suggesting could serve as an effective remedy to this rapidly evolving public health problem. Negligence is grounded by four key elements in civil law: duty, breach, causation, and damages. Within this project, we want to apply this framework to individuals who refuse to observe social distancing. For example, beginning with duty, we are interested in assessing where exactly it is that the threshold of duty may become implicated – such as in the enactment of social distancing orders, or perhaps even sooner. We will then continue our analysis through each of the elements of civil liability beneath a theory of negligence for individuals who violate the social distancing protocols enacted in their jurisdictions to determine if and how effective of a remedy civil law may be able to provide in the face of these confusing and tumultuous times.

Presenter: Jonah Kathlean, *Anthropology & Museum Studies*

Mentor: Lene Pedersen, *Anthropology & Museum Studies*

Title: In Our Own Skin

Abstract: Based on research of the Tlingit, a Southeast Alaskan Tribe, this short anthropological documentary showcases contemporary Tlingit artists alongside their artwork. These artists express changes among Native American identity through their various forms of art and contribute to important discussions about what it means to be Tlingit today. This mini-documentary accompanies a larger student project that was delayed due to the recent COVID-19 pandemic. This project involved exploring the community of Tlingit members to better develop an understanding of how this community is threatened by a disappearing language. With a focus on Native American visual arts to showcase the importance of expressing culture through artistic mediums, this presentation is an intermediary project, based on phone interviews with our participants, existing interview footage from principal shooting, and other stock footage. It will include an introduction of contemporary Tlingit artists and their important contributions to Tlingit identity along with other Native American tribal artists located throughout the nation. This mini-project presents an opportunity to explore outside the Tlingit community to study what kinds of symbols and patterns other tribal artists around the country are including in their artistic expressions to represent a culture. In addition to showcasing the Tlingit, other Native American artists, and their contributions to discussions about indigenous identity, this short documentary will set in motion a series of artistic collaborative meetings in preparation for the larger project and production, the People of the Tides documentary.

Presenter: Alexandra McCarrel, *Biological Sciences* and *School of Graduate Studies*

Mentor: Paul James, *Biological Sciences*

Title: Early Life History and Stock Discrimination of Kokanee Salmon (Oncorhynchus nerka) in an Alpine Lake Environment

Abstract: Kokanee salmon (Oncorhynchus nerka) are an ecologically and recreationally important species in many lakes in the Cascade Mountains. One such population that inhabits Lake Keechelus in the central Cascades of Washington state are considered a vital food base for a critically low population of bull trout in the lake. The kokanee spawn in large numbers in the lake's main tributary, Gold Creek. However, other than spawning areas, not much is known about the early life history of this population, how they interact with unique features in their rearing environment, or their natal origins (hatchery vs. wild-born). With my research I created a descriptive early life history of Gold Creek kokanee and a framework to determine the natal origin of spawning adults. Monitoring in 2019 showed kokanee that spawned in Gold Creek produced viable eggs that survived the winter, and emerged in mid-April. The majority of adult kokanee avoided spawning in Gold Creek itself, preferring a man-made outlet channel from Gold Creek Pond that had significantly higher water temperatures and a prominent beaver dam. Significantly higher densities of larvae were recorded below the beaver dam compared to upstream, with larvae emergence being episodic throughout spring months. Stock discrimination (hatchery vs. wild-born) of spawning adults is being determined by comparing early life history stages using otolith microstructure analysis. With this research, the future restoration efforts of the region can integrate the life history data of kokanee as well as quantify the potential role hatchery fry contribute to the ecosystem.

Presenter: Vanessa Montano, Leonardo Pastor, Ariel Ramos, & Jacob K. Kauhane, *Mathematics*

Mentor: Brandy Wiegers, *Mathematics*

Title: Mathematical Modelling of the United States Southern Border Migrant Camp Crisis

Abstract: As of July 2019, the United States government has reported a 66% increase in migrant children being held in immigration processing detention centers. The increase in migration without evidence based policy is causing concerns such as overcrowding, unsanitary conditions, poor living environments, and decreases in the mental and physical health of those being held in detention centers. We are interested in the financial, social, and health effects that occur in the conditions these children are in. What can math show us about what we can do to alleviate the issues occurring at these Migrant Detention Centers? We investigated the outbreaks in these facilities and determined the extent of infection by utilizing the differential equations in SIR models and analyzed the financial data to determine possible impacts on migrant children.

Presenter: Bayan Saied, *Sociology* and *Women's, Gender & Sexuality Studies*

Mentor: Griff Tester, *Sociology*

Title: Intersectional Feminism and Media Portrayals of Missing and Murdered Indigenous Women and Girls in U.S. Cities

Abstract: Living free from violence is a fundamental human right that all persons should be granted, but this is not the case for many Indigenous women in the United State (U.S.). Data from the Department of Justice (DOJ) (2008) demonstrate that Indigenous women are two and a half times more likely to be raped or sexually assaulted than other women, and Amnesty International (2007) reports that 86% of reported crimes against Indigenous women in the U.S. are committed by non-Native men. According to The National Crime Information Center, in 2016, there were 5,712 reports of missing American Indian and Alaska Native women and girls, of which, only 116 were logged in the DOJ database. In this work-in-progress, I present the statistics on media representation of missing and murdered Indigenous women and girls in 71 U.S. specified in the Urban Indian Health Institute's 2018 report and situate them in a historical and ongoing context of settler colonialism and structural inequality. I do this by using an intersectional feminist lens and controlling images, outsider within, and politics of disposability as conceptual tools.

Presenters: Mackenzie Stinson & Jazmin Gonzalez, *Anthropology & Museum Studies*

Mentor: Rodrigo Renteria, *Anthropology & Museum Studies*

Title: Coexisting Natures in the Tropical Dry Forests of Mexico

Abstract: The coastal region of Jalisco, Mexico, known for its biological diversity, is home to many endemic species of the tropical dry forest. In the heart of the forest resides the Estación de Biología, Chamela (EBCh), a biological research station administered by Universidad Nacional Autónoma de México (UNAM). EBCh is located in the Chamela-Cuixmala Biosphere Reserve, and within this region biologists work intensively to try to understand the biological dynamics and systems throughout this unique coastal ecosystem. Wherever research is produced, local knowledge, participation, and opposition often become intertwined. This intersection allows for anthropological lenses to unveil perceptions from the community of the land to the community of science, thus to ultimately understand the challenges among various stakeholders. A comparison of the perceptions of wildlife and domesticated life was conducted among farmers, biologists, and conservationists throughout the region of Chamela and Cuitzmala, Jalisco. Ethnographic accounts show that although the guarded natural lands benefit regional tourism, preservation, and conservation, the discrepancies of land use between these institutions and the public threaten the need for future integration of biological and cultural conservation.

Presenter: Brett Vagt, *Chemistry* and *School of Graduate Studies*

Mentor: Levente Fabry, *Chemistry*

Title: Two-Step Synthesis of Novel Boronates; Structural Building Blocks of Therapeutically Relevant Compounds

Abstract: Every year the number of multidrug-resistant bacteria and viruses increases, sparking a tremendous need for the development of more powerful countermeasures. Modification of current drug therapies is a short term solution, but the need for novel medicinal compounds is critical for long term defense. The use of boron-modified compounds (those containing a strategically placed boron atom), as potential antibiotics and antivirals, has been investigated and have shown potential to be powerful therapeutic agents. There are currently three boronmodified FDA approved medications, which indicates that there is tremendous potential for further discovery and development. Currently, the Fabry Research Group focuses its efforts on boron modified inhibitors of HIV-1 aspartic protease. The group's interest in the broader application of these compounds, however, extends far beyond this single virus. The goal of this project been create a diverse library of functional novel boronate analogues. All of these structures provide potential starting points or building blocks for therapeutic compounds that could aid in the fight against multi-drug resistance. The properties that make boron a powerful addition to inhibitory compounds, also provide difficult synthetic challenges. The synthesis of this novel boronate library will contribute to further understanding some synthetic limitations within boron chemistry.

Presenter: Hermann Yepdijo Nkouanga, *Computer Science* and *School of Graduate Studies*

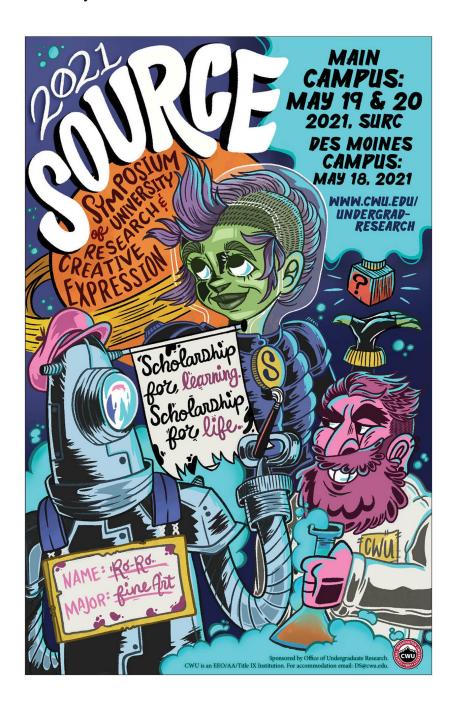**Mentor:** Szilard Vajda, *Computer Science*

Title: Automatic Tuberculosis Detection using Chest X-Ray Analysis with Position Enhanced Structural Information

Abstract: Tuberculosis is a disease responsible for the deaths of more than one million people worldwide every year. Even though the disease is preventable and curable, it remains a major threat to the humanity that needs to be taken care of. More developed countries use advanced techniques such as culture methods or sputum smear microscopy to diagnose the disease. However, since those approaches are rather expensive, they are not commonly used in poor regions of the globe such as East Asia, Africa and Bangladesh. Instead the well know and very affordable chest x-ray interpretation by radiologists is the technique employed in those places. Some of the major issues with this approach are: i) is a tedious task that requires experienced medical personnel, and ii) is performed manually which can be very painful when done for a large population. In order to accelerate the interpretation process and reduce the dependence on qualified radiologists -which is scarce it those countries, many software solutions evolved over the last few years considering computer vision, artificial intelligence and machine learning. The issue with these solutions is that they are either not reliable enough or they are rather

complicated. Therefore, we propose a fully automatic software solution that uses only machine learning and image processing to analyse and detect anomalies related to Tuberculosis in Chest x-rays images. Our system has been tested on two benchmark data collections -Montgomery and Shenzhen, and produced state-of-the-art results reaching up to 97% in accuracy.

SOURCE Poster Competition

Thank you to Dr. Justin Beckman and students in Intermediate Layout & Design (ART 371) spring quarter, 2020, for creating posters for the SOURCE 2021. The winning poster, voted on by students, was created by Alana Jacobs.

Thank you judges!

Mike Andler	Kris Ernest	Greg Lyman	Jeff Rosenberry
Razvan Andonie	Cassandra Fallscheer	Gail Mackin	Maureen Rust
Courtney Aucoin	Ping Fu	Gabrielle McNeillie	Rosemary Salter
Salam Awad	Cesar Garcia	Braunstein Michael	Maria Sanders
Gary Bartlett	Yingbin Ge	Kristine Miller	Jamie Schademan
Callie Baugher	Della Gonzales	Ian Miller	Christopher Schedler
Tishra Beeson	Brynn Harrison	Darrell Niver	Chad Schone
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Andreas Bohman	Geri Hopkins	Mike Pease	Monica Sewell
Elizabeth Brown	Vanessa Hunt	Jill Perillo Clark	Darci Snowden
Joshua Buchanan	Jill Hoxmeier	Julia Perry	Francesco Somaini
Tonya Buchanan	Jenna Hyatt	Kevin Peterson	Julia Stringfellow
John Calcitrai	Kurt Ikemeier	Holly Pinkart	Rochelle Teigen
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Patrizia Chirco	Carla Jellum	Charles Pringle	Carin Thomas
John Choi	Maribeth Jorgensen	Aimee Quinn	Brett Vagt
Erin Craig	Sabrina Juhl	Joseph Rainwater-Cummings	Szilard Vajda
Michelle DenBeste	Bernadette Jungblut	Katharine Reed	Caleb Valko
Jared Dickinson	Rachel Kirk	Bradley Reeves	Astrid Vidalon
Veronica Dimas	Jessica Krill	Cary Roberts	Steve Wenger
Andrea Eklund	Nathan Kuwada	Barbara del Mar Robles	Brandy Wiegers
Jamie Ellis	Daniel Levy	Pamela McMullin-Messier	Sara Williams
Lisa Ely	Susan Lonborg	Allyson Rogan-Klyve	