

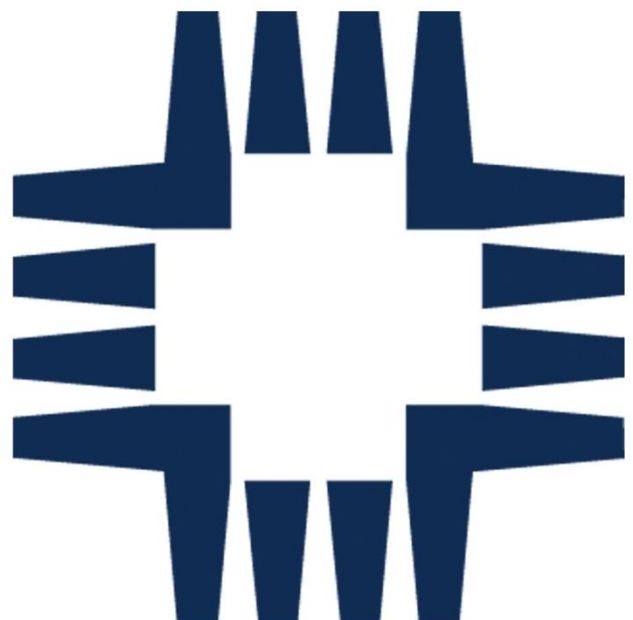


10th Annual

Academic and Research Symposium

Concordia University, Nebraska

April 2021



ACADEMIC AND RESEARCH SYMPOSIUM – PRESENTER SCHEDULE

Day	Time	Oral Sessions – Thom Room	Posters – Thom Main
Mon 4/26	3:30 – 4:30 PM	<u>Technology & Empirical - Aud</u> 1. Ethan Pankow 2. Kyndle Kirby 3. Tanner Wubbels 4. David Ehrke	
	4:30 – 5:30 PM	<u>Technology - Aud</u> 1. Jasmine Cody 2. Dalton Berry 3. Nathan Auffet 4. Andrew Haase	<u>Technology & Lit Review</u> 1. Matthew Preuss 2. Kaitlyn Radebaugh 3. Taylor Cockerill 4. Caleb Roberts 5. Faith Troshynski 6. Samantha Lyon
	5:30 – 6:30 PM	<u>Technology - Aud</u> 1. Hayden Salt 2. Matthew Preuss 3. Olivia Leising 4. Quinton Janecek	
Tue 4/27	3:30 – 4:30 PM	<u>Technology & Empirical - Aud</u> 1. Sam Weiss 2. Abigail Mullen 3. Rachel Deppe 4. Wyatt Loga	
	4:30 – 5:30 PM	<u>Technology & Empirical - Aud</u> 1. Simon Higgason 2. Mackenzie Koepke 3. Brynna Bruxellas	
	5:30 – 6:30 PM	<u>Technology & Empirical - 104</u> 1. Martha Brauning 2. Micah Willweber 3. Mackenze Origer 4. Cassandra Lopez Flores	<u>Lit Review, Technology, & Empirical</u> 1. Beau Dorman 2. Wyatt Lehr 3. Lukas Diehm 4. Trevor Dey 5. Matthew Wahlers
Wed 4/28	3:30 – 4:30 PM	<u>Technology & Empirical - Aud</u> 1. Dani Larsen 2. Logan French 3. Abigail Lyons 4. Kyle Wilshusen	<u>Lit Review, Technology, & Empirical</u> 1. Jonah Lange 2. Shiloh Richters 3. Jennika Chapman 4. Ryan Samuelson 5. Tristin Mason 6. Jodi Fry 7. Kathryn Potter
	4:30 – 5:30 PM	<u>Technology & Empirical - Aud</u> 1. Emma Hopper 2. Drew Ward 3. Luke Blumenberg & Kyle Wilshusen 4. Noah Larson	
	5:30 – 6:30 PM	<u>Non-empirical & Lit Review - Aud</u> 1. Michelle Porath 2. Jetta Tegeler 3. Jacob Garrison 4. Michael Grundstrom	
Thu 4/29	3:30 – 4:30 PM	<u>Technology & Empirical - Aud</u> 1. Rosanna Scott 2. Mario Ybarra 3. Megan Klenke 4. Colten Uitermarkt	
	4:30 – 5:30 PM	<u>Advanced Art - Aud</u> 1. Cassidy Grosserode 2. Samuel Sisco 3. Sonja Brandt	



Special Thanks

Thank you to all presenters, faculty sponsors, staff, judges, administrators, and attendees for supporting the symposium!

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Oral Session - Technology & Empirical

Monday April 26, 2021

Thom Auditorium

Modeling the 2017 Plague Outbreak in Madagascar

Ethan Pankow

3:30-3:45p

Faculty Sponsor: Brian Albright

Using Microsoft Excel, an epidemic model of the pneumonic plague outbreak in the country of Madagascar in September through November of 2017 was created. During this outbreak, a total of 2,417 cases were reported, including 209 casualties. Most of the cases (1,854) were clinically classified as pneumonic plague, 355 were classified as bubonic plague, one was septicemic, and 207 were never classified. For simplicity this model will focus on pneumonic plague. An article on sciencedirect.com had implemented an SEIR model in order to better understand the plague transmission. This modeling has long term benefits, as the plague is endemic, meaning it returns yearly due to the conditions that support rat flea populations. In this model, I attempted to fit an SIR model to the data and observed the fit and accuracy of such a model. The purpose of my model is to see whether a simpler model will also fit the data considering the more complicated nature of the SEIR model.

Crime Rates in Alaskan Cities in Relation to the Enactment of Senate Bill 91

Kyndle Kirby

3:45-4:00p

Faculty Sponsor: Joel Helmer

A perceived dramatic increase in Alaskan crime rates during the years of 2016, 2017, and 2018 is rumored to be the result of Governor Walker's highly controversial Senate Bill 91. After Governor Dunleavy repealed Senate Bill 91 in 2019 many Alaskan's claimed they witnessed a decrease in crime. With the use of ArcGIS Pro to display geospatial data, this project visualizes the crime rates within Alaskan communities and aims to determine which cities were impacted most by the enactment and repeal of Senate Bill 91.

Ghost Towns in Nebraska

Tanner Wubbels

4:00-4:15p

Faculty Sponsor: Joel Helmer

Since Nebraska was founded in 1876, there have been 23 towns that have been established and have since gone abandoned. This project provides a visual representation of the town's location in relation to railways, rivers, and other main resources throughout the state. My goal is to find a common attribute that links each town being abandoned. My data will provide a basis for future civilizations on how to start a city and keep the city running successfully based on its location.

Targeting Abortion

David Ehrke

4:15-4:30p

Faculty Sponsor: Joel Helmer

In the United States, 37% of abortions are obtained by African American women despite only making up 14% of the female population. Planned Parenthood is the largest provider of this service in the United States. This map shows the disproportionate location of Planned Parenthood abortion clinics in African American communities when compared to the rest of the United States. This could be the explanation of such high abortion rates among the African American community.



Oral Session - Technology

Monday April 26, 2021

Thom Auditorium

Blackjack Strategy

Jasmine Cody

4:30-4:45p

Faculty Sponsor: Brian Albright

In this presentation, Microsoft Excel is used to simulate the game Blackjack, to determine a strategy that maximizes winnings.

Restoring the Ancient Plains

Dalton Berry

4:45-5:00p

Faculty Sponsor: Joel Helmer

Biodiversity includes all types of plant and animal species that compose an ecosystem. In order to increase the richness of biodiversity, biomes must have ample space. Conservation of wild areas and agriculture has always been in a delicate balance. Various potential ways to increase or optimize land use for the benefit of the North American plains biome will be explored using the mapping software ArcGIS Pro. This project will analyze areas that can be restored back to natural prairie, specifically focused on the Great Plains of Nebraska.

Get Covered

Nathan Auffet

5:00-5:15p

Faculty Sponsor: Joel Helmer

I wanted to discover the coverage of BWTelcom 4G and the relationship it has with their territory. Using Arcgis tools such as Line of sight and RF I will find the percentage of territory covered in their five counties. This research will Save BWTelcom money and time by being able to eliminate customers who do not qualify.

Round Robin Scheduling

Andrew Haase

5:15-5:30p

Faculty Sponsor: Andrew Langewisch

Round-robin schedules, such as for golf leagues, can be frustrating to successfully create, whether by hand or by using an online tool. Such tools can automatically generate a valid schedule, but the formatting is often fragmented--chopped up by time period, the interface is difficult to navigate, and the solutions lack identifiable patterns. In this presentation, I will demonstrate the development of an Excel algorithm that would allow any person, regardless of technical knowledge, to enter the number of participants and create an entire condensed schedule that organizes itself in such a way as to be easy to comprehend, and the pattern will be apparent.



Poster Session - Technology & Literature Review

Monday April 26, 2021

4:30-5:30p

Thom Main Street

The Wonders of Windows

Matthew Preuss

Faculty Sponsor: Robert Hermann

I used an infrared sensor to make a thermometer that does not require contact with the surface it is measuring. The sensor measures the emissivity of a surface, which is a measure of infrared activity, as a voltage and uses software to convert that value into a temperature. I connected the sensor to an Arduino microchip processor, which I also connected to a Liquid Crystal Display to write the temperature of the object to a screen. I compared the temperature readings of the sensor to those of a cooking thermometer to ensure that they were accurate, and found they were within about 1% of the cooking thermometer. After calibrating it, I found the average distance away from a target before the sensor became inaccurate, which I used to find the angle at which the sensor reads. Finally, I used this device to measure the temperature of windows and compare that to the outside temperature in order to calculate the R-Value and see how well the windows insulate buildings.

Pilates-Based Rehabilitation

Kaitlyn Radebaugh

Faculty Sponsor: Nolan Harms

Created during the 1920s, Joseph Pilates designed a rehabilitative practice for soldiers during World War 1. The Pilates method encourages movement early in the rehabilitation process by assisting movement through spring resistance. Today, Pilates has become popular among physical therapists and those in the rehabilitative field. Researchers have begun to study how the methods in Pilates specifically aid populations such as those with low back pain, multiple sclerosis, and those in need of injury prevention or rehabilitation. Current studies indicate that Pilates statistically improves flexibility, endurance, and strength.

Female Athlete ACL Injury Prevention Through Neuromuscular Training

Taylor Cockerill

Faculty Sponsor: Nolan Harms

Neuromuscular training (NMT) is an effective form of preventative care for anterior cruciate ligament (ACL) injuries in female athletes. This training is based on the programming of muscles and nerves to work together in the most efficient way. Participating in NMT can be beneficial for female athletes because they are more susceptible to knee injuries such as ACL ruptures. Though this isn't the only method of preventing these injuries, recent research has shown a significant decrease in ACL injuries for those who participate in NMT.



Poster Session - Technology & Literature Review

Monday April 26, 2021

4:30-5:30p

Thom Main Street

Hemorheological and Neurologic Effects of Overtraining Syndrome in Athletes

Caleb Roberts

Faculty Sponsor: Nolan Harms

In today's age of intense athletic competition across all age groups, athletes commit hours to training and conditioning. Athletes who are intent on success often risk Overtraining Syndrome. While many athletes are aware that a large training volume can lead to injury, they remain unaware of the hemorheological and neurologic implications of an improper training program. Increased viscosity of the plasma and aggregations of erythrocytes are hemorheological abnormalities that lead to the sensation that many athletes refer to as "heavy legs". While the dopaminergic, noradrenergic, and serotonergic systems all factor into the neurological aspect of Overtraining Syndrome, further research is required to comprehend the full effects that neurotransmitters have on athletic performance deficiencies.

Nutrition and Elite Sport Performance

Faith Troshynski

Faculty Sponsor: Nolan Harms

Proper nutrition plays a large role in helping athletes perform at their best. Athletes are always researching for methods to gain an edge over their opponents. One of these methods is the correlation between nutrition and elite sport performance. Nutrition has a significant effect on several different components of an athlete's performance. These components include supplying sustainable energy needs, hydration, aiding in muscle repair, and providing sport specific nutrition goals that will help the athlete achieve peak performance. Research of the world's most elite athletes have found that proper nutrition enhances sport performance.

The Effects of Sedentary Lifestyles on the Brain and Skeletal Muscles

Samantha Lyon

Faculty Sponsor: Nolan Harms

A rise in sedentary lifestyles is of high concern in society today. For many years, research has been evaluating the effects that a sedentary lifestyle has on human physiology. More recent research focuses on the effects of a sedentary lifestyle on brain function and wellness, as there is possibly the belief that a sedentary lifestyle negatively affects neural pathways in the brain. Exercise, physical health, and positive lifestyle choices improve the neural functioning of the brain.



Oral Sessions - Technology

Monday April 26, 2021

Thom Auditorium

Unclogging Sydney

Hayden Salt

5:30-5:45p

Faculty Sponsor: Joel Helmer

This project look looks at trends of traffic congestion in Sydney, Australia, and how the problem of traffic congestion has been sorted out throughout the years. Using traffic flow data from the NSW data catalogue and analysing how introductions of transport networks such as railway and bike lanes have been used to reduce traffic congestion, I have mapped out the different roads including traffic flow, as well as the other transport networks using GIS to support my work. This project provides supporting evidence for the introduction of more sustainable transport networks throughout other cities.

Tricky Trebuchet

Matthew Preuss

5:45-6:00p

Faculty Sponsor: Brian Albright

I used an online app to take data on a trebuchet, modifying different variables to determine which of them is the best predictor of throwing distance. The app allows the user to change several different features of the trebuchet and provides a graphic for each trial. Recording the throwing distance for each trial, I changed one variable while keeping the others constant for 10 trials. I then started changing the next one until all 5 variables had been tested. Finally, I used regression equations to determine which combination of variables is the best predictor for throwing distance.

Using Revised Universal Soil Loss Equation to Evaluate Erosion Rates and Management Practices on Arable Land in Furnas and Gosper County, Nebraska

Olivia Leising

6:00-6:15p

Faculty Sponsor: Joel Helmer

Balancing environmental sustainability and agricultural productivity is an essential challenge to the global agricultural community. Soil erosion is a geological process that has hastened the degradation of arable lands and annually costs the US \$44 billion in productivity losses (Eswaran, 2001). Proper land management and conservation practices can reduce production losses and sustain the environment. With the use of ArcGIS software and RUSLE (Revised Universal Soil Loss Equation), this project illustrates current soil erosion rates on selected agricultural land in Furnas and Gosper Counties. The effects of incorporating the use of additional conservation practices are also simulated.

Spatial Distribution of Museums in Nebraska

Quinton Janecek

6:15-6:30p

Faculty Sponsor: Joel Helmer

This study is designed to show the number of museums in Nebraska, to identify the types of museums, and to assess the prominence of these types in different areas of the state. This research is relevant to discover if there is a pattern in the museum layout in Nebraska, to identify the types of museums most commonly found in the state, and which area of the state each is most often found.



Oral Sessions - Technology & Empirical

Tuesday April 27, 2021

Thom Auditorium

Battleship Probability Simulation

Sam Weiss

3:30-3:45p

Faculty Sponsor: Brian Albright

Using Excel, I will compare two common strategies used in the board game Battleship. The first is randomly guessing, and the second is going along the diagonals. One battleship will be randomly placed on a board, and the two strategies will be compared to one another to see how many misses it takes to get a hit.

Ragbrai Town Frequencies and Economic Future Route Map

Abigail Mullen

3:45-4:00p

Faculty Sponsor: Joel Helmer

Ragbrai is an annual bicycle ride which passes through different selected overnight towns in Iowa across the state. These overnight towns receive an economic benefit from this ride. Using ArcGIS, I created a map of the overnight towns used for Ragbrai and created a display of how frequently Ragbrai stopped in each town. While the map shows the overnight locations, it also shows locations where it has not been. This allowed me to craft a potential route which incorporates towns which could benefit from it.

Caffeine and Anxiety

Rachel Deppe

4:00-4:15p

Faculty Sponsor: Sara Brady

Research has shown that caffeine can actually raise anxiety levels. Symptoms of anxiety can include nervousness, shaking in the hands, tingling, difficulty breathing, unable to relax, and heart racing to name a few from the Beck Anxiety Inventory (Beck et al., 1988). There had been quite a few studies on this topic already, but they all have a wide age range. This one focused on college students. This study will be done on anxiety induced by caffeine among college students. Students who are in college completed this study by recording the amount of caffeine they consumed in a day, and at the end of the day, they recorded their anxiety symptoms to see if caffeine raised his/her anxiety levels.

Cowboy Up: Statistical Analysis of Where NFR Participants Come From

Wyatt Loga

4:15-4:30p

Faculty Sponsor: Joel Helmer

NFR cowboys come from all across the United States and the world. Stephenville, Texas promotes itself as the cowboy capital of the world. By taking NFR qualifiers from 2010-2019, which have 9 event groups and 15 per event each year, I identified where these cowboys and cowgirls were coming from. Using the region, state, county, and city the participants were from, I found where the true cowboy capital of the world is located. I was also able to show which US areas provided the most qualifiers and world titles.



Oral Session - Technology & Empirical

Tuesday April 27, 2021

Thom Auditorium

Using Multi-Variable Regression Analysis to Predict the Average Driving Distance of Professional Golfers

Simon Higgason

4:30-4:45p

Faculty Sponsor: Brian Albright

Multi-variable regression analysis is a statistical tool that is used to identify predictor variables which provide insight into predicting a particular outcome. For my project I used multi-variable regression analysis to identify key factors that would lend insight into predicting the average distance a series of professional golfers can drive a golf ball. The predictor variables that I tested were the age, weight, and height of the individual golfers.

How Multidimensional Perfectionism Affects an Athletes Performance and Burnout Rate

Mackenzie Koepke

4:45-5:00p

Faculty Sponsor: Sara Brady

Perfectionism is a multidimensional personality trait characterized by extremely and sometimes overly critical evaluations of one's own performance. Previous research has only focused on athletes' sport performance in relation to perfectionism. In my study, I examined athletes at a level where academics and athletics are of equal importance to see if the high demands and perfectionistic strivings of both areas are associated with an increased burnout rate. The purpose of this study was to examine student athletes on Concordia Universities campus and see if they are experiencing burnout and stress partially because of multidimensional perfectionism. Participants in my study took a series of surveys that asked them about their personal experiences with perfectionism, stress, and burnout.

The Future of Seward: A spatial analysis of Plum Creek Trail

Brynna Bruxellas

5:00-5:15p

Faculty Sponsor: Joel Helmer

Two point seven mile Plum Creek Trail is a major asset to Seward, Nebraska. In 2019, a grant was given to the City of Seward, which has been allocated toward expanding the current trail to a 7.5 mile trail that encompasses Seward. Additionally, through the grant and sponsorships, various amenities to the trail will be added. The information, which includes maps, drone footage, and research will make it apparent that the expansion and addition of amenities will accentuate the existing trail and improve the city of Seward.



Oral Session - Technology & Empirical

Tuesday April 27, 2021

Thom 104

An analysis of access to USA protected areas

Martha Brauning

5:30-5:45p

Faculty Sponsor: Joel Helmer

The purpose of this project is to show where USA protected areas or parks are and compare where they are located against populations of areas to determine if there are any areas that are lacking access to parks. The map has multiple layers of parks, populations, and access to parks. This map helps determine where there might be a lack of parks and access to the outdoors.

Hometowns of Seward, NE Fourth of July Race Participants (2009-2020)

Micah Willweber

5:45-6:00p

Faculty Sponsor: Joel Helmer

As part of Seward, Nebraska's annual Fourth of July festivities, the Seward Optimist Club holds two-mile and ten-kilometer running races. In this project, I map the spatial distribution of the hometowns of runners who participated in these races from 2009 to 2020. I examine the spread of race participants both in-state and out-of-state as well as explore the change in spatial distribution over time.

Spatial Analysis of Forest Fires in Alaska

Mackenze Origer

6:00-6:15p

Faculty Sponsor: Joel Helmer

The state of Alaska has a total land area of 571,951 square miles. Over 35% of this is forest, and so wildfires are a very real concern. When considering the underlying cause of these destructive forces of nature, there are a multitude of factors to take into account such as rainfall, human activity, and pests like the spruce bark beetle. This study analyzes the effect these have on wildfires and how they spread.

Long Term Effects and Differences between First-hand and Second-hand Trauma

Cassandra Lopez Flores

6:15-6:30p

Faculty Sponsor: Sara Brady

Previous research has examined people's personal experiences with trauma (Bolton, et al., 2004). However, few studies have examined the experiences of those who are a witness to the trauma of others. This study aimed to examine anxiety levels and the type and frequency of traumatic events experienced personally, as well as observed in close others. Individuals who were 19 years old with no prior diagnosis of a severe mental disorder took part in a survey that measured trauma frequency and current anxiety levels. Participants answered questions about themselves (i.e., firsthand experiences), as well as a close significant other (i.e., secondhand experiences). Results and implications of the study will be discussed.



Poster Session - Literature Review, Technology, & Empirical

Tuesday April 27, 2021

5:30-6:30p

Thom Main Street

Mental Health of College Athletes When in Season

Beau Dorman

Faculty Sponsor: Nolan Harms

Mental health is a large issue within the world, as of late it has been a big topic to talk about and modern medicine has been developed to help with some of these issues. But when it comes to some of the most stressed-out people it gets little recognition. I am talking about college athletes. College athletes are dealing with going to school for about 8 hours a day to then go to vigorous practices that push their bodies to the limit. Students alone are stressed out but add in a sport can push them over the edge. Research shows that College Athletes are being diagnosed with many different disorders due to their lifestyle (anxiety and panic disorders). Mental health in college athletics is a huge issue that needs its time in the light.

Perceptions of the Deaf Community

Wyatt Lehr

Faculty Sponsor: Sara Brady

The purpose of this research was to test and see if an educational intervention will affect stigma towards the Deaf Community. It was hypothesized that educational intervention on the culture of Deaf persons will lessen stigma towards the Deaf Community. In the experiment, Concordia college students above the age of 19 assessed their stigma towards the Deaf Community. The control group received an article with no information about the Deaf Community, and the experimental group received an article that had information regarding the Deaf Community. A t-test was used to analyze a possible significance between the two groups in regards to stigma. Results and implications of the experiment will be discussed.

Sleep Deprivation and its Effects on Athletics

Lukas Diehm

Faculty Sponsor: Nolan Harms

Sleeping is a very important aspect of health and life and is especially important for athletes. We see this aspect of physical wellness is often neglected by College Students due to multiple factors such as schoolwork, social life, extra curriculars, etc. Sleep affects multiple areas of athletic performance including recovery, biomechanics, stamina, and reaction time. Research shows time and time again that this low hanging fruit has profound effects on performance in athletics as well as detrimental effects when not receiving enough.

The Effects of Sleep on Athletic Performance

Trevor Dey

Faculty Sponsor: Nolan Harms

Today's athletes utilize various methods to maximize their performance from the smallest details within their diet to advanced biomechanics evaluation. However, one of the best performance boosters may be sleep. Proper sleep and regular sleep-wake patterns have shown positive effects on recovery, injury prevention, reaction time, and competition anxiety within athletes. Poor sleep habits have shown negative effects on athletic performance. Research suggests that having a proper amount of sleep and regular sleep-wake patterns can prove to positively enhance athletic performance.



Poster Session - Literature Review, Technology, & Empirical

Tuesday April 27, 2021

5:30-6:30p

Thom Main Street

Lutheran Schools in the California-Nevada-Hawaii LCMS District

Matthew Wahlers

Faculty Sponsor: Joel Helmer

In this project, I studied and mapped out some information regarding Lutheran schools in the California-Nevada-Hawaii LCMS district, where my dad works. I took a look at some demographic and other information of schools, the distribution of where schools are, and used some directories from a couple schools to see the distribution of where students live and how far they live from the place they go to school.



Oral Session - Technology & Empirical

Wednesday April 28, 2021

Thom Auditorium

Physical Activity and Exercise and Its Effects on Mental Health in Quarantine

Dani Larsen

3:30-3:45p

Faculty Sponsor: Sara Brady

COVID-19 has led to an increase in isolation, which has been linked to a rise in individuals' levels of depression, anxiety, and stress (Duncan et al., 2020). Many studies have shown how physical activity and physical exercise can have a positive impact on mental illness (Amatriain-Fernández et al., 2020; Bray & Born, 2004), but no research relating to mental health and physical activity in isolation due to exposure of COVID-19. This study looked at whether or not there was a correlation between individual's mental state (i.e., levels of their depression and anxiety being high or low) and how often they were engaging in moderate to vigorous physical activity/exercise after being in quarantine due to exposure to COVID-19.

The Geographical Distribution of Overwatch Players

Logan French

3:45-4:00p

Faculty Sponsor: Joel Helmer

The purpose of the study was to explore the Geographical distribution of Overwatch players. Overwatch is a videogame recently adopted by CUNE's Esports team which features 6v6 team fighting and over 25 individual characters. The project maps members of the playerbase who responded to a survey with the goal of visualizing various characteristics such as preferred roles, characters, or game modes in a geographical context.

Distribution of the Harbison's Dun Skipper and Influential Ecological Factors in San Diego County

Abigail Lyons

4:00-4:15p

Faculty Sponsor: Joel Helmer

The Harbison's dun skipper is isolated in the riparian oak woodland forests near San Diego, California. Species survey analysis, along with location analysis of the host plant, *Carex spissa*, were performed to determine possible locations of populations of the skipper. Additional factors, such as conserved land and nectar sources, were evaluated to determine other ecological influences that affect habitat and population locations. This analysis provides insight into the importance of conservation of local habitats for the support of the Harbison's dun skipper.

Falconry Laws in the United States

Kyle Wilshusen

4:15-4:30p

Faculty Sponsor: Joel Helmer

Falconry is the sport of using a trained raptor to hunt game. Since all species of raptors are protected by federal law, regulations have been put in place to protect wild raptor populations and to ensure that falconry raptors will be properly cared for and managed. Laws regulating falconry are in place at the federal and state levels. This project investigates the falconry laws for every state and uses GIS mapping techniques to compare laws on maps as they vary between states.



Poster Session – Literature Review, Technology, & Empirical

Wednesday April 28, 2021

3:30-4:30p

Thom Main Street

Broader Horizons: How Participation in a Variety of Extracurricular Activities in High School affects Career Choice

Jonah Lange

Faculty Sponsor: Sara Brady

This study examined if a variety of extracurriculars in high school leads to less major changes in college. Participation in extracurriculars can help a student's development in many ways (McNeal, 1999). Despite this research on extracurriculars, few studies have examined the effect of extracurricular variety and its benefits. The purpose of the proposed study was to determine if there is a correlation between variety of high school extracurriculars and the number of major changes in college. Upper-level students from Concordia University Nebraska participated in a survey about high school extracurricular experiences and their college major. Results of the study will be discussed.

Death of the Small-Town West (Nebraska Population Shift: 1920 - 2010)

Shiloh Richters

Faculty Sponsor: Joel Helmer

Growing up in rural Nebraska it was clear, populations are shifting away from small town communities. Unsurprisingly, the state legislature recently reported nearly all of Lancaster County Districts are in the upper half of population rankings with the panhandle being in the lowest. Using ArcGIS Pro to map how Nebraskan populations have moved is key to understanding when and where in order to fully clarify why. Conclusively, this research illustrates a significant shift in Nebraska populations from rural communities throughout the last century hinting at further uncertainty in the future of American agriculture.

The Mutually Beneficial Outcomes of Early Mobility Acute Physical Therapy in Inpatient Hospital Settings

Jennika Chapman

Faculty Sponsor: Nolan Harms

Prolonged bed rest, while once viewed as an essential contributor to recovery has now been identified with poorer recovery results. In recent years, a trend has emerged to administer an early mobility protocol in acute inpatient settings. Some find that implementing this protocol will be difficult due to limited resources, equipment, and the demand that it would place on staff. The purpose of this project is to analyze the current research trends of early mobility in acute hospital settings and the implications on post-operative functional capacity. The research shows that the implementation of this protocol will yield mutually beneficial results for both the patient and the hospital. Through various studies the research has revealed that those who have had engaged in early mobility protocols have experienced decreased hospital costs, decreased hospital readmissions, and increased post-operative functional capacity.



Poster Session – Literature Review, Technology, & Empirical

Wednesday April 28, 2021

3:30-4:30p

Thom Main Street

A review of the effectiveness of dry needling as a method of pain management in individuals with myofascial pain syndrome

Ryan Samuelson

Faculty Sponsor: Nolan Harms

Dry needling is a method of pain management that, while having been a known technique for a considerable amount of time, has received growing attention recently for its ability to decrease pain created by conditions such as myofascial pain syndrome. Physical therapists who have been trained to practice dry needling use nothing more than alcohol swabs and thin stainless-steel needles to help patients decrease their perceived pain by targeting myofascial trigger points. Dry needling is a nonpharmacological pain management method, which makes it especially attractive to individuals who are eager to avoid some of the negative side effects that can come along with pharmacological treatments. This technique also gives therapists a tool to relieve pain in areas that are hard to stretch, manipulate or otherwise exercise.

Occupational Therapy and Sleep

Tristin Mason

Faculty Sponsor: Nolan Harms

Sleep is beneficial to have a good quality of life. If we do not sleep, we will not be able to function correctly, and occupational therapy can help things as little as this. You do not have to have a traumatic event to get in contact with an occupational therapist.

The Effects of ADHD in Athletic Performance

Jodi Fry

Faculty Sponsor: Nolan Harms

This research project focuses on a developmental disorder, attention-deficit/hyperactivity disorder (ADHD), and its impact on athletes' sports performance. In this project, I will talk about the signs and symptoms of ADHD, the medications used to treat it, and the effects ADHD has on athletes' cognitive and physical function. Individuals with ADHD can benefit from sports participation by improving social deficits, elevating mood, and increasing motivation. In elite athletes, sports activity has been shown to reduce the frequency of ADHD symptoms. However, common comorbid conditions in ADHD, such as depression, anxiety, and oppositional disorders, can impair athletic performance. Individuals with ADHD have normal implicit learning performance but a lower efficiency of inhibiting incorrect responses in implicit sequence learning. This could explain why some elite athletes make the same type of error repeatedly in complex sporting situations. ADHD management may have an impact on elite athletes' safety performance and should aim to focus on long-term outcomes relevant to elite athletes' sport and life.



Poster Session – Literature Review, Technology, & Empirical

Wednesday April 28,

2021:30-4:30p

Thom Main Street

Personality and Judgement Accuracy

Kathryn Potter

Faculty Sponsor: Sara Brady

The purpose of this study was to determine the rate at which people create judgment biases based on the relationship of two people, who are actual twins (targets). The targets submitted a self-evaluation of their personalities and a completed personality measure. After, undergraduate students were randomly assigned to three different groups with each group receiving the self-evaluations from the targets, labeled as either a set of twins, a set of strangers, or no information. Participants then completed the same personality evaluation for each target personality self-evaluation. All personality results were measured and compared to that of the targets to determine the rate at which relationship labels create judgement bias. Results and implications will be discussed.



Oral Session - Technology & Empirical

Wednesday April 28, 2021

Thom Auditorium

Positive Sibling Relationships and their Impact on College Adjustment

Emma Hopfer

4:30-4:45p

Faculty Sponsor: Sara Brady

Past research has shown that positive sibling relationships benefit adolescents as they grow and develop (Kumar et al., 2015). It has also shown that sibling affection predicts adolescent behavior outcomes and, more specifically, increases prosocial behaviors (Harper et al., 2016). However, minimal research has been conducted on how sibling relationships may impact adolescents as they enter and transition into college. This study aims to examine whether or not there is a relationship between sibling relationship quality and college adjustment among adolescents. It is expected that positive sibling relationships will be associated with better college adjustment in adolescents.

Coffee Production & Trade: The Production of Coffee and its Impact on the Global Market

Drew Ward

4:45-5:00p

Faculty Sponsor: Joel Helmer

Coffee is the second largest traded commodity across the globe. This presentation shows a spatial representation of the production of coffee as well as imports and exports by country. You will observe the trend of the coffee growing region known as the "Bean Belt" and how this impacts the global market. After spatial analysis of data from the World Coffee Organization, this presentation will provide you an understanding of where coffee is produced, and how it makes its way through the global economy.

Comparison of Chemotaxis in *Physarum polycephalum* Toward Natural Sugars and Non-Caloric Sweeteners.

Luke Blomenberg & Kyle Wilshusen

5:00-5:15p

Faculty Sponsor: Connie Callahan

The slime mold *Physarum polycephalum* is a multinucleated, unicellular protist that exhibits problem-solving capabilities. The slime mold is capable of foraging toward food sources and migrating away from harmful substances. Previous studies have demonstrated that *Physarum polycephalum* occasionally moves along a chemical gradient (chemotaxis) toward non-nutritional substances. In this experiment, we examined the chemotaxis of *P. polycephalum* as it relates to several carbohydrates (glucose, sucrose, fructose, and maltose) and non-caloric/artificial sweeteners (stevia, saccharin, and sucralose). The experiment determined how frequently *P. polycephalum* forages toward nutritional or non-nutritional substances, which can prompt further research into the enzymatic metabolism of *P. polycephalum*, as well as chemical structures that may account for similarities and differences in chemotaxis.

Baseball Simulation

Noah Larson

5:15-5:30p

Faculty Sponsor: Brian Albright

I used excel simulations to simulate a very simplified version of baseball innings to try and find the average amount of bases earned in an inning



Oral Session - Non-empirical & Literature Review

Wednesday April 28, 2021

Thom Auditorium

Bridging the Gap: A Proposed Study Addressing the Literacy Gap Between Middle and High School

Michelle Porath

5:30-5:45p

Faculty Sponsor: Keith Kerschen

Researchers have found that, as students transition from middle to high school, they struggle to meet the expectations of their instructors, specifically with regard to their reading and writing abilities. Upon entering high school, students frequently struggle to articulate their thought processes, both orally and written, in a clear and well-rounded manner. This phenomenon, hereafter referred to as the "literacy gap," is not without possible solutions. With an understanding of the ELA standards at the eighth and ninth grade levels, I will share how a unit plan utilizing research-based best practices related to teaching argumentative essays might aid in minimizing this literacy gap.

The Correlation Between Poverty and Juvenile Crime

Jetta Tegeler

5:45-6:00p

Faculty Sponsor: Kathy Miller

Research has shown that poverty is positively correlated with juvenile crime. There are multiple factors for this correlation including deprivation, stress, stigma, environment, among other things. I plan to address some of these factors and how by analyzing its correlation with poverty juvenile crime can be prevented.

A Christian Understanding of Pleasure: As evident in T. S. Eliot's *Four Quartets* and "The Idea of a Christian Society," Dante Alighieri's *The Divine Comedy*, and Søren Kierkegaard's "Anxieties of the Heathens" from *Christian Discourses*

Jacob Garrison

6:00-6:15p

Faculty Sponsor: Gabriel Haley

People in modernity are overwhelmed with cheap, easy pleasure. From porn to junk food, there is no lack of pleasure, and overindulgence is often defended with the answer, "I am going to die someday, might as well enjoy my time," or is not recognized at all. Dante Alighieri's *The Divine Comedy*, T. S. Eliot's *Four Quartets* and "The Idea of a Christian Society," and Søren Kierkegaard's "Anxieties of the Heathens" from *Christian Discourses* take up this "problem of pleasure." These Christian works of literature and theology define pleasure and demonstrate how a Christian handles it. A pleasurable life is a purgatorial life; it shows heaven and shuns hell.

Never Say Never Classroom

Michael Grundstrom

6:15-6:30p

Faculty Sponsor: Lorinda Sankey

Carol Dweck presents a fixed mindset as an unchanging point of view. The use of the word "never" creates this roadblock. The roadblock leads to a very limited perception of reality. Children and teachers that exhibit a fixed mindset can be detrimental to the learning process. A growth mindset can set up a classroom for success. We apply a growth mindset through the "Lutheran Learning Environment Plan" from EDUC 362 Teaching the Christian Faith to a Lutheran classroom. Information and work from EDUC 210, 346, and 431e will be used to enrich the discussion of a growth mindset.



Oral Session - Technology & Empirical

Thursday April 29, 2021

Thom Auditorium

Music Versus Nature Recordings and Their Effects

Rosanna Scott

3:30-3:45p

Faculty Sponsor: Sara Brady

Do young and professional musicians still battle Music Performance Anxiety (MPA)? Studies revealed that the symptoms of MPA and its negative characteristics, such as the lack of attention and perfectionism, affect performers during their performances (Diaz, 2018, Khalsa et al., 2013). Thus, psychologists discovered interventions that involved manipulating audio stimuli to enhance the performers' focus and attention skills. However, little research has done to see whether one audio stimulus is more effective in reducing MPA than the other. This study aimed to examine whether one is more effective than the other in improving MPA reduction for musicians prior to their performances. Participants who were currently involved in some form of music performance either listened to recorded music or nature sounds before a solo performance and then answered a post-intervention questionnaire about their current level of anxiety. Results and implications will be discussed.

Determining Profit from Changing Demand of Skin Product

Mario Ybarra

3:45-4:00p

Faculty Sponsor: Brian Albright

Skin products can shock some people with how expensive they are. Have you ever wondered how much profit, if any, a business can make from selling these products? This Excel spreadsheet shows the other factors that determine if a business makes a profit from doing so.

Flood Plain Analysis of Southeast Nebraska Farm

Megan Klenke

4:00-4:15p

Faculty Sponsor: Joel Helmer

This project analyzed the percentage of cultivated land and pasture lands within the flood plain of a farm located on the West Fork Big Blue River. This research shows what percentage of cultivated land and pasture land that is located in the flood plain. From this information, decisions about land usage and future development of the farm can be informed based on the results of this research.

Behind the Flight

Colten Uitermarkt

4:15-4:30p

Faculty Sponsor: Joel Helmer

Canada geese are often banded to study their migration paths as well as study mortality rates over the course of a hunting season. Using data acquired from the Iowa Department of Natural Resources, this study will look at the locations of Canada geese where they were banded versus reported. The data goes back six years and will look at the relationship between the number of geese banded to the number of geese that have survived. The migration path will also be displayed based on the reports given to the Iowa Department of Natural Resources.



Oral Session - Advanced Art

Thursday April 29, 2021

4:30-5:30p

Thom Auditorium

Within Without

Kassidy Grosserode

Faculty Sponsor: Aaron Nix

My research has focused on the internal and external relationships of the female body and has resulted in works that utilize pockets and orifices, such as pillowcases, plastic bags, and tubes. These mediums are important because of their connection to the history of domesticity and maternal originations, as well as my own gender and physicality. Processes represented in this body of work include sewing, knitting, folding, and layering. Although monotonous and systematic, these processes connect me to women from history and cause me to reflect on my role as a woman in today's society.

Presentation on Patris Corde, A Father's Heart

Samuel Sisco

Faculty Sponsor: Seth Boggs

My presentation is on my BFA thesis show, on display in the Marxhausen Gallery from April 19th to May 5th. My BFA thesis is a visceral, contextually rich, presentation of the apostolic letter Patris Corde, a letter written by Pope Francis and released by the Vatican on Dec 8th, 2020. The letter is a reflection on the life of St. Joseph and his role in Jesus Christ's life. My work includes a series of silkscreen prints and a hand bound version of the text. The work exists so that people might know Joseph, Guardian of the Redeemer, in a more personal way, so in turn they might grow closer to his son. The presentation will be a discussion on my work and its importance for Christians.

The Connection Between Art and Science

Sonja Brandt

Faculty Sponsor: Don Robson

I will present on my BFA thesis work, which explores similarities between art and science with focus on how observation is important to both fields.