2020

UNIVERSITY of WISCONSIN Superior

Summer Undergraduate Research Program

A partnership between the UW-Superior Foundation and the Office of Undergraduate Research, Scholarship, and Creative Activity

UNIVERSITY of WISCONSIN SUPERIOR FOUNDATION, INC.

Introduction

Well it has been quite a year!

In January, the University of Wisconsin-Superior Foundation accepted a major gift from the Swenson Family Foundation to establish an endowment fund for the Summer Undergraduate Research Program. Jim and Sue Swenson's initial vision for a student-driven summer research program and their ongoing support for the students and mentors has provided the backbone for UW-Superior's program since it began in 2012. We can't thank the Swensons enough for this generous gift to sustain the program into the future.

Student proposals for the 2020 summer program arrived in early March, only shortly before the announcement of an extended spring break, transition to distance learning and shelter at home orders disrupted the spring semester. Although the program launch was slightly delayed during the COVID-19 pandemic, student projects largely proceeded on schedule. The Summer Undergraduate Research Program provided a particularly important source of funding for UW-Superior students during this COVID-19 year, when sponsors across the country that typically provide summer internships, research experiences and jobs were forced to shut down programs due to safety concerns. While many campuses saw reduced levels of participation in summer research, this was not the case at UW-Superior. There was a high level of interest from students and we received proposals for projects that could proceed remotely, including some that relied on databases and other resources that could be accessed online, creative projects and others that focused on the coronavirus and its impacts. Step by step, we made the transition to a fully online program, from orientation to the virtual symposium in October.

The cohort this year included 18 students, four first-time mentors, and two projects with the Lake Superior National Estuarine Research Reserve. Student projects were split between 200-hour fellowships and smaller, developmental (100-hour) projects. Students and mentors alike were required to draw upon reserves of flexibility, creativity and patience as we faced new challenges (and also some opportunities) during this time. As you will see in the projects they completed, they were up to the challenge.

Thank you to this year's proposal review team of Mickey Fitch-Collins, Amy LaRue, Rick Moran, Shanna Nifoussi, Mimi Rappley-Larson, Jodie Riek, Nicholle Schuelke, Emily Schoenborn and Shevaun Stocker for their important behind-the-scenes role reading proposals and providing input to shape successful student projects. Special thanks to program associates Emily Schoenborn and Mikayla Haynes for their support of both students and I during this eventful year.

Julie O'Leary
Director, Office of Undergraduate Research, Scholarship, and Creative Activity

Summer Undergraduate Research Program Participants

Fellowships (200-hour projects):

Quadruped Robot

Hung Cao

Mentor: Dr. Sergei Bezroukov

Finding Freedom on the Seven Seas: A Gender Studies Analysis of Portraits of Female Pirates, 1600-1900

Kayless Chalmers

Mentor: Dr. Hilary Fezzey

Renewable Energy Investments in the Twin Ports Area: Are Superior and Duluth Prepared for a Sustainable Energy Future?

Sudarshan Choudhury

Mentor: Dr. Sakib Mahmud

Building and Characterizing a Spectrometer

Samuel Dettle

Mentor: Dr. Peter Cook

Historical Concentrations of Polycyclic Aromatic Hydrocarbons and Persistent Organic Pollutants in Superior, Wisconsin

Karsyn Doughty

Dr. Lorena Rios Mendoza

What Makes a Home: The Importance of Architectural Preservation Illustrated Through Children's Literature

Sonia Fields

Mentor: Anne Dugan

Ash Glazes

Amy Hightshoe

Mentor: Michael Maguire

Exploring the Perceptions of Foster Parents about Mental & Emotional Well-Being

Sameena Knopik

Mentor: Dr. Allison Willingham

Likeness: An Exploration of Gender Dysphoria and Non-Binary Identity in Poetry

Liam Strong

Mentor: Julie Gard

Evaluating the Efficacy of Restorative Justice Practices in St. Louis County's Zero to Three Safe Babies Court Initiative

Elliana Waring

Mentor: Nathan LaCoursiere

The Improvised Concerto Cadenza: Historical Context for Contemporary Performers

Eliza Wilson

Mentor: Dr. Erin Aldridge

Developmental Awards (100-hour projects):

Investigating Reading Achievement in Rural and Urban Minnesota

Jon Bartczak

Mentor: Dr. Jodie Riek

From Cultural Appropriation to Cultural Appreciation in a Globalized World

Ines Benkhfallah

Mentor: Dr. Ephraim Kotey Nikoi

The Influence of COVID-19 on Small Businesses in the Twin Ports

Sajid Hasan Chowdhury

Mentor: Dr. Praopan Pratoomchat

Comparative Study of SARS-CoV-1 and SARS-CoV-2 Virus

Mingma Sherpa Hoel

Mentor: Dr. Shanna Nifoussi

Vaping and Stigma at UW-Superior

Brandon Olson

Mentor: Dr. Deborah Augsburger

Investigating the Practical Use of in situ Chlorophyll-a Sensors to Monitor Algae in the St. Louis River

Staci Reynolds

Mentor: Hannah Ramage

Initiating a Visual Lake Levels Documentation Project

Sara Rybak

Mentor: Karina Heim

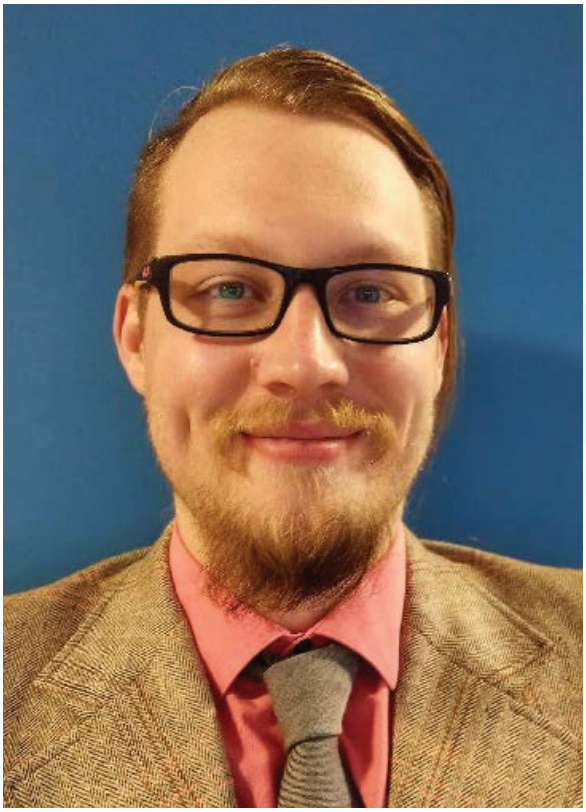
Investigating Reading Achievement in Rural and Urban Minnesota

Jon Bartczak
Mentor: Dr. Jodie Riek

Jon Bartczak grew up in the small town of Holyoke, Minnesota, about an hour south of Duluth. He attended a very small school and that experience led him to his research topic. Jon wondered if there was an advantage or a disadvantage to attending a small school. His project looked for a correlation between school enrollment size and student reading achievement data.

Jon used data from Minnesota to compare reading achievement with enrollment size for five urban and five rural schools. Jon's initial findings were that, for the schools he looked at, there was a definite drop in reading achievement from elementary to secondary in both rural and urban schools. The urban schools started out much lower in reading achievement than the rural schools, and this initial low performance hindered their overall performance. Rural schools performed higher in every distribution – overall school district, elementary, and secondary groupings. Further research is needed to better understand the drop-in achievement both the rural and urban schools have in reading from elementary to secondary schools.

Jon came to UW-Superior to complete his education degree because he had enjoyed attending previously and felt comfortable returning. Upon graduating, he plans to teach in a small rural school district.



"The funding afforded me the opportunity to focus my time and energy into my project and my summer classes."

From Cultural Appropriation to Cultural Appreciation in a Globalized World

Ines Benkhelfallah
Mentor: Dr. Ephraim Kotey Nikoi

Ines Benkhelfallah was encouraged to tackle her research project on social media and its relationship to cultural appropriation by one of her communications instructors, who saw how passionate Ines was about the topic. She conducted a literature analysis, followed by a content analysis on various social media platforms. Working on this topic was eye-opening for Ines and showed her that different cultures have different rites, traditions and ways of perceiving cultural appropriation. She learned that cultural appropriation happens in many ways, and isn't polarized, but rather, a spectrum. She found the most interesting part of her research to be identifying the pathway from cultural appropriation to cultural appreciation.

Ines is an international student from France and comes from an Algerian family background. She came to UW-Superior for the opportunity to study abroad, and to get out of her comfort zone and challenge herself. Ines is a senior communications major, and continued her research on cultural appropriation during the fall semester as part of her senior capstone project.

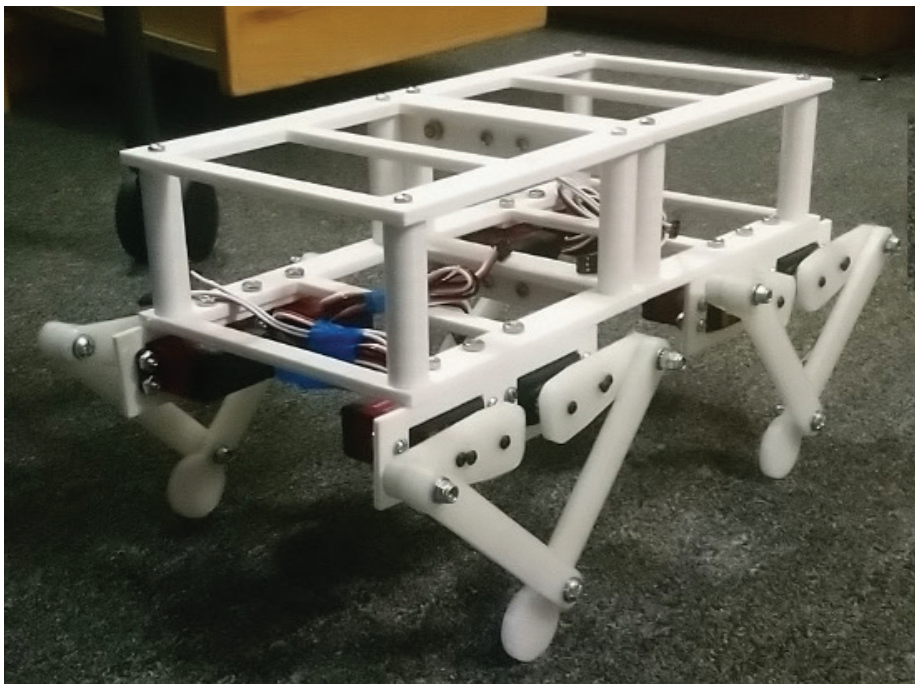
"The Summer Undergraduate Research Program stimulated me to work independently, but under the guidance of a knowledgeable faculty member who gave me the freedom to choose the shape and form of the project while still helping me be focused and structured. I enjoyed my summer research project and wish I had done it during previous summers as well."

Quadruped Robot

Hung Cao
Mentor: Dr. Sergei Bezroukov

Inspired by the movement technology of a four-legged or quadruped robot, Hung Cao set out to build one as his research project. In recent years, research and development on quadruped robots has focused on improving their performance in off-road situations. Hung used his knowledge of trigonometry and physics to analyze the movement of four-legged animals. Then, with his knowledge of microprocessor programming, he transformed theories and formulas to create a robot that could work flexibly. The quadruped robot can operate on different types of terrain, including rocky, slippery and muddy conditions. Hung's robot performed well in early trials, but it will take time to be fully developed for practical use. Hung believes this new technology is extremely effective and he plans to continue work on his project.

Hung is a sophomore majoring in computer science. He is from Vietnam and moved to Superior to attend school two years ago. Hung was drawn to UW-Superior for its outstanding computer science program and the affordable cost of studying here. He is very happy to be involved in researching a new technology and hopes to contribute to its development.



Hung's robot takes its first "steps."

Finding Freedom on the Seven Seas: A Gender Studies Analysis of Portraits of Female Pirates, 1600-1900

Kayless Chalmers
Mentor: Dr. Hilary Fezzey

The history of pirates is vague, and pirate-inspired literature is uncommon; even more rare is writing about female pirates. Kayless Chalmers analyzed existing records, poetry and novels to examine how female pirates freed themselves from restrictive gender and sexual norms of society by seeking a life of piracy during the Golden Age of Piracy. Kayless found that while early pirate literature depicts pirates as traditionally masculine, representations of female pirates undermine these images. In their success and deviation from society, female pirates grasped freedom and attained more than average women would have in the patriarchal society of their age. Kayless found it stimulating to research historical figures in piracy, since they are mostly affiliated with fantasy.

Kayless, a senior, has been part of the UW-Superior community for the last four years. Initially a math major, she discovered that she loved teaching and changed her major to language arts. Kayless will be student-teaching in the spring semester and will graduate in May 2021. Outside of classes, Kayless works at a daycare and lives in the Superior area with two dogs and two cats.

"This opportunity to research female pirates has provided me with great inspiration for classroom lessons and discussion topics."

Renewable Energy Investments in the Twin Ports Area: Are Superior and Duluth Prepared for a Sustainable Energy Future?

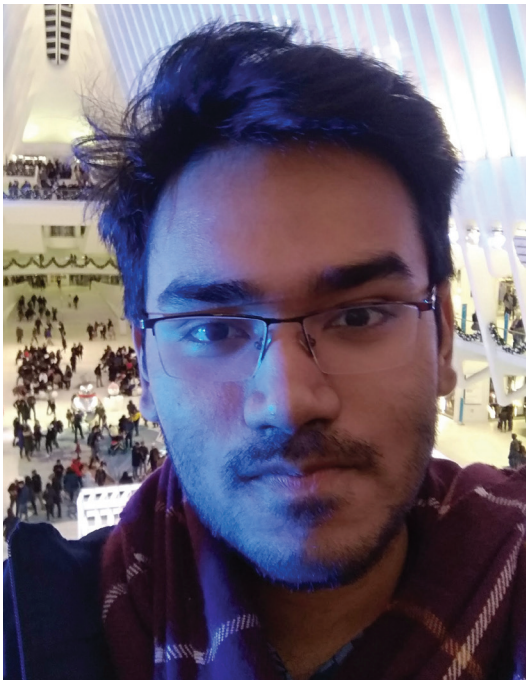
Sudarshan Choudhury
Mentor: Dr. Sakib Mahmud

Sudarshan Choudhury, known as Sudo to many at UW-Superior, arrived in the United States from Mumbai, India, in 2017. Sudo is a business management major and got interested in his project after talking with Dr. Sakib Mahmud about the possibility of working together on a project to collect information about renewable energy investments in Duluth and Superior. Sudo wanted to understand where the communities stood in regards to a more sustainable future. He began with an extensive literature review with the help of UW-Superior's Jim Dan Hill Library and numerous online resources. Although his project required some modifications to accommodate the COVID-19 pandemic restrictions, he was ultimately able to arrange interviews with individuals knowledgeable about renewable energy planning in the area. Sudo found that there is immense potential for renewable energy in the region, including a growing investment in solar energy, and identified some of the barriers. Sudo was excited to present his research at the Summer Undergraduate Research Symposium in October, and he thanks the UW-Superior Foundation for its generous funding support.

"On my very first night here, I was fortunate enough to experience what is called 'Midwestern nice.' Since that day, I have always felt a sense of belonging and tried to give back to this community."

The Influence of COVID-19 on Small Businesses in the Twin Ports

Sajid Hasan Chowdhury
Mentor: Dr. Praopan Pratoomchat



Sajid Chowdhury was interested in studying the economic shifts caused by the COVID-19 recession. During the summer of 2020, the pandemic was already causing great upheavals in the economy, which led to many businesses suffering financially. Accurate indicators for these impacts were hard to find as new data was still being collected, and most of the research being conducted did not focus on the Twin Ports area. Sajid used information from the Paycheck Protection Program and the Small Business Administration's Economic Injury Disaster Loan program as indicators to estimate the economic impact of COVID-19 on the small businesses in the Duluth-Superior area. Data from a Small Business Development Center survey were also used in this research. With the guidance of his mentor, Dr. Praopan Pratoomchat, Sajid looked at local businesses with less than 500 employees to calculate which sectors were most impacted.

Sajid is an international student from Bangladesh majoring in economics. He is involved in student government at UW-Superior and has an avid interest in politics. Sajid became interested in his research topic after Congress passed the Coronavirus Aid Relief, and Economic Security Act stimulus package. At the advice of his mentor, he narrowed his focus to small businesses in the Twin Ports area. Sajid hopes his research can be expanded upon to create a broader understanding of the COVID-19 recession.

Building and Characterizing a Spectrometer

Samuel Dettle
Mentor: Dr. Peter Cook

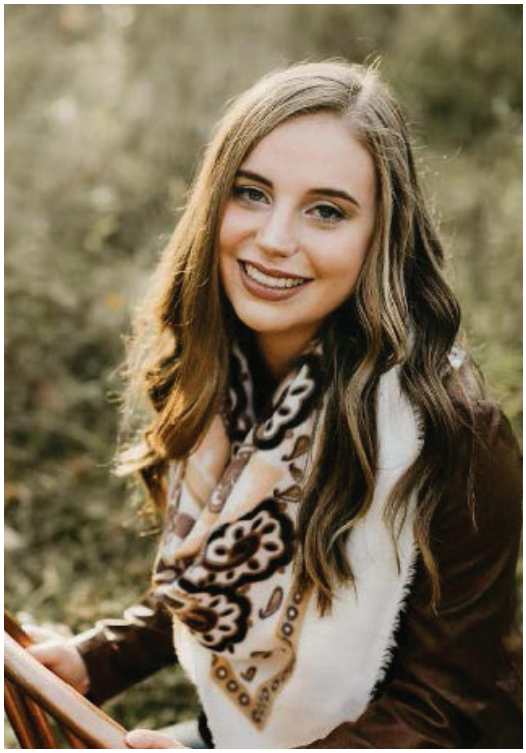
Samuel Dettle worked with Dr. Peter Cook on an ongoing physics research project focusing on optical rotation and spectral prediction. The characteristics of how linearly polarized light rotates based on wavelength when traveling through corn syrup was studied by a previous student. This summer, in continuing the effort of elucidating how to predict the colors that would be observed, Samuel built and calibrated a spectrometer, a machine that separates light by color (i.e. wavelength) and reports the brightness of each color. The spectrometer will be used in the ongoing research project. Samuel is continuing his research with Cook during the academic year to develop the mathematical model to predict the colors one sees given certain parameters of the setup.

Samuel came to UW-Superior as a pre-engineering student, and will graduate as a pre-medicine student with a major in chemistry. Samuel plans to apply to medical school and his research experience will benefit him in that process. He plans to work on research in the medical community.

"This project really helped me understand what it means to be doing research."

Historical Concentrations of Polycyclic Aromatic Hydrocarbons and Persistent Organic Pollutants in Superior, Wisconsin

Karsyn Doughty
Mentor: Dr. Lorena Rios Mendoza



Incidents like the 2018 Husky Oil Refinery explosion in Superior, Wisconsin, where fossil fuels and other oils make it into the environment, cause concentrations of polycyclic aromatic hydrocarbons (PAHs) to increase rapidly. Karsyn Doughty's project used existing data from similar historical events in the Superior area to look at the impact on concentrations of PAHs in the St. Louis River Estuary, Newton Creek and other local waters. The objective of this research was to compile background information about previous concentrations of PAHs in local waters to create a resource for future use and comparative studies.

Karsyn came to UW-Superior from Ladysmith, Wisconsin, in the fall of 2018 and is majoring in chemistry with a pre-med concentration. Her goal is to become a physician's assistant in women's health. Karsyn was drawn to UW-Superior for the small campus feel, outstanding science department and the many opportunities for research like her summer project. Karsyn has been researching with Dr. Rios Mendoza since her sophomore year and she loves the work she has been doing.

What Makes a Home: The Importance of Architectural Preservation Illustrated Through Children's Literature

Sonia Fields
Mentor: Anne Dugan

Sonia Fields finds inspiration in historic buildings and the lives of people in the past, so she wrote and illustrated a children's book about a house built in the 1800s. Her project's intention is to introduce historic preservation to younger generations through an accessible and expressive illustrated lens. The story is both heartwarming and informative, with the house itself at the center of the story. The book is directed toward children and adults, which allows the core concept of preserving history to be introduced to a wide audience. Sonia's goal was to motivate children to respect and learn about the homes in their towns that have remained pillars of the communities for hundreds of years. The book is written in couplet rhymes to promote early literacy. The illustrations were done in watercolor to add a soft and dreamy addition to the corresponding text.

Sonia, a junior majoring in visual arts, is from Prairie du Sac, Wisconsin. She has experience in several differentartistic mediums, but this project let her step outside of her comfort zone and start on her children's book – a project she has dreamed of creating for several years. Sonia hopes to publish her book when it is completed.

Ash Glazes

Amy Hightshoe
Mentor: Michael Maguire

Amy Hightshoe enjoys ceramics and exploring the variety of colors that can be achieved by layering glazes and using different types of glazes. A conversation with her mentor Mike Maguire about the possibilities of homemade ash glazes, led Amy to her summer project, which explored the consistency of color results from ash glazes compared to commercial synthetic glazes. Amy collected a variety of different types of wood, burned it to create ash and used the ash to create glazes. She also created numerous ceramic pieces, which were treated with the different glazes. Her study is providing a better understanding of mineral content in different woods and how it can be used to create unique glazing results.

Amy is from the Chicago area and moved to the Twin Ports in 2014. A career change, motherhood and her artistic inclinations led her to consider a career in teaching and she enrolled at UW-Superior for its art education program. Amy intends to continue her work perfecting an ash glaze process.

"The knowledge I gained through this project will help me in my career as an art teacher and as a ceramicist. This experience has been incredible and will not stop after this project is over. I am grateful for this project, as well as UW-Superior for giving me the opportunity to create a productive and rewarding career."

Exploring the Perceptions of Foster Parents about Mental and Emotional Well-Being

Sameena Knopik
Mentor: Dr. Allison Willingham

Sameena Knopik was driven to research the perceptions of foster parents about mental and emotional health due to her own experience with her adoptive parents. She conducted a literature review to further understand mental health within the foster system and also recruited foster parents to participate in interviews. Sameena learned that there is a gap between foster parents' understanding of emotions and children's genuine emotions. She presented her results in a webinar to faculty members from the psychology, legal studies, criminal justice, and social work programs, as well as practitioners from community agencies who work with children and foster families. She hopes to collaborate with criminal justice and social work classes at UW-Superior and other foster care providers to continue to share her findings.

Sameena is a junior majoring in legal studies and pursuing a double minor in Spanish and criminal justice. She grew up in North Dakota and came to UW-Superior for the legal studies program after a friend recommended it. She hopes to pursue a career that focuses on immigrant juvenile justice.

Vaping and Stigma at UW-Superior

Brandon Olson
Mentor: Dr. Deborah Augsburger

Brandon Olson became interested in the topic of vaping as a social practice and its implications for college students while taking Dr. Deborah Augsburger's medical anthropology course. The class conducted a campus-wide project on vaping at UW-Superior, which included interviews with other students. Brandon used the interviews as the foundation of his project to answer his research question: What stigmas are attached to vaping on a college campus and how do these stigmas compare to the stigma attached to smoking? Brandon learned that the stigma that exists surrounding vaping is directly tied to the stigma of smoking, but for college students this stigma changes and has different characteristics depending on the setting.

From Superior, Wisconsin, Brandon was drawn to UW-Superior by the community and the sense of pride he saw UW-Superior graduates carry into their future endeavors. The small class size and individual attention offered to students led to his decision to enroll.

"The funding I received for this project offered a level of stability and purpose during the tumultuous times of the COVID-19 pandemic. Having the opportunity to complete this project has given me some research experience that I will carry into my final year at UW-Superior and eventually into my graduate studies."

Investigating the Practical Use of in situ Chlorophyll-a Sensors to Monitor Algae in the St. Louis River

Student: Staci Reynolds
Mentor: Hannah Ramage

The increasing frequency of algal blooms in Lake Superior has created a need for effective continuous monitoring using in situ algae sensors. Staci Reynolds investigated whether the algae sensor in use by the Lake Superior National Estuarine Research Reserve offers an effective measurement of chlorophyll-a concentrations. Staci used a database of chlorophyll-a fluorescence data to determine how well the sensors worked. Through her project, Staci learned about the effects of algae blooms on the surrounding environment, how chlorophyll-a concentrations can be gathered, and the many factors that may interfere with the accurate operation of the sensor. Her research has provided a recommendation for further projects and research in this area as well as ideas for future modeling.

Staci is from Hazel Green, Wisconsin, and came to UW-Superior because of the school's proximity to Lake Superior and the opportunities it offered to gain experience in her area of interest – conservation of fish populations. Her research project resulted from conversations with Reserve staff about how algal blooms affect fish populations.

"This project gave me the opportunity to gain confidence with looking at data and spreadsheets to gather evidence and to create conclusions with the given data. The funding has allowed me to fully invest my time this summer to complete this research."

Hannah Ramage (left) and Staci Reynolds changing the EXO Total Algae Sensor on the St. Louis River on August 27, 2020.

Initiating a Visual Lake Levels Documentation Project

Sara Rybak
Mentor: Karina Heim

Sustained high water levels in the Great Lakes over the last five-year period have created challenges for coastal planners and managers. Sara Rybak's project initiates a long-term effort to collect photo data of high-water impacts within the immediate vicinity of Superior, Wisconsin, and Duluth, Minnesota. Water level imagery from 40 sites has been captured and georeferenced in the field using GIS Data Collector to establish a baseline Year 1 collection of images in anticipation of a long-term visual monitoring project that tracks water levels over a period of many years.

Originally from Sturgeon Lake, Minnesota, Sara recently moved back to the area. She transferred from Fond du Lac Tribal and Community College to finish her bachelor's degree at UW-Superior because of the strong environmental science program. Sara is an intern at the Lake Superior National Estuarine Research Reserve and appreciates the support provided by the staff there in helping her to develop her project and identify the need for it in our coastal community.

"The funding for this project helped me to continue my college journey. I pay for all my school out of pocket and this grant helped me pay for one of my classes. Thank you to all that made this project possible."

A water level documentation image from the Duluth shoreline from one of the 40 Twin Ports photo collection sites selected for this long-term visual monitoring project.

Comparative Study of SARS-CoV-1 and SARS-CoV-2 Virus

Mingma Sherpa Hoel
Mentor: Dr. Shanna Nifoussi

The coronavirus SARS-CoV-2, responsible for the COVID-19 pandemic, shares a close lineage with another human coronavirus, SARS-CoV-1. The latter led to the Severe Acute Respiratory Syndrome (SARS) epidemic in Asia back in 2003. Watching as the pandemic unfolded around the world, Mingma Hoel became interested in gauging the similarities and dissimilarities between the viruses and what they mean for the prospect of a future vaccine for COVID-19. Mingma performed a comparative study, looking at the how the viruses are related in terms of their general shape and structure of the spike proteins, and attachment to target cells in the human lungs. She accomplished her study by a thorough literature review of available scientific papers and clinical drug trials with the aid of her mentor, Dr. Nifoussi. Mingma found significant differences in the spike protein structure of the two viruses, which results in separate binding capacities to receptor cells in the human body. These differences explain why SARS-CoV-2 caused a pandemic and not just an epidemic, but also offer hope for a potential vaccine, despite the fact that one was never developed for SARS-CoV-1.

Mingma is from Nepal and she chose UW-Superior because of the amazing education it offered at an affordable price and the research opportunities available to her, which will be beneficial as she works toward a medical career. The experience Mingma gained through her summer project reviewing research articles and writing a scientific review style literature paper will assist her in her future endeavors for medical school and beyond.

"This funding made my longtime dream of working on a self-led research project related to human disease possible."

Likeness: An Exploration of Gender Dysphoria and Non-Binary Identity in Poetry

Liam Strong
Mentor: Julie Gard

Liam Strong's project explores intersections between various aspects of gender identity through poetry. Autobiographical in nature, the poetry manuscript they wrote and revised over the course of the summer encompasses themes surrounding naming, self-knowledge, claiming space, kinship, confusion and certainty and family love and oppression. Along with learning more about their own non-binary gender identity, Liam also expressed the gender dysphoria they experience through various forms of poetry. Liam plans to continue working with the collection of poems, submitting to literary journals and magazines, as well as submitting the manuscript to contests to be published by a small independent press.

Liam, a distance learning student from Traverse City, Michigan, discovered UW-Superior's writing program while looking for options to complete an undergraduate degree online.

Liam wanted to write a manuscript that would add to the growing array of transgender and gender non-conforming literature. They wanted to write poems with this audience in mind because people who identify as non-binary or have experienced gender dysphoria may not have literature or poetics to look up to. Liam's poems reflect their own experiences as a member of the LGBTQ+ community. After completing this project, Liam plans to finish their undergraduate degree and pursue a graduate degree in poetry, as well as a teaching assistantship.

Evaluating the Efficacy of Restorative Justice Practices in St. Louis County's Zero to Three Safe Babies Court Initiative

Elliana Waring
Mentor: Nathan LaCoursiere

Elliana Waring was interested in the introduction of the Safe Babies Court Program in St. Louis County, Minnesota, and how it would shape and change family court. Her specific research interest was in whether the Safe Babies Court Program and restorative justice approach is effective – particularly in comparison with more conventional approaches and foster care settings – in achieving greater caretaker attachment, family permanency and reunification. Elliana conducted a literature review to gain an understanding of how the program is set up nationally, and also arranged field interviews with a judge, coordinators and stakeholders involved in the program in St. Louis County. She found that the new program creates a supportive environment for parents that may lead to achieving higher rates of reunification and permanency for young children.

Elliana is a junior double majoring in psychology and criminal justice. She was drawn to her research topic after taking law and psychology classes that touched on the topics of trauma and childhood development and how they interact within our court systems. Her findings have encouraged her to continue research focused on advocacy and restorative justice practices in relation to the foster care system and juvenile justice.

"This research project allowed me to follow my passion for understanding how new court programs and restorative justice practices can be used to change the trajectory for vulnerable children within the foster care system."

The Improvised Concerto Cadenza: Historical Context for Contemporary Performers

Eliza Wilson
Mentor: Dr. Erin Aldridge

Many Classical period concertos contain at least one substantial cadenza, a virtuosic and rhythmically loose feature for the soloist, where the accompaniment stops or plays sparsely. Cadenze are intended to sound improvisatory, whether they are played with genuine extemporaneity, or composed beforehand, but in modern times improvisation is uncommon relative the prevalence of the concerto. Eliza Wilson's project explored the historical context and modern performance practices behind the improvised concerto cadenza, by synthesizing the available literature on the history of cadenzas with the approach from modern performers. Eliza found that philosophical differences between the modern separation of composer and performer, and the Classical period's attitudes explain the change in how cadenzas are performed today.

Eliza, a senior majoring in violin performance and music education, hopes this research encourages listeners and performers to reexamine their relationship with the concerto.

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