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2025 Analytics Without Borders Conference



Co-sponsored by



2025 Analytics Without Borders Conference Program

Hosted by: Center for Analytics and Data Science-Data Analytics Research Team (CADS-DART) and Department of Mathematical Sciences of Bentley University

Location: Bentley University Campus

Date: April 4th (Friday), 2025

Summary of Schedules

The 8th Analytics Without Borders Conference Schedule

Start	End	Main Track (Wilder Pavilion AAC 165)			
8:20	9:00	Check-in, breakfast and coffee	Track 1 (Research talks) at Lin26A	Track 2 (Research talks) at Lin28	Tutorial Session at AAC141
9:00	9:05	Opening announcement and instructions			
9:05	9:20	Welcome speech by Sanjay Putrevu, Business Dean of Bentley University			
9:20	10:20	Keynote by Sheamus McGovern The AI Workforce: How AI is Reshaping Business and Analytics			
10:30	11:20	Morning Career Panel: The Analytics Job Market (Moderator: Luke Cherveney)	1A (Chair: Tony Ng)	2A (Chair: Jiaying)	10:50am-12:20pm host by Nathan Carter
11:30	12:20	Major talk By Victor Lo Essential Business Analytics Topics in the Era of AI - from Industry Perspectives	1B (Chair: Moinak Bhaduri)		
12:20	13:20	Lunch break			
13:30	14:20	Afternoon Career Panel: Career Paths in Analytics (Moderator: Luke Cherveney)	1C (Chair: Mingfei Li)	2C: (Chair: Moinak Bhaduri)	
14:30	15:20	Poster session reviews and Coffee hours			
15:30	16:30	Keynote by John Chan Navigating the Future: AI's Transformative Role in Pharmaceutical Data Science and Business Analysis.			
16:30	16:40	Closing announcement Nicholas College and student competition award			

All time are Eastern Time Zone

Main Track at Wilder Pavilion

9:00am-9:05am: Opening announcement and instructions by Mingfei

9:05am-9:20am: **Welcoming remarks by Dr. Sanjay Putrevu, Business Dean of Bentley University,**

9:20am-10:20am: **Keynote 1**

The AI Workforce: How AI is Reshaping Business and Analytics

by Sheamus McGovern, Founder - ODSC, Venture Partner and Head of AI - Cortical Ventures

Introducer: Nathan Carter, Head of CARDS, Bentley University

10:30am-11:20am: **Morning Career Discussion Panel: The Analytics Job Market**

Moderator: Luke Cherveney

Panelists:

Allison Mega (DraftKings, Talent Acquisition Specialist)

Emma Zhou (Boston Scientific, Senior Data Science & AI Manager)

Gina Salcedo Lannin (Takeda, Senior Manager of Business Analytics and Insight)

Rachel White (Bentley University, Associate Director of Graduate and Alumni Career Development)

11:35am-12:25pm: **Major Talk**

Essential Business Analytics Topics in the Era of AI - from Industry Perspectives

by Victor S.Y. Lo, SVP, Data Science & AI, Fidelity Investments

Introducer: Greg Vaughan, Bentley University

12:20pm-13:20pm: Lunch Break: General audience Lunch box at Wilder Pavilion

Invited speakers and panelists at AAC 340

13:30pm-14:20pm: **Afternoon Career Discussion Panel: Career Paths in Analytics**

Moderator: Luke Cherveney)

Panelists:

Deepa Chandrachud (Fidelity, Senior Analyst)

Elif Kaya (Chewy, Data Scientist)

Ying Wu (Boston Scientific, Senior Data Scientist)

14:30pm-15:20pm: **Poster session, social and coffee hours Lobby near AAC 141**

15:30pm- 16:30pm: **Keynote 2**

Navigating the Future: AI's Transformative Role in Pharmaceutical Data Science and Business Analysis.

by John Chan, Head of ShinrAI Center for AI and Machine Learning, Takeda

Introducer: Mingfei Li, Professor, Bentley University

16:30pm- 16:40pm: **Announcement Student Research Competition Award** by the Award Committee

Closing Speech by Kevin Menzer, Dean of Data Science, Nichols College

Parallel sessions Track 1 at Lindsay 26A

10:30am-11:20am: Track 1A (Chair: Tony Ng, Bentley University)

1. **10:30 – 10:50: Measuring Brand Impact in Sports: A Brand Lift Study on Live TV Viewership and Media Strategies by Elizaveta Borisova, IPG Mediabrands**
2. **10:55 – 11:20: Robust Transfer Learning Strategies in Health Data Analysis by Mengyan Li, Bentley University**

11:30am-12:20pm: Track 1B (Chair: Moinak Bhaduri, Bentley University)

1. **11:30 – 11:50: Drifting Upward: Trends in Sodium Intake Extremes Among US Adults, NHANES 2003–2018 by Yutong Chen, Tufts University**
2. **11:55 – 12:20: Should students ask AI for help with math proofs? by Omeed Tavakoli, Bentley University**

13:30pm-14:20pm Track 1C (Chair Mengyan Li, Bentley University)

1. **13:30 – 13:50: Hypertension a predictive risk factor on progression to Alzheimer's disease using APOEε4 as a benchmark by Mingfei Li, Bentley University**
2. **13:55 – 14:20: Trends in AI News: An Analysis of Topic Modeling and Public Emotion by Suhong Li, Bryant University.**

Parallel sessions Track 2 at Lindsay 28

10:30- 11:20: Track 2A (Chair: Jiaying Weng)

1. **10:30 – 10:50: CEOs, Complementarities, and Firm Performance by Stefan Maric, Bentley University**
2. **10:55 – 11:20: Automatic Graders for Excel assignments by Sonia Gantman, Bentley University**

13:30- 14:20: Track 2C (Chair: Moinak Bhaduri)

1. **13:30 – 13:50: The Impact of Visualizing Data on IT at Boston Dynamics by Madison Slattery, Boston Dynamics**
2. **13:55 – 14:20: Smoke or Fire? How Disclosure Uniqueness Predicts Future Strategic Moves and Influences Firms' Information Environment by Phoebe Yu, Bentley University**

Presentation Abstracts

Keynote 1

The AI Workforce: How AI is Reshaping Business and Analytics

Speaker: Sheamus McGovern, Founder - ODSC, Venture Partner and Head of AI - Cortical Ventures

Abstract:

AI is no longer just a tool—it is becoming an integral part of the workforce, fundamentally reshaping how businesses operate, how decisions are made, and how analytics and data science evolve. This represents a shift to augmentation, where AI functions as a collaborative partner, enhancing human capabilities rather than replacing them. As AI takes on more responsibilities, it increasingly behaves like an AI employee—capable of executing tasks, generating insights, and working alongside human teams.

Yet, while AI's potential is huge, businesses often misunderstand its challenges. Many underestimate the complexity of engineering, the (current) need for systematic prompting, and the compute power required to sustain it. The simplistic narrative of AI "replacing jobs" fails to capture what's actually happening: a granular redistribution of tasks that demands we rethink traditional work patterns.

To stay relevant, organizations and professionals should embrace AI's rapidly evolving capabilities - from reasoning models that can tackle complex problems to agentic systems that autonomously manage workflows. Those who develop fluency with these emerging AI advancements won't just adapt to change - they'll drive it. The future demands a deep understanding of where AI adds value and where human intuition remains indispensable. Ultimately, the future of work is not about humans or AI alone—it's about how we build systems where both thrive together

Speaker's Bio:

Sheamus McGovern founded ODSC (The Open Data Science Conference), one of the world's leading AI conferences and communities. He also serves as a Venture Partner and Head of AI at Cortical Ventures, a venture fund focused on advancing AI and machine learning innovation. Prior to founding ODSC, Sheamus had a diverse career as a data engineer, software architect,, and AI expert. His professional journey began in finance, where he worked for leading financial institutions and quantitative hedge funds. Over the years, he has consulted with startups and enterprises in finance, healthcare, and eCommerce, helping develop cutting-edge, data-driven applications and AI solutions. Sheamus holds degrees from Northeastern University, Boston University, and Harvard University, as well as a Certificate in Quantitative Finance (CQF).

Keynote 2

Navigating the Future: AI's Transformative Role in Pharmaceutical Data Science and Business Analysis.

Speaker: John Chan, Head of ShinrAI Center for AI and Machine Learning, Takeda

Abstract:

As artificial intelligence continues to transform industries, its impact on pharmaceuticals is both significant and extensive. This talk examines how AI is reshaping the roles of data scientists and business analysts in drug development. We will explore the evolving nature of these roles, identifying functions being automated and highlighting emerging opportunities for future professionals. Additionally, we will explore the skills data scientists and business analysts may need to cultivate to adapt and thrive in this rapidly changing landscape.

Speaker's Bio:

John Chan is a technology executive, trained as a scientist and engineer, with over 25 years of industry experience in computational sciences and informatics. He has led computational teams, built informatics capabilities, and translated ideas into products for global biopharma and biotech start-ups. He is currently the head of the ShinrAI Center for AI and Machine Learning at Takeda. Prior to joining Takeda, John built a neuroscience AI company, Syllable Life Sciences, and as its CEO, led its acquisition by Neumora. Before Syllable, John held several contributor and management roles in computational biology, bioinformatics, and enterprise IT. This includes tenure as a visiting scientist at the Broad Institute, an Executive Director and Head of Informatics and Technology at Novartis, and the Head of computational biology at Millennium Pharmaceuticals, where he led the innovative team that fueled Millennium's drug discovery partnerships. John earned a B.Sc. in population genetics from Marlboro College and a Ph.D. in genetics and molecular biology from the University of Pennsylvania.

Major Talk

Essential Business Analytics Topics in the Era of AI - from Industry Perspectives

Speaker: Victor S.Y. Lo, SVP, Data Science & AI, Fidelity Investments

Abstract

Business analytics and data science have never stopped growing in this age of AI and Big Data. The academic literature covers important analytics areas from the research perspectives. In this talk, I will introduce key business analytics and data science topics from the industry points of view in the era of AI. These topics are important for meeting business and industry demand today and also for education and career development. Additionally, our discussion may be useful for academic researchers interested in industry applications.

Speaker's Bio:

Victor S.Y. Lo is a Big Data, Analytics, Marketing, and Finance leader with over three decades of extensive consulting and corporate experience employing data-driven solutions in a wide variety of business areas, including Customer Relationship Management, Market Research, Advertising Strategy, Risk Management, Financial Econometrics, Insurance, Product Development, Transportation, Healthcare, Operations Management, and Human Resources. He is a pioneer of uplift modeling, a subfield of data science. Victor has led data science and analytics teams in multiple business units at Fidelity Investments for over two decades, and is currently SVP, Data Science & AI in Workplace Investing at Fidelity. He has pioneered many analytics practices such as marketing mix, uplift modeling, causal inference, quantitative risk analytics, healthcare analytics, and AI ethics. Prior to Fidelity, he was VP of Modeling and Analysis at FleetBoston Financial (now Bank of America) and Senior Associate at Mercer Management Consulting (now Oliver Wyman). Victor earned a master's degree in Operational Research and a PhD in Statistics, and was a Postdoctoral Fellow in Management Science. For academic services, he has been serving on the board of the National Institute of Statistical Sciences (NISS)

and the Steering Committee of the Boston Chapter of INFORMS (Institute for Operations Research and the Management Sciences), and also on the editorial boards of three academic journals including Harvard Data Science Review (HDSR) and Frontiers in AI. Additionally, he is publishing a graduate level textbook on causal inference in business (Cause-and-Effect Business Analytics and Data Science) with co-authors and has been active in research on AI ethics, causal inference, design of experiments, and prescriptive analytics.

Parallel track talks

Measuring Brand Impact in Sports: A Brand Lift Study on Live TV Viewership and Media Strategies

Author(s) Elizaveta Borisova, Senior Analyst, Business Intelligence, IPG Mediabrands

Abstract

This ongoing research examines the effectiveness of paid and institutional media campaigns for a major sports client across different tentpole events, each varying in media budget and channel allocation. By measuring key performance indicators (KPIs) such as brand awareness, favorability, tune-in intent, and tentpole emotion, we aim to assess the impact of advertising efforts. Partnering with a third-party survey data provider, we used log-level exposure mapping and post-survey response tracking to evaluate campaign performance.

Using a randomized control vs. exposed group methodology, we ensured demographic representation of the target audience. Brand lift was calculated as the percentage-point increase from the control baseline, with adjustments for natural shifts in brand sentiment. Statistical significance was set, with confidence intervals reported to account for variability. However, external factors such as competitor activity and seasonality (especially during election periods) can influence results and are considered in our analysis.

A key focus of this study is Live TV viewership trends. The survey question on viewership received over 6,500 responses for the Postseason 2024 campaign. To standardize and categorize responses, we used Python for text processing and Fuzzy Matching in Excel, grouping them into major sports leagues and other popular TV genres (news, drama, game/competition shows). The study highlighted the top three most frequently mentioned programs in each of the ten most-watched categories, providing insights into audience preferences.

By analyzing data from multiple tentpole events, this research examines how varying media investments influence brand lift. These insights help refine audience targeting, optimize media strategies, and account for external factors that shape campaign effectiveness.

Drifting Upward: Trends in Sodium Intake Extremes Among US Adults, NHANES 2003–2018

Author(s) Yutong Chen, Jingyan Wang, Kristin E Leonberg, Kenneth Kwan Ho Chui, Lynne Ausman, Elena N. Naumova

Abstract

Introduction

Global dietary sodium studies often focus on mean intake, potentially overlooking critical shifts at the extremes of consumption. However, analyzing extremes is essential for identifying vulnerable populations and developing targeted nutritional interventions. This study examined temporal trends in sodium intake extremes among U.S. adults, utilizing both individual- and population-level analyses from the National Health and Nutrition Examination Survey (NHANES), 2003–2018.

Methods

We analyzed sodium intake distributions at individual and population levels, stratified by age, sex, and health status (cardiovascular diseases, heart attack, stroke, hypertension). Individual-level analyses employed four regression models incorporating linear and quadratic terms for survey cycle and age to identify significant temporal trends in sodium intake. Population-level analyses examined percentile sequences (min-P5-P10-P25-P50-P75-P90-P95-max) to identify shifts in sodium consumption patterns over time.

Results

Individual-level models demonstrated statistically significant temporal shifts in sodium consumption patterns from 2003–2018 ($\beta=20.38$ mg/day/year, $SE=4.19$, $p<0.001$). Population-level analyses revealed mixed significance: lower intake percentiles (P5, P10, P25) remained stable or showed non-significant trends, while upper percentiles (P75, P90, P95, and maximum) displayed significant increases ($p<0.05$). Specifically, the upper tail of the sodium intake distribution shifted upward, indicating more extremely high intake patterns over time. Among adults with hypertension, changes were even more pronounced, highlighting heightened risk within this vulnerable group (P75: $\beta=44.11$ mg/day/year, $SE=14.34$, $p=0.02$; P90: $\beta=43.77$ mg/day/year, $SE=14.26$, $p=0.02$; P95: $\beta=51.97$ mg/day/year, $SE=13.85$, $p=0.01$). These significant shifts suggest considerable cumulative increases in sodium intake across the 16-year study period.

Discussion

Our findings underscore the importance of monitoring extreme dietary sodium intakes and demonstrate significant shifts in consumption, especially at higher intake levels. Targeted public health interventions should account for these evolving patterns, particularly among populations at elevated risk.

Automatic Graders for Excel assignments

Author(s) Sonia Gantman, Accounting Faculty, Bentley University

Abstract

In 2023 a graduate student working with Accounting Department in Bentley University developed an Alteryx-based automatic grader for one of our Excel assignments. It was his initiative, not a class or job requirement.

After working with this autograder, I offered building automatic graders for other Excel-based assignments as a project in the advanced analytics class of our Master of Accounting Analytics program. Two teams were working on automatic graders in the Spring 2024 semester, and three other teams are working on them this semester.

In my presentation I will give an overview of a generic automatic grader, and touch on some challenges that I am facing when working with the students' teams.

Keywords: Alteryx, Excel, automatic grading

Robust Transfer Learning Strategies in Health Data Analysis

Author(s) Mengyan Li, Assistant professor, Bentley University

Abstract

Due to the heterogeneity and imbalance across different patient cohorts, robust transfer learning strategies are in high demand to improve risk prediction accuracies for underrepresented patient sub-populations and understudied diseases. We propose a Semi-supervised Triply Robust Inductive Transfer Learning (STRIFLE) approach, which integrates heterogeneous data from a label-rich source population with a label-scarce target population and utilizes a large amount of unlabeled data simultaneously to improve learning accuracy in the target population. This approach is adaptive to the varying levels of heterogeneity between two populations and is robust against potential model misspecifications. These desirable properties are established theoretically and verified in finite samples via extensive simulation studies. We utilize the STRIFLE estimator to train a Type II diabetes polygenic risk prediction model for the African American target population by transferring knowledge from electronic health records linked to genomic data observed in a larger European source population.

Hypertension a predictive risk factor on progression to Alzheimer's disease using APOEε4 as a benchmark

Author(s) Mingfei Li, Bentley University

Abstract

Comorbidities such as hypertension and hypercholesterolemia are risk factors associated with Mild Cognitive Impairment (MCI) and Alzheimer's disease (AD). The most significant genetic risk factor is the ε4 allele of the apolipoprotein E gene (APOE). The aim of this paper is to determine whether hypertension is the most significant but modifiable risk factor to delay AD onset. A cohort of patients with MCI (N=3052) is developed from the documented database (N=43,999) within the National Alzheimer's Coordinating Center (NACC) during the time period from June 2005 to May 2021. Cox proportional hazard models with propensity score weights on demographic information and comorbidities at baseline are applied to examine association of hypertension and hypercholesterolemia with AD onset among MCI patients. Associations are compared to APOE genotypes and AD onset. In addition, the association of hypertension with decline rates of Mini-Mental State Examination (MMSE) scores are reported. After controlling for age, sex, race, APOEε4 and reported comorbidities, MCI patients subsequently developed hypertension within 18 months after their first diagnosis of MCI have a significantly higher risk of AD onset (HR=2.77, 95%CI (1.66, 4.65), p value <0.0001), compared to MCI patients with no hypertension or a late occurrence of hypertension after 18 months. This significant association is validated through a Random Forest method, a machine learning approach with bootstrap simulations. In addition, patients with early hypertension have significantly higher MMSE score declining rates, compared to those without hypertension (coefficient=0.988, p=0.0054.). Hypertension is the most significant risk factor comparable to the genetic risk factor APOEε4 allele. Our finding is unique, as we did not observe a similar outcome from those with early hypercholesterolemia. Thus, among all comorbidities, hypertension is the most significant risk factor similar to the genetic risk factor APOEε4 allele.

Keywords: Alzheimer's Disease, Mild Cognitive Impairment, Hypertension, Hypercholesterolemia, APOE

Trends in AI News: An Analysis of Topic Modeling and Public Emotion

Author(s) Suhong Li, Professor of Information Systems and Analytics, Bryant University

Abstract

This research examines AI-related news articles published between 2022 and 2024 to identify dominant themes in public discourse. The study employs BERT-Base-NER for named entity recognition, Latent Dirichlet Allocation (LDA) for topic modeling, and fine-tuned SBERT for emotion analysis. Results indicate that the most frequently mentioned entities in AI News Articles include Google, Microsoft, OpenAI, the United States, ChatGPT, China, Nvidia, Apple, Meta, and Amazon. Topic modeling reveals five key themes: generative AI and big tech; semiconductor advancements and market growth; geopolitics and security; AI's societal impact, and AI-generated content and legal rights. In addition, emotion analysis highlights surprise and happiness as the most prevalent sentiments. The study further demonstrates that both topics and emotions evolve over time, offering insights into shifting narratives surrounding AI.

Keywords: AI, Natural Language Processing, Topic Modelling, Emotion Analysis

Comparative Analysis of Interbank Interest Rates in Developed and Emerging Countries by

Author(s) Reuben Brefo Marfo, PhD student, Bentley University

Abstract

This paper presents a comprehensive analysis of interbank interest rates across Developed (Canada, UK, Australia & South Korea) and emerging (South Africa, Mexico, Brazil & Chile) economies using the Cox-Ingersoll-Ross (CIR) and Vasicek models. The study reveals that emerging markets exhibit higher long-term means, greater volatility, and slower mean reversion compared to developed markets, highlighting the inherent risks and instability in these economies. A

comparison of interest rate distributions between emerging and developed further underscores these differences, with emerging economies showing significantly more variability.

CEOs, Complementarities, and Firm Performance

Author(s) Stefan Maric - Bentley University, Robert M. Wiseman - Michigan State University, Adam A. Oppenheimer - University of Minnesota

Abstract

We demonstrate that CEO-firm complementarities—not just CEO ability—are a critical driver of firm performance. Using a comprehensive panel of over 17,000 CEOs from the entire Compustat universe (1990--2018) and leveraging the Bonhomme, Lamadon, and Manresa (BLM) structural econometric estimator based on machine learning to disentangle CEO, firm, and match-specific effects, we find that complementarities account for approximately 5% to 7% of the performance variance, compared to 2% to 4% for CEO ability. Counterfactual simulations suggest that enhancing CEO-firm alignment could increase aggregate market valuations by as much as 35.9% (approximately \$20.7 trillion). These findings challenge the traditional emphasis on CEO ability as the primary source of influence, revealing substantial economic costs from misallocations and highlighting the pivotal role of contextual fit. By demonstrating that the effectiveness of a CEO's traits depends on the firm's unique characteristics, our study bridges the gap between Upper Echelons Theory and competitive assignment models. In doing so, it underscores that strategic, context-driven matching of CEOs to firms is integral to unlocking organizational value.

Keywords CEOs, Variance decomposition, Complementarities, Structural estimation

The Impact of Visualizing Data on IT at Boston Dynamics

Author(s) Madison Slattery, Business Systems Analyst, Boston Dynamics

Abstract

This presentation explores the transformative impact of data visualization on the IT department at Boston Dynamics. By utilizing Tableau to bring the data to life visually, the department has significantly improved annual goal setting and tracking, increased visibility of IT performance for end users, and enhanced overall team efficiency. This session will highlight specific examples and demonstrate how data visualization has empowered IT leaders to gain deeper insights, make faster decisions, and ultimately drive greater value for the organization.

Should students ask AI for help with math proofs?

Author(s) Omeed Tavakoli, Gabrielle Friedman, Nathan Carter, Bentley University

Abstract:

As AI becomes more integrated into education, it is critical to assess how effectively different models can evaluate student work in subjects that demand precision, such as mathematics. This study compares two language model approaches: one is a specialized model designed for mathematical reasoning and prompted with detailed, technical instructions; the other is a general-purpose chatbot responding to simpler, student-style queries. Expert human grading served as the benchmark for evaluating each model's accuracy, error detection, and consistency across a range of mathematical topics. While the specialized model showed stronger performance, both models demonstrated significant limitations. The results suggest that current AI systems are not yet reliable enough for autonomous grading and require further refinement before they can be responsibly used in educational settings.

Smoke or Fire? How Disclosure Uniqueness Predicts Future Strategic Moves and Influences Firms' Information Environment

Author(s) Phoebe Yu, PhD student, Bentley University

Abstract

This study examines whether unique language in firms' mandatory disclosures reflects real private information or managerial spin. I construct two measures of disclosure uniqueness using advanced Natural Language Processing (NLP) tools: one capturing "unique topics" absent in industry peers' filings, and another measuring "within-topic uniqueness," or how differently a firm discusses common themes. Using BERTopic and GPT-4 to classify unique textual segments, I find that uniqueness predicts future strategic moves such as M&A and innovation, suggesting it often signals genuine firm plans. Analysts and investors who incorporate these signals show improved forecast accuracy and market liquidity, while disclosures lacking clear strategic ties have weaker or negative effects. These results highlight how non-boilerplate language can reveal emerging strategies, offering insights for both regulators and investors.

Keywords: Natural Language Processing, Large Language Models, Textual Analysis, Corporate Disclosure, Analyst Forecast, Market Liquidity