



The PSM Alumni and Graduation Chronicle



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Student Presentations at the 2021 NPSMA Conference

For the 2021 NSPMA Conference in Tampa, Florida, we invited students to prepare ten-minute presentations:

Michael Bigelow

University of Utah, Computational and Data Science program; 2021 Optimizing the Rate of Penetration of Natural Gas Drilling Rigs: A Shiny Web App Interface for Statistical Modeling Approaches

Drilling represents the costliest operation in natural gas exploration and production. This project seeks to lower cost by maximizing the rate at which the drilling rig penetrates through each successive geologic formation in future wellbores, using a twofold modeling approach based on 2020 data. The first approach uses Gaussian mixture model-based clustering on historic rig sensor data to find optimal drill rig control parameters for each geologic formation, similarly to Kristjansson et al. The second approach feeds novel drilling rig parameter combinations into a Random Forest model of rate of penetration to search for rig settings that are predicted to outperform the historical optimum. The entire workflow is presented in a Shiny web application format, allowing for use by engineers and geologists and assuming no user knowledge of code.

Jackelyn Gutierrez

Colorado State University
PSM Experience and Capstone Research Project with the Cheyenne Mountain Zoo

Seeking INNOVATOR Articles

Articles for the 2023 edition are being accepted now!

Submit a short description including a photo and/or graphic to:

manager@npsma.org by November 15.

Giraffes (*Giraffa camelopardalis*) are expeditious browsers in the wild and especially prone to oral stereotypies in managed care. Recent studies on zoo-housed giraffes call for new presentations of greater amounts of browse that extend feeding duration, yet these may not be time or cost friendly. We tested two new enrichment designs at the Cheyenne Mountain Zoo in Colorado Springs, Colorado: (1) the selling of browse instead of lettuce to guests in the giraffe feeding experience and its effect on stereotypic licking and guest engagement, and (2) a test to determine the specific duration of time a giraffe spends feeding on a piece of browse to suggest minimum amounts that should be provided in zoo facilities. Our goals were to design safe and novel enrichment presentations that promote natural species-specific behaviors in the giraffes, increase their engagement and overall health, and to improve on the Cheyenne Mountain Zoo's enrichment program. The giraffes were evaluated with behavioral observations and interval sampling over the summer of 2021. We found that stereotypical behaviors were reduced after introduction of the new methods, and guest engagement and natural behaviors increased. This research creates a look into a new direction for giraffe enrichment and provides a creative way for zookeepers to think about the design of their enrichment programs. Future studies should test these feeding designs in other hoofstock species, the long-term effect of these additions to an enrichment program, and how they may impact current diet and exhibit design standards.

(Continued on pg. 2)

STUDENT PRESENTATIONS (cont. from pg. 1)

Katherine Maus

University of Utah, Environmental Science program; 2021
Urban Pollinator Habitat Construction and Species Monitoring

Pollinators are integral to the health of our food sources and ecosystem function and biodiversity on this planet, but their populations are decreasing rapidly. This project addresses one of the causes of this decline, habitat loss, and implements a small-scale solution that can be reproduced in urban settings. Pollinator habitat plots were constructed throughout the Salt Lake Valley in various community gardens in urban areas. In partnership with Wasatch Community Gardens, perennial water-wise pollinator habitat vegetation was selected and plots were established. Within these community gardens, pollinator species monitoring was conducted throughout Summer 2020. Informational and educational materials have been created for distribution to urban residents to increase pollinator habitat, as well as for volunteers of Wasatch Community Gardens in order to maintain plots in the coming years. Data is presented regarding pollinator visitation relating to species of plant in bloom, weather at the time of monitoring, as well as distribution of pollinator genera throughout the summer. The plots constructed will persist in the future, and materials will be utilized by Wasatch Community Gardens to encourage pollinator habitat presence in urban areas.

2022 NPSMA Five-Minute Presentation (5MP) Competition

5MP at 2022 NPSMA Annual Conference in San Diego, CA (Nov 4, 2022)

The NPSMA is looking forward to a return of the live, Five-Minute Project (5MP) Presentation Competition at our annual conference in San Diego, CA on November 4th. The format allows students and recent graduates to craft a five-minute presentation describing their experiential work completed as part of their PSM program. This includes work completed as a capstone project, internship, or another professional experience project. Please consider entering your current or recently graduated students (Fall 2021, Spring or Summer 2022) who have completed their capstone project/internship for this exciting event!

The student 5-Minute Presentation is always a highlight of the conference. This year, the NPSMA is offering one free night at the conference hotel room for the first five (5) student participants to sign up. There will also be monetary prizes for participants.

Rules include:

- The presentation cannot exceed 5 minutes.
- A maximum of 5 slides can be used during the presentation.
- Animated content is allowed; however, animations need to produce a complete slide that stands on its own.
- The slide show must automatically advance through the presentation. The presenter will need to set the timings for each slide.

Directors, coordinators, or faculty of PSM-affiliated programs can submit the following information to the session moderator, Amber Bloechle (abloechle@uwf.edu), via email:

- Student's/Graduate's name
- Institution and Program
- Talk Title
- Abstract

For more information, please visit our website at npsma.org/5mp or contact Amber Bloechle.

Alumni Profiles

ROBERTO JOSÉ CANO, EDGAR SALAZAR

PROFESSIONAL SCIENCE MASTER'S, BIOTECHNOLOGY
CALIFORNIA STATE UNIVERSITY, SAN MARCOS, 2020, 2021



José Cano and Edgar Salazar are about to launch a business that has the potential to transform scientific research in Mexico. The PSM program at CSUSM helped chart their way. They are developing a company called SinerLab that will introduce an online sharing platform for reagents, equipment, and services to address the deficit of laboratory resources in Mexico. This will reduce costs and increase availability of the critical supplies needed for R&D.

Both earned their undergraduate degrees in Mexico. Their paths didn't cross until they enrolled in the Professional Science Master's Degree program at California State University San Marcos. For his capstone project, Cano was working on a nonprofit business plan to match San Diego biotech companies with used equipment for researchers in Mexico. His Semester-In-Residence project plan suggested that the plan was good, but the business model was not viable. But the capstone presentation caught the attention of many. One committee member was impressed enough to encourage him to continue. José then recruited Salazar, who was in the cohort just behind him, to develop a new business plan for the online sharing company. They built their model and desire based upon the PSM program experience. "Their prospects look good, and both are successfully employed. Their concept wouldn't have happened without the PSM program and all the support that came with it," said Al Kern, Program Founder and Advisor.

Contributed by Al Kern, California State University, San Marcos.



ROBERT O'BRIEN

PROFESSIONAL SCIENCE MASTER'S, FORENSIC SCIENCE
FLORIDA INTERNATIONAL UNIVERSITY, 2020

Robert O'Brien is a Forensic Biologist who manages the Forensic Biology Department at the Global Forensic & Justice Center (GFJC) at Florida International University (FIU). He serves as Subject Matter Expert and instructor for DNA and forensic biology training programs in both the United States and internationally. He is also responsible for training military personnel on Rapid DNA analysis systems and training military forces on biological collection and screening.

Robert has more than 17 years of experience as a forensic biologist. He is an FBI-recognized DNA auditor and performs reviews of audits and has completed the ISO 17025 Auditor training. Robert served five years as a forensic DNA analyst for the Florida Department of Law Enforcement (FDLE) with access to the FBI CODIS DNA database system. He provided expert testimony in more than 20 DNA cases in Florida courts.

Robert is a graduate of the Professional Science Master's in Forensic degree from FIU, and now serves as an instructor for the program. He earned his Bachelor of Sciences in Biology and holds a Certificate in Biotechnology from Florida Atlantic University.

(Continued on pg. 4)

ALUMNI PROFILES, ROBERT O'BRIEN (cont. from pg. 3)

"Managing a forensic research laboratory is a challenging combination of people, administration, and science. Having my PSM from FIU in Forensic Management has made my work easier and my employees more productive."

Contributed by Max M. Houck, Forensic Portfolio Innovator, Graduate Program Director, Florida International University .



REBEKAH J. WESTON (STEPHENSON)

PROFESSIONAL SCIENCE MASTER'S, INDUSTRIAL MATHEMATICS
MICHIGAN STATE UNIVERSITY, 2005

Rebekah graduated from Michigan State University's PSM in Industrial Mathematics program in 2005, then started a career in civil engineering. Her technical experience was used in groundwater dynamics for fractured rock media and determining the 1,000-yr contamination boundary at the Nevada Test Site, creating proprietary bioretention media mixes that help clean industrial runoff for up to 50 years, and performing infrastructure upgrades throughout Seattle. After working in the industry for 12 years, Rebekah started her own firm Red Barn Group, Inc. which provides construction management, civil engineering, and environmental engineering service. The business skills gained from PSM program were what allowed her to go on and win multimillion-dollar contracts and build a team of engineers and scientists for some of the largest infrastructure projects in the country.

The PSM education has helped Rebekah immensely in being able to dig deep into different topics and be a leader because of the vast knowledge that was required. The most important skill beyond the technical work was teamwork and inspiring teammates to do their best work. The engineering problems can have teams of 100 or 1,000 people and they all must move together. Communication becomes the key. The PSM program instills a lot of confidence in being a team member that can translate from one technical subject matter expert to another and how resolve conflicts.

As part of the industrial mathematics curriculum, Rebekah completed enough coursework in engineering, so she also received a master's degree in Civil Engineering at MSU. She has been continually collaborating with MSU engineering professors to work on proprietary bioretention media. Rebekah is an Ambassador for Magnet4Water that is an internationally recognized groundwater modeling program. Her goal is to be the first women-owned business to gross more than \$1B annually and to be a publicly traded engineering company within 15 years of conception.

Contributed by Peiru Wu, Ph.D., Director, PSM Program in Industrial Mathematics, Michigan State University .



(Continued on pg. 5)

ALUMNI PROFILES (cont. from pg. 4)

BRALEY GENTRY

MASTER OF SCIENCE IN PROFESSIONAL SCIENCE, FERMENTATION SCIENCE
MIDDLE TENNESSEE STATE UNIVERSITY, 2022



After receiving his undergraduate degree in biology, Braley knew he wanted to study fermentation science. He came to Middle Tennessee State University in Fall 2020 to pursue the unique Master of Science in Professional Science (MSPS) degree. As a graduate research assistant, Braley worked under the mentorship of Dr. Keely O'Brien, focusing on the optimization of kefir fermentation and the antioxidant properties of kefiran, an extracellular polysaccharide.

Braley completed an internship during the Fall 2021 semester with Delicato Family Wines in Manteca, California, as a degree requirement. He monitored raw juices and fermenting wines daily and completed bench trials for wine fining, blendings, and lab analysis. He also participated in research on micro-oxygenation and special ingredient additions.

When asked how the MSPS fermentation science program at MTSU helped Braley reach his goals in the wine industry, he said, "During my time with the MSPS program, I gained knowledge in both science and business that helped me succeed in securing and performing well in a job in the wine industry. The business core courses helped me gain leadership skills, build a resume, analyze statistical data, and much more. The fermentation science courses allowed me to specialize in topics such as sensory evaluation, bioprocessing, and food safety. The MSPS curriculum gave me the skills I needed to succeed in a harvest winemaking internship in California, where I gained real-world experience as a part of my program. My connections there and at MTSU expanded my professional network and opened doors for new opportunities."

Braley graduated in May 2022 and was offered a full-time winery lab technician position at the Biltmore Winery in Asheville, North Carolina.

Contributed by Suzanne Hicks, Graduate Coordinator, Master of Science in Professional Science, College of Basic and Applied Sciences, Middle Tennessee State University.

**JUSTIN NELSON**

PROFESSIONAL SCIENCE MASTER'S, ENVIRONMENTAL SCIENCES
OREGON STATE UNIVERSITY, 2021

Justin Nelson graduated from the Oregon State University PSM in Environmental Sciences program and currently works as a Senior Research Associate at the SustainAbility Institute by ERM. His role includes considerable research on sustainability in business, including sustainability strategies, materiality assessments, ESG reporting, and so on. The fusion of business and sustainability here mirrors that of the PSM program which highlighted the importance of corporate action and responsibility in the transition to a low carbon economy.

Justin started his professional career working in family financial planning and investments before moving on to ERM as a business analyst for the key client program. In the spring of 2020, he began his PSM journey. The courses were not only relevant to his consulting role, but also familiar with his business background. In the fall of that year, he started his internship working as a research consultant for the SustainAbility Institute on a report titled *The Changing Climate for Private Equity*.

(Continued on pg. 6)

ALUMNI PROFILES, JUSTIN NELSON (cont. from pg. 5)

This report focused on the integration of climate-related risks and opportunities in private equity investment strategies and formed the foundation for his final PSM report. This internship was not only the perfect fit for the PSM program as a shining example of environmental sciences and sustainability in a business / commercial capacity, but also was a great personal fit, given his background in finance and his desire to gain more technical expertise.

The PSM program and the degree allowed Justin to bridge the gap between his business and financial background with his interest and passion for environmental sciences and climate change. It was instrumental in quickly moving his way up the ladder to where he is now, and he has boundless opportunities to continue his career progression. The PSM program's structure is well-aligned for the working professional and helps integrate real-world content and experience into the educational setting.

Contributed by Carolyn Fonyo, PhD, MBA, Director, Environmental Sciences Graduate Program, Oregon State University.

**DANIEL MILLS**

PROFESSIONAL SCIENCE MASTER'S, ENVIRONMENTAL ANALYSIS
RICE UNIVERSITY, 2007

Daniel graduated from the Environmental Analysis program at Rice University in 2007. Prior to Rice, he attended Trinity University and earned a BS in Biology with minors in both Geoscience and Environmental Science.

After graduation, he started his career with HOK, a global architecture and engineering firm. At the time, sustainable design and green building were in their early years and USGBC's LEED (Leadership in Energy and Environmental Design) was just starting to gain traction in the commercial real estate sector. Daniel worked to establish and build a viable sustainable design consulting practice within the Houston office that provided strategic support in site optimization, water management, energy efficiency and indoor air quality to HOK's architects and engineers across the region. "The Environmental Analysis program was a good balance of business, entrepreneurship, environmental engineering and environmental law and policy. It gave me a broad understanding of sustainability and ultimately helped me to apply it to specialties such as commercial building design and construction."

During his 11 years at HOK, Daniel worked on a large variety of corporate, commercial, government and institutional projects including the first LEED Platinum facility for NASA at the Johnson Space Center. He also broadened his role at HOK, taking on additional roles as a project manager and in business development.

In 2018, he left HOK to become President and managing partner of Synchro Building Corporation, a Houston-based design-build firm that specializes in fit to purpose commercial facilities. "I've always had an entrepreneurial bug and when the opportunity to lead Synchro arose, I jumped at the chance to help build and grow a firm." Daniel met and fell in love with his wife Myriam Mills, a fellow Environmental Analysis alumnus, during his time at Rice. They have two rambunctious and hilarious boys and work together to keep the house in one piece.

Contributed by Dagmar Beck, Director, Professional Science Master's Programs, Rice University.



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ALUMNI PROFILES (cont. from pg. 6)

**TIA SAJEWSKI**

PROFESSIONAL SCIENCE MASTER'S, DATA SCIENCE
SAINT MARY'S COLLEGE, 2018

Tia Sajewski utilized the PSM approach to master's education to successfully make a drastic career change. Hailing from Dearborn, MI, Tia completed her undergraduate studies at the University of Michigan – Dearborn, earning a B.S. in Physics with a minor in Math. After spending nearly a decade in education, Tia began the PSM program at Saint Mary's while completing a master's in education program at Xavier University and also teaching at a Montessori school in Ann Arbor, MI. When Tia graduated from Saint Mary's in May 2018 with her M.S. in Data Science, she had already begun her new career as a Data Science Analyst at Blue Cross Blue Shield of Michigan (BCBSM).

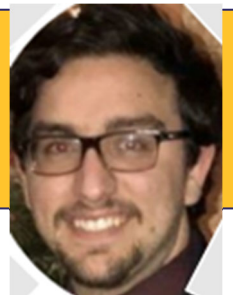
Tia can trace her career shift from education to data science all the way back to her time as an undergraduate student where she did research with modeling and extrapolating data. She then found herself collecting, analyzing, and presenting data while performing research projects into Montessori Education. From these experiences, Tia saw firsthand the impact that data can have and recognized the need and her desire to develop her ability to gain insight into decision making through data.

When Tia's position abruptly ended at the Montessori school at the start of her second year at Saint Mary's, she was able to secure an internship with BCBSM, which then turned into a full-time position upon her graduation. Since then, Tia has been promoted to Senior Data Science Analyst in the Analytics Center of Excellence at BCBSM. It has been five years since Tia made the switch into the field of data science. "Earning the degree from Saint Mary's was life changing to say the least!"

Contributed by Dr. Kristin E. (Jehring) Kuter, Associate Professor and Chair, Department of Mathematics and Computer Science Saint Mary's College.

**VINCENZO SCOTTO DI UCCIO**

PROFESSIONAL SCIENCE MASTER'S, BIOINNOVATION
TEMPLE UNIVERSITY, 2018



Vincenzo Scotto Di Uccio graduated from the PSM in Bioinnovation program in 2018 and started a consulting position with DuPont, where, in a year's time, he became a full-time staff member in their Digital Innovation Team known as Spark Digital. He advanced from a junior data scientist to being a lead data scientist on various international projects on machine learning in the manufacturing industry. He successfully deployed projects, which led to him being added to the Nutrition and Biosciences team that was sold to IFF.

At IFF, he continued to excel in the manufacturing space, delivering multiple successful projects that helped optimize their processes. In total, he spent 3 years in the manufacturing space, and, in that time, he helped newer employees find their footing, while simultaneously bringing impactful value to many manufacturing sites around the globe.

Now Vincenzo has moved into the hospitality space for Venetian Resort Hotel and Casino in Las Vegas, Nevada. Here he leads a team of Data Scientists helping the company to find value with machine learning and AI. As an alum, Vincenzo has also been tapped to teach in the recent semesters in an adjunct capacity.

Contributed by Seema Freer, Ph.D., Associate Professor, Managing Director, PSM Program, College of Science and Technology Temple University.



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ALUMNI PROFILES (cont. from pg. 7)

**MOHAMMAD HAQUE**

PROFESSIONAL SCIENCE MASTER'S, DATA SCIENCE AND ANALYTICS
SUNY BUFFALO STATE, 2020

Mohammad Haque received his bachelor's in mathematics from the University of Waterloo, after which he chose to attend the Buffalo State Data Science and Analytics (DSA) master's program. As a graduate student, Mohammad was awarded a graduate assistantship, where he helped the mathematics department with their technical needs, tutored students, and assisted with program projects. His internship was with the Buffalo State Teacher Education Unit, where he extracted information from their data from cleaning to the creation of dashboards. He graduated from the program in 2020.

"My favorite part of the graduate programs was the versatility of the courses. The whole program was designed for those who have a daily life outside of school, allowing them to fit in this opportunity to their busy schedule easily."

After graduation, he received an offer to work for CCNY Inc as a Data Analyst, where he handles everything involving their data warehouse, developing access databases for external clients, managing various dashboards, designing custom SQL queries, creating and designing dashboards, writing data management scripts and automation tools, and managing multiple junior analysts. When asked how the DSA program has helped him with his career, he said, "It directly helped me land my job through the power of networking. The program introduced me to Kim Herrington, who invited me to the famous Buffalo BI Workgroup. Here I was able to meet some of the folks over at CCNY and was able to interview with them, allowing me to land a job with them directly. But networking was only one of the puzzle pieces that assisted me in landing my first job. The emphasis on data analytics' social and ethical sides resonated with my employer and gave me the extra edge when landing my job."

Contributed by Heather Campbell, M.S. (she/her/hers), Program Coordinator, PSM in Data Science and Analytics, SUNY Buffalo State.

**SOOCHI VADERHA**

PROFESSIONAL SCIENCE MASTER'S, HEALTH CARE GENETICS
INSTITUTE FOR SYSTEMS GENOMICS,
UNIVERSITY OF CONNECTICUT, 2020



Soochi selected the PSM in Health Care Genetics program at the University of CT for its individualized plan of study allowing her to explore genetic disciplines and gain professional skill advantages, while deciding where to pivot her career from a fertility and wellness coordinator at Reproductive Medicine Associates of CT. Soochi completed two Momentum teaching and mentoring training classes and later applied these as an instructional assistant for two undergraduate classes; counseling and education for health professionals and molecular diagnostic techniques.

Gaining valuable knowledge and experience at the intersection of genetics in other fields, Soochi interned as a research fellow with startup company YouCOMM LLC and with Dr. Kristen Cooksey Stowers for health care policy research. Working with laboratory teams, genetic counselors, various health professionals, and patients, Soochi reviews testing questions and requisitions, creates reports, investigates genomic databases and scientific literature, and communicates in a manner conducive to increasing access to and understanding of genetic testing.

Born in Gendere, India, Soochi recognized that access to genetics care and public genetic literacy is increasing across diverse regions of the country and therefore, cultural competency training for health providers must also increase.

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ALUMNI PROFILES, SOOCHI VADERHA (cont. from pg. 8)

However, she pleads, “recognize that everyone, including YOU, no matter background, can contribute with impact to advancing the diversity, equity, and inclusion in genetics research, testing and counseling.” Soochi is the alumna who always reaches out to areas of the country with high diversity or where there are limitations to genetic care access volunteers to participate as a contact, on professional speaker panels, or as an advocate for our profession. Her closing advice to all graduate students is “Take advantage of diverse opportunities in your PSM, but also pay attention to the small stuff, such as how to make a presentation or write a resume.”

Contributed by Judy Brown, Director, PSM Program in Health Care Genetics, University of Connecticut, Institute for Systems Genomics.



PSM Certificate of Completion: Another Benefit of Membership

Affiliated PSM programs may request a PSM Certificate of Completion for their students. For 2022 graduates, email (manager@npsma.org) an excel file with the list of names of your students, names of program director(s) or other program official(s) and dates to be shown on the certificate. We will electronically send completed certificates within 2-3 weeks.

PSM Alumni may also request certificates by filling out the request form for the PSM Certificate of Completion found at www.professionalsciencemasters.org/certificate-completion-form.



The PSM Alumni and Graduation CHRONICLE


Executive Editor
 Dagmar Beck, NPSMA, Rice University
 Peiru Wu, NPSMA, Michigan State University


Managing Editor:
 Derek Payne, NPSMA


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