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2024 Analytics without Borders Conference

Hosted by Bryant University

Information System and Analytics Department
College of Business

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2024

Analytics without Borders Conference Program

Hosted by: Information Systems and Analytics Department of Bryant University

Host Contact: Tingting Zhao, Assistant Professor of ISA Department, Bryant University
(tzhao@bryant.edu), Thomas Dougherty, tdougherty1@bryant.edu, Executive in Residence, ISA

Department, Bryant University

Location: Bryant University, AIC Forum for Main Track

Date: March 22nd (Friday), 2024

Registration Link: <https://www.eventbrite.com/e/the-7th-analytics-without-borders-conference-tickets-818568609747?aff=oddtcreator>

The conference serves as a platform for individuals involved in various aspects of analytics to present and discuss their work, whether they come from corporate institutions, academia, or government organizations. This event aims to foster collaboration and bridge-building among diverse analytics communities.

The conference covers a wide range of topics in analytics, including applied statistics, optimization, data science, and more. We welcome anyone who works with data to share their insights. The conference sessions will feature a blend of corporate, academic, and government researchers and practitioners.

We strongly encourage both undergraduate and graduate students to submit their research or side projects. Moreover, we are excited to announce a student research competition during the conference, open to participating graduate and undergraduate students. The top five students in each group will receive the prestigious Excellent Student Research Award for AWB 2024.

Parking Instructions at Bryant University



If you are participating as a speaker or panelist at the conference, designated parking spaces have been reserved for you in Lot E, marked with red lines (see attached map). Additionally, students from colleges other than Bryant University are welcome to park in the areas highlighted in Lots B, C, and D. No parking passes are required for them, and there will be no ticketing on Friday, March 22nd. Below are visual examples of the reserved parking signs.



Analytics Without Borders

Reserved Parking

March 22nd



Summary of Schedules

The 7th Analytics Without Borders Conference Schedule

| Start | End | Main Track (AIC Forum) | Track 1 (Research talks, AIC 118) | Track 2 (Student research competition talks, AIC 130) | Track 3 (Interactive Analytics Workshop, AIC 131) |
|--------------|--------------|--|--|--|---|
| 8:00 | 8:45 | Registration, Breakfast and Coffee | | | |
| 8:45 | 9:00 | Welcome speech by President Ross Gittell at Bryant University | | | |
| 9:00 | 9:55 | Keynote 1: Mr. Todd Gustafson , HP President | | | |
| 9:55 | 10:50 | Keynote 2: Dr. Michael Jabbour , Chief Innovation Officer of Microsoft | | | |
| 10:50 | 11:00 | Morning Coffee Break | | | |
| 11:00 | 11:55 | Morning Career discussion panel Moderator: Tom Dougherty Panelist: Daniel McGowan , Dhananjay Tiwari Analytic Directors at Fidelity Investments Michelle Bicket Director of Health Care Analytics at Neighborhood Health Plan of Rhode Island Dustin Cabral Director of the Data Visualization & Analytics Practice at Cleartelligence llc Brenna Rojek little leaf farm, Chancellor Tang Data Engineer, BI Innovation, Travelers Insurance Mia Calegari Data Engineer, Insights Delivery, Travelers Insurance | 1A (Chair: Geri Dimas) John Visich Bryant University Huan Kuang Bryant University Bharatendra Rai UMass Dartmouth | 2A (Chair: Dr. ML Tlachac) Connor Emery Bryant University Jeffrey Cabral Bryant University Christian Savastano Bentley University Ryan Giammarco Bryant University David Bryce Bryant University | 3A (Chair: Dr. Kacy Kim) Visualize Your Data: Tableau for Beginners by Amelia Browning Data Visualization & Analytics Consultant at Cleartelligence |
| 12:00 | 13:00 | Lunch break | | | |
| 13:00 | 13:05 | Afternoon address by Dr. Madan Gopal Annavarjula , Dean of College of Business at Bryant University | Fidelity Investments Career Session Q&A (13:00 -14:00) Jonathan Sanford , Carolyn Barry University Relationship Manager | | |
| 13:05 | 13:45 | Spotlight: Dr. Tommy Gardner , Chief Technology Officer of HP | Fidelity Investments Career Session Q&A: Jonathan Sanford , Carolyn Barry University Relationship Manager | | 3B (Chair: Dr. Terri Hasseler) "AI and the Problem of Internet Simulator Detectors Dr. Terri Hasseler Director of CTE Constanza Bartholomae Associate Director Teaching Support Mary Catherine Boehmer |

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|-------|-------|--|--|--|--|
| | | | | | Assistant Director Educational Technologies |
| 13:40 | 15:00 | Research Major Talk Speaker: Prof. Suhong Li, Prof. Gao Niu, Prof. Nafees Qamar, Prof. ML Tlachac, | 1B (14:00-15:00) (Chair: Chen Zhang) Sagar Bansal and Jesus Lopez Southern New Hampshire University Le Chang Bentley University | 2B (Chair: Jiaying Weng) Sabrina Rao Bryant University Jiwon Kim Bentley University Nafise Aalipour URI Liam Smith Bryant University Sai Sahithi Neela, etc UMass Dartmouth Mohit Bansal Babson College Kejing Hu, etc Bentley University | 3C (Chair: Abhijit Chaudhury) (13:40-14:40) "Rhode Island Department of Health's Modern GIS Environment" by Jay Metzger GIS Manager Rhode Island Department of Health, Adjunct Professor |
| 15:00 | 15:20 | Afternoon Coffee Break | | | |
| 15:20 | 16:10 | Women in Analytics Panel, Moderator: Dr. Kacy Kim Panelist: Preethi Lodha Data Analytics and Insights Manager, The University of Massachusetts Katy Sandlin McMahon Practice Director, Application Development, Cleartelligence | | | |
| 16:10 | 16:25 | Results of Student Research Competition Announcement and Closing by Dr. Rupendra Paliwal , Provost of Bryant University | | | |
| 16:25 | 16:30 | Closing by Next host: Dr. Kevin Mentzer , Dean of Innovation, Research and Experiential Learning at Nichols College | | | |

All time are Eastern Time Zone

Main Track (AIC Forum)

Keynote Speaker 1



Todd Gustafson '86, President of HP Federal LLC and Head of U.S. Public Sector at HP Inc.

In this role, Gustafson is responsible for managing customer and partner relationships, strategic financial plans, product and technology strategies, sales force strategy and structure, and P&L ownership within HP's U.S. Public Sector business. As the leader of HP Federal LLC, a wholly owned subsidiary of HP Inc., he is focused on providing IT innovation, enabling business outcomes, and supporting the U.S. government, State and Local Government, K-12, and High-Education across the United States. With a 30+ year tenure at HP, Gustafson has held a variety of leadership positions in Channel Sales, Direct Sales, and ISV Marketing. Most recently, Gustafson took on the role of Vice President of U.S. End User Sales, which included the Commercial customer segment. From 2006 to 2012, he was Vice President for the Personal Systems Group (PSG) Commercial Solutions organization. Before that, Gustafson was the Vice President of U.S. Workstation sales. Gustafson graduated from Bryant University in Smithfield, Rhode Island. He currently resides in Massachusetts, where he continues to be an avid road cyclist and remains actively involved as a leader in various community organizations.

Keynote Talk Title: Future Ready with Data Analytics

Abstract: In this keynote presentation, Todd Gustafson shares his career journey, how HP uses data analytics for problem-solving and innovation, current trends, opportunities, and the essential skills and competencies for a successful career in data analytics.

Keynote Speaker 2

Dr. Michael J. Jabbour, Microsoft Education Chief Innovation Officer.



Dr. Michael J. Jabbour is an expert in organizational transformation, with over two decades of experience spanning artificial intelligence, human-centered design, agile development, and healthcare at scale. As the Chief Innovation Officer for Microsoft Education and a former CIO/CTO for various NYC agencies, notably the NYC Department of Education, he has spearheaded numerous digital transformations and operational mergers, generating substantial investments in innovation project funding and constructing programs that benefit millions of users. His current role at Microsoft leverages his experience and passion for making a positive societal impact through advancements in education.

Keynote Title: The Future of Education and Healthcare, Embracing AI's Potential in Education, Ethics, and Society

Abstract: Discover the transformative world of Artificial Intelligence (AI), from its fundamentals to its uncharted propensity to 'hallucinate.' Learn how AI can revolutionize education, enhancing teaching and learning experiences with cutting-edge tools and personalized methodologies. Dive into the potential of AI to automate routine tasks, stimulate collaborative learning, and foster bespoke educational journeys. Get equipped with practical use cases and insights on seamlessly integrating AI into your classroom or institution and pave the way for a future where education is intuitively tailored, engaging, and impactful.

Spotlight Speaker 1

Dr. Tommy Gardner, Chief Technology Officer for HP Federal



Tommy Gardner is HP's Chief Technology Officer for HP Federal, spanning the US Federal Agencies, Higher Education, K-12 Education, State and Local government customer segments, as well as Federal Systems Integrators. His current responsibilities include technology leadership, strategic technology plans, product and technology strategies, sales force technical support, and customer and partner relationships. Previously, Tommy has served as the Chief Technology Officer for Jacobs Engineering, Scitor, and ManTech. Earlier in his career he was a senior technical executive at Raytheon. In the U.S. Navy he served as the Deputy for Science and Technology for the Chief of Naval

Research. He oversaw the Navy's Deep Submergence Program as well as its Advanced Technology Program. He also commanded the nuclear submarine, USS San Juan (SSN 751). Tommy's educational background covers multiple disciplines and fields of interest including: cybersecurity, data science, blockchain technologies, artificial intelligence, high performance computing and systems integration in government markets.

Spotlight Title: Ethics in Cyber: Where do you stand?

Abstract: As the technology in cybersecurity is rapidly changing how is our progression of ethical standards keeping up? What are the questions in the field that we need to deal with? What is the framework we use to determine the answers? This talk will cover several issues and inspire even more self inspection on where you and your company or institution stand on the issue. Will you do the right thing at the right time?

Morning Career discussion panel (AIC Forum)

Moderator: Tom Dougherty

Panelists: Daniel McGowan | Analytic Directors at Fidelity Investments

Dhananjay Tiwari | Analytic Directors at Fidelity Investments

Michelle Bicket | Director of Health Care Analytics at Neighborhood Health Plan of Rhode Island

Dustin Cabral | Director of the Data Visualization & Analytics Practice at Cleartelligence LLC

Brenna Rojek | little leaf farm

Chancellor Tang | Data Engineer, BI Innovation, Travelers Insurance

Mia Calegari | Data Engineer, Insights Delivery, Travelers Insurance

Major Research Talk (AIC Forum)

ML Tlachac | Assistant Professor of Information Systems and Analytics Department, Bryant University

Talk Title: Advancements in Mobile Sensing for Mental Health Assessment



Abstract: The pervasiveness of mental health disorders, like depression and anxiety, presents many public health challenges. There is a need for effective, accessible, and scalable approaches to perform early screening for mental health disorders. Due to advances in computing and the ubiquitous nature of smartphones, passive sensing has become a promising screening approach for the future. This talk provides an overview of the current state of passive sensing for mental health assessment as well as discusses research challenges. Further, this talk also covers some specific examples of how passive sensing modalities like text messages can be leveraged for mental health assessment.



Prof. Suhong Li | Professor and Information Systems and Analytics Department Chair, Bryant University

Talk title: An Analysis of Social Media Conversation about Extreme Weather Events Over Time

Abstract: With the increasing number of extreme weather events and various disasters, people are paying more attention to environmental issues than ever, particularly global warming. Public debate on it has grown on various platforms, including newspapers and social media. This study examines emotions of the general public on global warming in the context of extreme weather events, how emotions differ by location and the change of emotion on those topics over the time. Topic modeling is used to reveal dominant topics for each type of extreme weather. The results show that discussions on Twitter predominantly focus on floods and drought/heatwaves. There has been a consistent increase in Twitter conversations about extreme weather over recent years. Emotion analysis indicates that sadness, followed by anger, are the most prevalent emotions in discussions about various extreme weather events. Topic modeling reveals major topics in extreme weather focus on their escalating intensity and the resulting environmental, social, and emotional impacts. Additionally, these conversations often involve debates, skepticism, and considerations of risks associated with climate change/global warming.



Prof. Gao Niu | Associate Professor and Department Chair of Mathematics and Economics, Bryant University

Talk title: Introduction to Generative AI mechanism and AI's influence on Higher Education

Abstract: In this session, I will talk about generative AI, exploring its fundamental mechanisms, practical applications in everyday scenarios, and responsible AI utilization. With an eye toward the educational sphere, I will examine the impact of AI on higher education, considering both its opportunities and challenges. I will discuss how institutions of college education can effectively adapt to this technological paradigm shift, ensuring a proactive response to the evolving landscape of education in the age of AI.



Nafees Qamar | Associate Professor and Program Director for Master of Science in Healthcare Informatics, Bryant University

Talk Title: Optimizing Childhood Immunization through Cost-Effective ICT Solutions

Abstract: Routine immunization coverage in developing countries is sub-optimal with 10-30% of children not receiving routine vaccines. This leads to approximately 700,000 annual deaths resulting from vaccine-preventable diseases and invokes the need for expensive supplementary immunization campaigns to overcome gaps that in turn divert time and resources from routine immunization. Coping with this situation requires tools and technologies able to identify geographic and programmatic gaps in coverage, i.e., it must be possible to accurately compute the ratio of vaccinations over the total number of people in need, in order to assess the current situation and to improve coverage. This research offers a gradual replacement of the current immunization process in a low-resource setting using a low-cost LETUS (Lightweight Electronic Traceable and Updatable System) solution to increase immunization coverage, and traceability. The eHealth solution will improve the coverage of childhood immunization and reduce the need for supplemental immunization campaigns.

Women in Analytics (AIC Forum)

Moderator: Prof Kacy Kim | Associate Professor of Marketing at Bryant University

This session is open to all, with a particular emphasis on fostering diversity and inclusivity in the analytics sector. Our esteemed panelists, who possess advanced experience in analytics and actively mentor young analysts, will address critical questions such as preparing for a career in analytics, identifying key skills and experiences for success, and promoting gender diversity in the workplace. Participants, regardless of gender, will gain valuable insights into managing workplace challenges, finding supportive employers, and advancing careers in analytics.

Panelist:

Preethi Lodha | Data Analytics and Insights Manager, University of Massachusetts

Katy Sandlin McMahon | Practice Director, Application Development, Cleartelligence



Preethi Lodha is a distinguished data visualization professional boasting over 10 years of experience in data analytics. She has earned a reputation for her exceptional ability to translate intricate data into captivating visual narratives. Currently serving as the Data Analytics and Insights Manager and a member of the Diversity Equity, Inclusion & Accessibility committee at the University of Massachusetts, Preethi plays a pivotal role in supporting leadership by providing analytics-driven insights to enhance the decision-making processes. Preethi's visualizations have garnered widespread acclaim, amassing over 1 million views. Her achievements include winning the Women in Analytics Data Visualization and Chart Champ awards and being named a Tableau Ambassador. Fluent in multiple languages and experience working across three continents and cultures, Preethi brings a unique global perspective to her work. In addition to her professional accomplishments, Preethi is passionate about inspiring and empowering others to embrace diversity and storytelling in data visualization. She firmly believes in the power of diverse voices to enrich human experiences and drive positive change.



Katy Sandlin McMahon is the Practice Director of Application Development at Cleartelligence, an AI & Data Analytics firm. She has over 12 years of experience in the data and analytics sector across the consulting and academic publishing industries, with experience in data visualization, UX and UI design, full-stack web development, data engineering, and database admin. She holds an M.S. in Library and Information Science from the University of North Carolina at Chapel Hill and B.A. degrees in Latin, Classics, and English from the University of Georgia, which all inform her focus on data literacy. Katy runs Cleartelligence's Women in Consulting ERG and is a lover of all science fiction.

The overarching aim of our session is to explore "Empowering Women in the Data Industry: How can universities and companies collaborate to facilitate the entry and success of more women in the data realm?" This theme is both timely and critical, seeking to address and dismantle barriers while highlighting pathways to empowerment and equity in the analytics sector.

Interactive Analytics Workshop (AIC 131)

Tutorial Session 3A

Title: "Visualize Your Data: Tableau for Beginners"



Instructor: Amelia Browning (Presenter), Data Visualization & Analytics Consultant at Cleartelligence

Amelia is a Data Visualization & Analytics Consultant at Cleartelligence. She provides consultation on data visualization best practices, defining metrics of success, and streamlining & simplifying data stream processing. She is a Tableau Desktop Specialist, and samples of her work can be found on her Tableau Public profile. Prior to joining Cleartelligence, Amelia worked in the advertising industry, analyzing digital media data. She honed her data skills designing a data warehouse and weekly analytical reports for a multi-million-dollar restaurant client. She studied mathematics with a concentration in statistical learning at the University of

Massachusetts Boston, which she put to work in her Chart Champ 2020 finalist dashboard, the Gender Blender, analyzing the effect of gender weighting on IMDB movie ratings.



Instructor: Dustin Cabral, Director of the Data Visualization & Analytics Practice at Cleartelligence llc

Dustin Cabral is a dynamic leader in the field of data analytics, known for his expertise in data visualization, analytics, and solution engineering. With a proven track record of success, Dustin has accumulated over a decade of experience in driving organizational change and providing instant insights through innovative visual solutions.

As the Director of the Data Visualization & Analytics Practice at Cleartelligence llc., Dustin leads a team of 20 consultants, supporting numerous client engagements at Fortune 500 companies around the country. In addition to his corporate roles, Dustin is an esteemed Tableau E-Learning Author & Instructor, reaching over 40,000 students through his engaging courses on the Maven Analytics and Udemy platforms. He also dedicates his time as a guest lecturer at prestigious universities such as Tufts, Bryant, and Babson, sharing his knowledge with future generations of data enthusiasts.

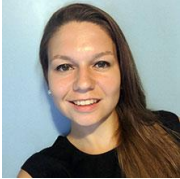
Tutorial Session 3B

Title: "AI and the Problem of Internet Simulator Detectors: How to Use them Effectively"

Instructors:



Dr. Terri Hasseler, Director, Center for Teaching Excellence, Bryant University



Constanza Bartholomae, Associate Director, Teaching Support, Center for Teaching Excellence, Bryant University



Mary Catherine Boehmer, Assistant Director, Educational Technologies, Center for Teaching Excellence, Bryant University

Tutorial Session 3C

Title: “Rhode Island Department of Health’s Modern GIS Environment: Guiding RIDOH into the Future with Location Intelligence”



Instructor: Jay Metzger, GIS Manager, Rhode Island Department of Health, Center for Health Data and Analysis, Adjunct Professor at Bryant University

Abstract: This presentation will cover the RIDOH ESRI GIS Environment, consisting of multiple cloud-based map portals, Data Governance, Best Practices, Training Modules, and Policies that make up our GIS focus at the Rhode Island Department of Health. Aspects of obstacles and implementation of this environment will also be shared, as well as demonstrations of Modern

GIS solutions that have been developed to support this work.

Research Session 1A (AIC 118) Moderator: Prof. Geri Dimas

John Visich | Professor in the Management Department at Bryant University

Talk Title: Supply Chain Procurement Employee Competencies for Industry 4.0: Canada, the United Kingdom, and the United States



Abstract: In this research we present the results of a survey of supply chain procurement personnel on the knowledge, skills, and abilities (KSAs) that entry level supply chain employees should possess. The respondents come from Canada, the United Kingdom, and the United States. We focused on the following seven categories: Maintain Competitiveness, Seize Opportunities and Mitigate Threats, and Sense and Shape Opportunities and Threats, Technology, Sustainability, Technical Skills, and Soft Managerial Skills. We compare and contrast the results for the three countries using averages and two-sample t-tests. For the survey items within each category for each country we present key Spearman correlations and a cluster variables analysis to determine the relationships between the KSAs within the

category. This research highlights the similarities and differences between procurement specialists regarding the importance of key competencies entry level supply chain employees will need to meet the requirements of the Industry 4.0 era.

**Bharatendra Rai | Professor / Chairperson
Decision & Information Sciences, UMass Dartmouth**

Talk Title: Statistically planned computer experiments for hyperparameter tuning a deep learning convolutional recurrent network for author classification

Abstract: Sequence of words in text data have long-term dependencies and are known to suffer from vanishing gradient problem when developing deep learning models. Although recurrent networks such as long short-term memory networks help to overcome this problem, achieving high text classification performance is a challenging problem. Convolutional recurrent networks that combine advantages of long short-term memory networks and convolutional neural networks, can be useful for text classification performance improvements. However, arriving at suitable hyperparameter values for convolutional recurrent networks is still a challenging task where fitting of a model requires significant computing resources and thus requires a systematic planning of the trial runs. This paper illustrates advantages of using convolutional recurrent networks for text classification with the help of statistically planned computer experiments for hyperparameter tuning. The results obtained indicate improved performance by convolutional recurrent networks compared to a standalone long short-term



memory network.



Prof. Huan Kuang | Bryant University

Talk title: A robust classifier of climate innovation related patents

Abstract: Our study presents a novel patent classification model tailored for Climate Change Mitigation Technologies (CCMTs), incorporating an innovative two-layer framework within the Cooperative Patent Classification (CPC). The model, designed to enhance classification accuracy, utilizes a combination of advanced Natural Language Processing (NLP) and machine learning techniques. By distinguishing patents related to CCMTs more accurately, the study aims to support the development and dissemination of innovative climate solutions. The proposed model demonstrates high accuracy, contributing to the field of patent data analysis and

classification. The research underscores the potential of open-sourced tools in identifying climate innovations, facilitating the progress towards sustainable technological advancements.

Research Session 1B (AIC 118) Moderator: Prof. Chen Zhang

Prof. Sagar Bansal | University Southern New Hampshire University

Prof Jesus Lopez | University Southern New Hampshire University

Talk title: Revolutionizing learner success and support by employing Generative AI and NLP approaches.

"Please note that the speakers can only attend virtually.

Abstract: The talk will walk through how textual data from multiple channels such as Voice of the Customer, Call Interaction, Chat History, and Surveys can be passed through a series of Gen AI and NLP modules to effectively produce directly useable outcomes. We will explore various ensembles to accomplish our key motivator: Real-time Interventions for Expedited Resolutions. You will learn how combining classical ML classifiers with modern Gen AI supplementations including prompt engineering enables a Gen AI and NLP ensemble that can empower organizations to gather learner information, enrich it with historical data, surface precise challenges/opportunities, and automatically determine if an action is needed or not. In addition, you will also be able to create a targeted directory of actionable insights for resolving challenges and seizing intervention opportunities based on the need for action. This presentation will demonstrate working solutions that have been tested numerous times on internal use cases and have been producing exemplary results. It'll dissect our methodology and modules, providing an in-depth understanding of their functionalities and revealing how their synergistic integration forms intelligent structures from raw unstructured text. It will also present the performance we received based on our approach and how it varies with the scale of data. Keeping enhanced learner experience at the core of the impact list, these approaches will also result in a centralized learner view, textual data-supported initiatives, higher productivity/lower cost, and reduced learner resolution time.

Le Chang | Master Student at Bentley University

Talk title: Exploring the Impact of Industry Payments in Healthcare: Are there Associations Between Pharmaceutical Company Payments and Drug Distribution?

Abstract: This ongoing research project aims to understand the impact of industry payments on payment receivers (physicians, nurse practitioners, etc.) prescribing behavior within the healthcare system, utilizing data from the Centers for Medicare & Medicaid Services (CMS) Open Payments dataset and Medicare Part D Prescriber dataset. Given the increasing emphasis on transparency and accountability in healthcare, understanding the relationships between payments made by pharmaceutical companies and prescribing behavior among healthcare providers is crucial for maintaining integrity and quality of care. Additionally, managing spending on payments is a significant concern for pharmaceutical companies. Historical evidence of these relationships can serve as a valuable reference for companies' business decision-making and cost-saving initiatives.

The CMS Open Payments dataset provides detailed information on financial relationships between pharmaceutical companies and healthcare providers, including payments, gifts, and ownership interests.

Medicare Part D Prescriber dataset contains prescription data for drugs covered under Medicare Part D, offering insights into prescribing patterns.

This study utilizes data spanning from 2015 to 2021 to explore the company's payments and the drug prescriptions within 12 months after the year the prescribers received the payments. It investigates six drugs from four manufacturers, covering treatments for type 2 diabetes, high blood pressure, heart failure, bronchospasm, and chronic obstructive pulmonary disease (COPD). The research encompasses over 50,000 physicians. So far, only total prescription number was used to measure the drug distribution. While a linear relationship between payments received by healthcare providers and their prescription behavior was not identified, intriguing findings have emerged for each drug based on time series, gender, payment type, etc. Different payment patterns among different drugs may indicate the variations of marketing strategies among companies. Continued research on this project aims to further explore these insights.

Student Research Competition (Undergraduate Level) AIC 130

Connor Emery (Undergraduate Presenter), Suhong Li | Data science student at Bryant University

Talk title: A Longitudinal Study of Global Warming Discussion on Social Media

Abstract: Over the past few years, a rise of global warming and climate change discussion has caused spikes in concern regarding our changing environment as well as what it means for the future. This study analyzes 12 years of data from twitter/X, focusing on changes in the climate change conversation, using the three stages of the COVID-19 pandemic: pre, during and post pandemic. Employing natural language processing techniques such as word clouds to visualize word frequency, big player analysis in order to determine top influencers, and topic modeling to uncover prevailing themes, we identify the dynamic nature of climate change conversation regarding global warming. It was discovered that the conversation has become more action based than it was pre pandemic and major players included Donald Trump in the precovid data frame as well as Elon Musk in the postcovid data frame. All analyses for this study were completed in an HPC environment through access granted by the National Science Foundation's CAREERS Cyberteam grant and the University of Rhode Island.

Jeffrey Cabral (Undergraduate Presenter), Tingting Zhao | Data science student at Bryant University

Talk title: Enhancing NFL Playoff Prediction with Explainable AI: Controlled Variable Selection Using Knockoffs Framework

Abstract: Predicting the outcomes of National Football League (NFL) playoffs holds significant importance within the realm of sports analytics, offering invaluable insights for decision-making. It also carries substantial business implications for various stakeholders, including teams, broadcasters, advertisers, and sports betting entities. Data-driven analysis using comprehensive season statistics and online information management have been utilized in professional and collegiate sports to improve prediction performance. In this work, we proposed a state-of-the-art knockoffs framework in the realm of Explainable Artificial Intelligence (XAI) to pinpoint the most informative predictors for playoff prediction while maintaining a controlled False Discovery Rate (FDR) and facilitating informed decision-making in sports analytics. To illustrate the efficacy of our innovative approach, we showcase its capability to enhance prediction accuracy by 5% to 18% across multiple machine learning models by using only four selected features instead of the full 18 feature set. We validate these findings using real NFL data spanning from 2018 to 2023. We also evaluate the model using multiple evaluation metrics including precision, recall, and f1-score, exhibiting consistent improvement across them all.

Christian Savastano (Undergraduate Presenter), Henry Dao, Anthony A. Smith | Undergraduate student at Bentley University

Talk title: Cooling Regulation on a Heating Planet: A Sentiment Analysis of Public Comments on the SEC's Climate Disclosure Rule

Talk abstract: The recently promulgated final rule on climate-related disclosures by the US Securities and Exchange Commission (SEC) is one of the largest changes to corporate disclosure reporting in recent years. With the dire consequences of climate change seeping into the mainstream contenance, many individuals are concerned about the impact of rising seas, extreme weather, and a heating planet. Investors and businesses alike have taken notice, with many companies voluntarily disclosing environmental impacts and targets in a bid to attract greater investment and do environmental good. The SEC has sought to require and standardize these currently voluntary and fragmented disclosures. The SEC proposed a rule to standardize climate reporting, opening a public comment forum for stakeholders to give their thoughts. This paper uses supervised machine learning to conduct a sentiment analysis of comments on the proposed SEC rule. The sentiment analysis involves using nine independent algorithms to determine sentiment as a soft-voting ensemble. Using TF-IDF scores, the models categorized comments sentiment to multiple questions. Bigrams were constructed to allow for analysis and interpretability. The study delves into the diverse range of opinions offered by various stakeholders and their respective sentiments, identifying key points of contention that were ultimately modified in releasing the final rule.

Ryan Giammarco (Undergraduate Presenter), Suhong Li | Data science student at Bryant University

Talk title: Understanding the Public Reaction to Major United States Environmental Policies through Twitter

Abstract: In an era where climate change and global warming are rising to the front of many political and social conversations, understanding the public's relationship to these issues is paramount. Through analysis of the reactions and emotions of individuals to environmental policy changes, the general public's relationship with Earth's environmental health can be revealed. This research examines the general opinions and reactions of the public on environmental policy measures in an attempt to understand how these measures affect the public perception surrounding legislation that has an impact on the environmental world around us.

David Bryce (Undergraduate Presenter), Tingting Zhao | Data science student at Bryant University

Talk title: Artificial Intelligence and Music: Analysis of Music Generation Techniques via Deep Learning and the Implications of AI in the Music Industry

Abstract: The use of artificial intelligence (AI) is quickly gaining relevancy in creative fields, and its emergence into the music industry comes with many unique implications. This paper examines the technical processes of creating music with AI and machine learning, the relationship between music and emotion, and finally the implications and ethical considerations for AI generated music in creative industries. As part of this project, a generative deep learning model (Music Variational Autoencoder) is explored and applied to generate music using a pre-trained training set of piano rolls. The AI reconstructions are based on self-made 4 measure electronic instrumental tracks. 46 students in Bryant University machine learning classes then take a survey to blindly compare the human generated tracks with the AI generated tracks to see if they can tell the difference. There are two trials of this survey, with a presentation on MusicVAE given in between the two trials. Exploratory analysis indicates that music experience is correlated with increased ability to distinguish AI generated music. Chi-Square Tests are then conducted for each set in each trial with a null hypothesis stating that the chance of guessing if a song is AI generated is equal to 50%. These results indicate that the null hypothesis cannot be rejected for the first trial, but that it is rejected for the second trial after the addition of the presentation in between.

Student Research Competition (Graduate Level) (AIC 130)

Sabrina Rao (Graduate Presenter) | Master of Data Science and Business Analytics Program at Bryant University

Talk title: Predicting Job Applicant Success Using Machine Learning

Talk abstract: In today's job market, businesses face the challenge of identifying the most suitable candidates during the hiring process. Simultaneously, students often wonder which features to emphasize on their resumes or highlight

during initial interviews. The ability to predict an applicants likelihood of success can significantly impact recruitment strategies. This study uses machine learning algorithms to assess whether an applicant will be accepted for a job. Specifically, we explore how an applicants coding background and computer skills influence their chances of success.

Jiwon Kim (Graduate Presenter) | Master Program at Bentley University

Talk title: Which SDG Goals are correlated to Higher Happiness?

Abstract: There are 983 data to reference countries with their track record of SDG goals and World Happiness Index scores from 2013-2022. Which of the SDG goals are correlated and statistically significant to higher national happiness? We want to offer some insights and recommendations for policymakers to consider when planning for their nation's future.

Nafise Aalipour (Graduate Presenter), Georges Tsafack | PhD student at University of Rhode Island

Talk title: Size Matters: Short-Term Momentum versus Long-Term Reversal Risk-Adjusted Returns in Investment Strategies

Talk abstract: Among the risk-adjusted portfolio performance measures, Sharpe Ratio is almost the most common one among both scholars and practitioners. Though its momentum effect has shown virtually small results over the future returns, the study of this measures reversal phenomenon has been overlooked in the literature. By taking 60 months of monthly and then 12 months of daily total returns into consideration, we calculate the Sharpe ratio for the US stocks traded between 1927 and 2022 for two investment horizons: long-term or one year and short-term or one month holding periods respectively. Then by constructing a zero-investment portfolio with taking a long and short position, we study the momentum and reversal effect of this performance measure on future returns. Our analysis shows that taking both returns and risk into consideration size matters such that the short-term momentum works for medium and large market cap stocks, while long-term reversal favors small ones.

Liam Smith (Graduate Presenter) | Master of Data Science Program at Bryant University

Talk title: Civilian Complaints Against NYPD, Analysis and Predictions

Talk abstract: This study delves into civilian complaints against NYPD officers, drawing from a dataset of over 32,000 allegations sourced from the NYPD via ProPublica. Through meticulous data manipulation and advanced analytics techniques, we scrutinize officer details, complainant demographics, and incident characteristics to discern patterns in civilian complaints and their impact on officer careers. Notably, a predictive model is developed to forecast career trajectory post-incident, particularly in terms of rank changes. Our findings offer insights into the complex dynamics between civilian complaints and officer career progression, contributing to discussions on accountability and procedural justice within law enforcement. Despite inherent limitations, this study represents a significant step towards understanding and addressing challenges facing contemporary policing.

Sai Sahithi Neela, Bharatendra Rai (Graduate Presenter) | Master Program at UMass Dartmouth

Talk title: Analysis of Detecting Fraudulent Financial Transaction Algorithms

Talk abstract: Financial fraud is a significant problem for the banking and financial industries since it greatly affects consumers and financial institutions. This study aims to tackle the issue of fraudulent transaction identification using a comprehensive methodology that blends data mining, natural language processing (NLP), and graph computing techniques. The study involves the examination of a vast amount of transaction data to detect patterns that may indicate fraudulent behavior.

To compare how well different machine learning algorithms detect financial fraud, this study will assess them all in the context of graph computing. We will implement and analyze a variety of algorithms, including supervised learning strategies like decision trees, random forests, and support vector machines, as well as unsupervised learning strategies like clustering and anomaly detection. These algorithms' performance will be evaluated using metrics like F1-score, accuracy, precision, and recall.

The study will also go over each method's benefits and drawbacks to shed light on how each might be used in various

situations. This study compares the effectiveness of various machine learning algorithms to determine which method is best for identifying kinds of financial fraud. The results will aid in the creation of fraud detection systems that are more successful and assist financial institutions in making wise decisions when battling financial fraud.

Mohit Bansal (Graduate Presenter) | Master Program at Babson College

Talk title: Demystifying Fear of Failure

Talk abstract: Fear of Failure: A Multifaceted Barrier to Entrepreneurship:

The study leverages a combined approach of in-depth literature review and machine learning analysis to comprehensively explore fear of failure as a significant barrier to entrepreneurial activity. Utilizing the Global Entrepreneurship Monitor (GEM) data and news articles, the research employs machine learning techniques to identify how individual characteristics (e.g., self-efficacy), aspirations (e.g., desired level of success), and the broader entrepreneurial ecosystem interact with fear of failure. The analysis delves into the multifaceted nature of this psychological construct, revealing that while fear of failure can deter initial entry into entrepreneurship, it can also motivate increased investment under specific conditions. The interplay between fear of failure and entrepreneurial ambition emerges as a crucial factor. Furthermore, the research emphasizes the importance of social context, demonstrating how exposure to successful entrepreneurs and supportive environments can mitigate fear of failure. Additionally, the study explores the moderating effects of cultural norms and economic freedom on the impact of fear of failure. Countries with robust entrepreneurial ecosystems and higher economic freedom offer more safety nets in case of failure, consequently reducing its paralyzing effect. By drawing on research on responsive avoidance motives, the analysis concludes by demonstrating how fear of failure, triggered by perceived obstacles, can significantly impact opportunity evaluation and pursuit by nascent entrepreneurs.

This comprehensive investigation offers valuable insights for researchers and policymakers seeking to cultivate a more supportive environment that empowers individuals to overcome the fear of failure barrier and pursue their entrepreneurial aspirations.

Kejing Hu; Gaoyang; Yihao Li (Graduate Presenter) | Master Program at Bentley University

Talk title: Innovative Small Business Credit Assessment

Talk abstract: To enable lenders to enter the market of small businesses which is underserved due to limited financial histories but represents 44% of the country's GDP, our project has developed an innovative data-driven credit assessment model that enhances lenders' ability to assess the creditworthiness of underserved small businesses, overcoming the traditional reliance on credit scores.

Considering data privacy, we trained logistic regression and decision trees using publicly available data from 3,754 small business loan applicants to SBA 7(a) program in 2020-2023. We selected the best model which can predict whether a loan will be paid in full with an accuracy of 94%. This model identified the initial interest rate and loan term have significant impact on the loan outcome. And the model in application shows adjusting the two factors can reduce default risk. The project also pinpointed opportunities for refinement, particularly in expanding data sources and addressing limitations to enhance predictive accuracy. By advancing financial inclusion and presenting a scalable credit assessment methodology, our work proposes a transformative tool for lenders and small businesses alike, aiming to create a more equitable financial landscape.