

SAS Day – Data Analytics and Covid-19 Pandemic
Friday, October 2, 2020
8:45 a.m. – 12:45 p.m.
Virtual Symposium

Program

8:45 am Welcome Remarks
Vijayan Sugumaran, *Department of Decision & Information Sciences, Oakland University*
C. Michelle Piskulich, *Interim Provost, Oakland University*

8:50 am Comments from Oakland University President
Ora Hirsch Pescovitz, *President, Oakland University*

Session 1: Moderator – Randall Westrick

9:00 am Garbage In Garbage Out? Lessons from COVID19 Antibody Testing, Pol-II ChIP, and Orphan Pediatric Retinal Diseases
Kenneth P. Mitton, *Eye Research Institute, Oakland University*

Abstract: Our research needs in data analysis and management come from the very common experience of bench researchers who find they want to access computational data tools for their research. This can mean a large learning curve to avail ourselves of the computing tools required, but it has also shown us that fundamentally big data analysis is only useful if you have good data to process. We have learned lessons from our past research to employ ChIP analysis of RNA Pol-II, and our recent progress into disease gene sequencing, that apply to any data-based research effort. Those lessons are to pay attention to the quality and integrity of your data. Avoid the garbage in, garbage out pitfall. In the ERI we have a human subjects study underway, started during the summer shut-down, to evaluate a fast serum COVID19 antibody test after numerous products that suffer false positives hit the US market in 2020.

Dr Mitton obtained the PhD in Biochemistry from the University of Western Ontario where he began studies in lens and cornea of the eye. He continued in vision research through post doctoral training at Virginia Tech, the National Eye Institute, and the Kellogg Eye Center, University of Michigan, where he took part in describing the first example of retinal degeneration caused by a mutation in the first known retinal specific transcription factor NRL. At Oakland, Dr Mitton's lab generated the first genome wide map of RNA polymerase association in a mammalian retina to detect activation of photoreceptor specific genes during photoreceptor maturation and discovered the rod photoreceptor specific promoter in the Mef2c gene. In addition to using gene expression markers of functional changes induced by VEGF isoforms in primary retinal endothelial cells, his group initiated targeted NGS testing for families with several orphan pediatric retinal diseases. Norrie disease, FEVR, and Retinoschisis.

9:30 am Medical Image Analytics in Light of COVID-19
Courtney Ambrozic, *SAS Institute*

Abstract: With the scope and severity of the COVID-19 pandemic, medical imaging and image analytics tools have never been more important. In particular, AI-based tools have been developed to automatically detect and monitor COVID-19 on chest scans of patients. This presentation illustrates with examples how medical image analytics in the SAS Platform can be used to detect and track diseases. A specific use case is SAS' collaboration with Amsterdam University Medical Center to improve treatment strategies for patients with colorectal cancer spread to the liver using analyses of 3D CT scans.

Courtney Ambrozic is a senior associate staff scientist at SAS Institute in Cary, North Carolina. At SAS, she is part of the computer vision team where she develops image processing and deep learning methods for the analysis of biomedical images. She received her B.S. in Computer Engineering and her M.S. in Electrical Engineering at the University of Dayton in 2017 and 2018, respectively. Her thesis work was in collaboration with Air Force Research Laboratory and involved the deconvolution of microscopic, material images for deblurring and feature recovery.

10:00 am Artificial Intelligence and drug repositioning against Covid-19
Aris Persidis, *Biovista, Charlottesville, VA*

Abstract: The vast amounts of healthcare information make it impossible to find or extract value except piecemeal. AI is the only realistic way to tackle this challenge. However, not all AIs are created equal. We need different AI doctrines to tackle open

versus closed problems, where machine learning isn't designed to apply. In this presentation, we will discuss data-hard healthcare problems, including in Covid-19, and how the right or wrong AI can make a big difference.

Aris Persidis is an entrepreneur in Big Data and AI Gamification with an established 20- year track record. He is Co-Founder and serves as President of Biovista, the Big Data/AI drug positioning and precision medicine pioneer, ranked Top-10 worldwide in healthcare AI (Forbes; CIO Bulletin; Deep Knowledge Analytics). Aris helped lead the creation and positioning of Project Prodigy, the AI platform that is based on recombining knowledge to build new solutions, instead of only matching, classifying and linking already known data (as per typical machine learning practice). He has negotiated and closed relevant deals with some of the most well-known organizations in the world, including Hewlett Packard Enterprise, Pfizer, Novartis, Astellas, BiogenIdec, the FDA, and a number of Patient Advocacy Groups. Prior to Biovista, Aris was SVP, Research and Business Development, at Upstate (acquired by Serologicals for \$205MM), and VP of Business Development at Serologicals (acquired by Millipore for \$1.4 Billion). Aris also worked on the establishment of and received co-founder stock in healthcare companies with significant growth and exits: Cellzome (acquired by GSK for \$100 MM), Anadys (acquired by Roche for \$240 MM), and RheoGene (acquired by Intrexon, \$ n/a). Aris also had an academic and administrative appointment at the Wharton School, where he was an Assistant Professor (Adjunct) and also Assistant Director, Medical Center Technology Transfer Program. He was the sole author of the monthly Industry Trends review column for Nature Biotechnology and he is the only contributor to date whose collected works were published by the journal in a single dedicated volume. Aris has also served as a judge for the Top-10 Innovations of The Scientist, also the Medical Marketing and Media Awards, and also the MIT Enterprise Forum (Greece Chapter). He served as the first co-Editor-in-Chief of the journal Drug Repurposing, Rescue, and Repositioning, and has written over 90 papers and book chapters. Aris has also guest lectured at Wharton, Columbia, George Washington, and the University of Auckland Business School. In early 2020, Aris was recognized as one of the world's top-50 Futurists (Abundant World Institute – Toffler Association). Aris received the Honeywell Futurist Award (HFA) while a 3rd year undergraduate student. The HFA was a Europe-Wide award recognizing a vision for our future 25 years out (Aris' contribution was artificial photosynthesis, many variants of which are now coming to pass). He received a First-Class B.Sc. degree in biological chemistry from Essex, U.K., received his Ph.D. in biochemistry from the University of Cambridge, U.K, and did post-doctoral research under Professor Sir Leszek Borysiewicz, current Chair of CancerUK, ex Vice Chancellor of the University of Cambridge. At present, Aris serves on the Board of Directors of Biovista and MBF Therapeutics.

Session 2: OU Alumni Panel Discussion – Career Opportunities in Analytics

10:30 am

Mark Guthrie, Director IS&S and CIO, AM General, Auburn Hills, MI

Gene Grabowski, Principal Solutions Architect & Data Scientist, SAS Institute, Inc.

Avanti Tatiraju, Access Technology Analyst, Henry Ford Health System

Amy Siebert-McKenzie, Post-Doctoral Fellow, Blood Research Institute, Wisconsin

Mark Guthrie is a two-time graduate of Oakland University, where he earned his Bachelor of Science degree in Computer Science as well as his Masters in Business Administration. Mark is an Information Technology leader with more than 30 years experience in various roles at automotive companies – Volkswagen of America, Mazda, ITT Automotive, Delphi, FCA, and Spartan Motors. He is currently the Chief Information Officer at AM General, a defense contractor headquartered in South Bend, IN with a Technology and Engineering Center locally here in Auburn Hills, MI. Mark's team is working closely with their business partners to bring process automation, data analytics, and other innovation technologies into the environment to support company growth and productivity objectives. Mark serves as Chair of the Oakland University Alumni Association, Chair of the Golden Grizzlies Champions Club Advisory Board, and as Secretary of the Leader Dogs for the Blind Board of Trustees. Mark resides in Clarkston, MI with his wife of 25 years, Marna, and a houseful of pets.

Gene Grabowski, Jr. serves as a Principal Solutions Architect and Data Scientist within SAS' Manufacturing Business Unit. Gene focuses on creating enterprise analytic solutions for manufacturing customers and explores every phase of the analytics lifecycle. Audiences range from other data scientists to senior executives to academic institutions. His over 25 years of analytics background includes: econometrics, time series forecasting, credit scoring and machine learning. Prior to joining SAS, Gene spent 13 years with Ford Motor Company and Ford Credit. Today, much of his work involves integrating Open Source with SAS and model deployment. Gene holds an M.A. in Economics from Michigan State University and a B.S. in Economics from Oakland University. In June 2020, he earned a Machine Learning Certification from Stanford University.

Avanti Tatiraju is an Access Technology Analyst at Henry Ford Health System where she works as a Salesforce consultant for different departments in her organization. She is a certified Salesforce admin and has been working in her current role for 3 years. Avanti has a Masters degree in Information Technology Management from Oakland University and an MBA in Finance from IMT Ghaziabad, India. Prior to working at Henry Ford Health System, she has worked as a Credit Analyst in HSBC, India.

Amy Siebert-McKenzie is presently a postdoctoral researcher in the laboratory of Dr. Alan Mast at the Blood Research Institute at Versiti Wisconsin. She is presently studying the physiological function of Tissue Factor Pathway Inhibitor (TFPI) and diseases that are associated or caused by intravascular blood clots, such as deep venous thrombosis, heart attack, stroke and vascular

dementia. Dr. Siebert-McKenzie began her research career as an undergraduate at Oakland University (OU), completing her B.S. and M.S. in Biological Sciences in the laboratory of Dr. Virinder Moudgil, where she investigated the molecular mechanisms of steroid hormone action and hormonal regulation of breast cancer. Dr. Siebert-McKenzie then transitioned to Dr. Randal Westrick's laboratory at OU for her PhD dissertation work, investigating the genomics of hemostasis and thrombosis. She obtained her Ph.D. in 2017, along the way earning the top university honor of most outstanding dissertation award. Dr. Siebert-McKenzie's career goal is to run her own highly innovative and vigorously funded research program investigating the genomics of thrombosis and hemostasis.

Session 3: Moderator – Fabia Battistuzzi

11:15 am Testing Northern Arizona Wastewater for Early Warning of COVID-19 Outbreaks
Crystal Hepp, Northern Arizona University

Abstract: The COVID-19 pandemic has highlighted limitations in the United States for pathogen testing, tracking, and treatment. Arizona was hit particularly hard by the virus due to early opening of businesses and also suffered from slow test results and testing backlogs. To better understand how the virus is moving over time and space within Arizona, we are using genomic data collected as part of human and sewage based sampling. In this talk, methods and results from our efforts thus far will be presented.

Dr. Crystal Hepp is an Assistant Professor of Informatics at Northern Arizona University, in the School of Informatics, Computing, and Cyber Systems and an Assistant Director of the Pathogen and Microbiome Institute. She received her Ph.D. in Molecular and Cellular Biology from Arizona State University in 2013. Her research team focuses on using genomics and associated metadata to understand how pathogens move over time and space. Hepp's research over the past few years has focused heavily on West Nile Virus and St. Louis Encephalitis Virus circulation throughout the southwestern United States. However, she temporarily repurposed her laboratory to focus on detection of SARS-CoV-2 and other clinically relevant viruses in sewage.

11:45 am Predictions, Role of Interventions in the Crisis of Virus in India: Data Science Call to Arms
Bhramar Mukherjee, University of Michigan

Abstract: India, world's largest democracy with 1.34 billion people, has undergone five phases of lockdown from March 25-June 30. However, the virus curve has not turned the corner yet and the peak seems to be in the distant horizon. In this presentation we will discuss an extended SIR model for predicting case-counts in India. We will evaluate the national lockdown as a non-pharmaceutical intervention through various public health relevant metrics and illustrate that regional variation makes the concept of a national peak nebulous. We finally end with describing recent methodological innovations regarding incorporating selective and imperfect viral testing in an extended SEIR model for COVID-19.

Bhramar Mukherjee is John D. Kalbfleisch Collegiate Professor and Chair, Department of Biostatistics; Professor, Department of Epidemiology, Professor, Global Public Health, University of Michigan (UM) School of Public Health; Research Professor and Core Faculty Member, Michigan Institute of Data Science (MIDAS), University of Michigan. She also serves as the Associate Director for Quantitative Data Sciences, University of Michigan Rogel Cancer Center. She is the cohort development core co-director in the University of Michigan's institution-wide Precision Health Initiative. Her research interests include statistical methods for analysis of electronic health records, studies of gene-environment interaction, Bayesian methods, shrinkage estimation, analysis of multiple pollutants. Collaborative areas are mainly in cancer, cardiovascular diseases, reproductive health, exposure science and environmental epidemiology. She has co-authored more than 200 publications in statistics, biostatistics, medicine and public health and is serving as PI on NSF and NIH funded methodology grants. She is the founding director of the University of Michigan's summer institute on Big Data. Bhramar is a fellow of the American Statistical Association and the American Association for the Advancement of Science. She is the recipient of many awards for her scholarship, service and teaching at the University of Michigan and beyond.

12:15 pm Accelerate Vaccine Research with Google AI Pipeline
Franz Salas, Naresh Jasotani, Google.

Abstract: This presentation provides an OVERVIEW of data analytics and machine learning approach to healthcare research and how to efficiently operationalize the process. You will be presented with a framework to design and deploy a highly scalable AI/ML process. Data is growing exponentially as more and more information is crowd sourced. For example, genomic data doubling every six months! Every organization is becoming data driven and technology driven to be more impactful. By the end

of the session, you will have an OVERVIEW of the process and steps involved in designing data driven research and applications with Google Cloud Platform. Examples of COVID-19 vaccine research flow will be highlighted.

Franz Salas is an experienced Account Executive with a demonstrated history of working in the computer software industry. Strong sales professional skilled in Poly-Cloud Strategies, Enterprise Storage, SDDC IT Strategy, Compute/Network/Desktop Virtualization, App/Dev Infrastructure, Opensource Frameworks, HPC, AI/ML Computing and Professional Services. With an MBA, Healthcare Information Management from Davenport University and a career rooted in technology, Franz is focused on unlocking business value partnered with many different organizations. His mission is to provide thought leadership in the following areas to bring the best of Google and help customers achieve strategic objectives: Digital experience leveraging omni-channel, Simplification of Front-Middle-Back office systems, Quantitative research at scale, Risk and Regulatory workloads, and Integration platform and API ecosystem.

Naresh Jasotani has over 16 years of experience in helping customers to get benefits of data, analytics and artificial intelligence advancements. With Machine Learning picking up in the last few years, he believes that it has brought endless possibilities for businesses to make data-based decisions, and be more predictive in their thought process. Naresh currently works at Google in the AI & ML domain and in the past, he gained consulting experience working for companies like Infosys, TCS, Accenture and Miracle Software Systems. He is passionate about building solutions with customers, published author (Book: Adopting TensorFlow for real-world AI), and avid YouTuber. He enjoys taking up new challenges, understanding customers' business problems and coming up with innovative solutions that can be solved by collecting, understanding, designing data, analytics and Machine learning solutions. He loves flying planes and has a Pilot's License as well.

12:45 pm Closing Remarks

Ravindra Khattree, *Department of Mathematics and Statistics, Oakland University*

SAS Hands-on Virtual Workshop
Saturday, October 3, 2020
9:00 a.m. – 12:00 p.m.

Program

9:00 am Getting Started with SAS: A Point-and-Click Approach
James Harroun, *SAS Institute*

James Harroun holds Master's of Science degrees in Information Science and Bioinformatics from the University of North Carolina at Chapel Hill. James has led technology and information systems teams through analytical transformations in manufacturing, consumer retail, and higher education domains. His work has included data integration, the validation and curation of big data, and aligning organizations' data structures with forward-thinking analytical and reporting needs. James is a certified SAS programmer and machine learning specialist and is the Data Science Initiatives Manager in the Global Academic Program team at SAS

12:00pm Workshop Closing Remarks