Annual Report

2023-24

Brij Disa Centre for Data Science and Artificial Intelligence

IIMA

INDIAN INSTITUTE of MANAGEMENT AHMEDABAD

विद्याविनियोगाद्विकास:


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Foreword

The Brij Disa Centre for Data Science and Artificial Intelligence navigated a transformative 2023, a year of expansion and contribution, filled with dynamic activities, rigorous research endeavors, and impactful partnerships. These initiatives were aimed at advancing the frontiers of Data Science and Artificial Intelligence (AI) and their applications across diverse domains such as Education, Healthcare, and the Future of Work.

In this Annual Report, we are delighted to present a comprehensive overview of our key accomplishments, pioneering projects, and strategic initiatives, underscoring our commitment to research and knowledge dissemination in the realm of Data Science and AI.

AI and the changing employment landscape

In an era where the transformative potential of AI reverberates across global economies, the centre is currently studying its impact on the Global South, particularly for India. Led by principal investigator Prof. Anindya Chakrabarti with Prof. Ankur Sinha and Prof. Aditya Moses as co-investigators, the centre has studied the supply and demand side of the Indian ecosystem. The upcoming report aims to quantify the impact of AI on the job market and the changing nature of emerging roles in India. For this report our team has gathered multi-faceted insights from job-search platforms, leadership interviews and extensive online surveys. Our research aims to furnish actionable insights crucial for aligning the workforce supply with future demand, informing policy decisions, and ensuring that AI innovations lead to inclusive growth.

Fostering cutting-edge research at the intersection of data science and management

The centre has nurtured a diverse portfolio of projects across different management areas, resulting in research publications by Professors as well as by Post Doctorals at the centre. Our exceptional postdoctoral researchers—Dr. Neaketa Chawla (Ph.D in Economics, IIT Delhi), Dr. Dhaval Pujara (Ph.D in Operations, IISC Bangalore), and Dr. Arzoo Narang (Ph.D in Mathematics, IIT Ropar) have made significant contributions to both theoretical and applied research in DSAI, further enriching IIM Ahmedabad's research capabilities.

Following pages highlights centre’s research into AI’s role in job transformation, evolving skill requirements, and optimizing data science applications across sectors. The centre's innovative projects include hyperparameter tuning, AI's effectiveness in debt collection, and dynamic rewards in creative crowdsourcing, reflecting its commitment to cutting-edge research in data science and AI.

Supporting social impact through collaborative endeavours

Our collaboration with Saajha, an esteemed NGO dedicated to improving learning outcomes in primary school-going children, exemplifies our commitment to leveraging AI for social good. The project led by Principal Investigator Prof. Ambrish Dongre with Dr. Chawla (Post Doc at Centre) has not only run interventions to transform the operations and engagement model of the NGO but has also furthered research at the intersection of AI and Education. This unique initiative has brought together faculty members from across disciplines to jointly push the frontiers of research in Education using data science. The tangible progress is being meticulously documented in research papers and an upcoming case study, testament to the profound impact of collaborative endeavors in driving meaningful societal change.

Knowledge dissemination and fostering research

Our steadfast commitment to nurturing talent and fostering a vibrant research ecosystem finds expression through initiatives such as the Large Scale Optimization Workshop. Serving as a nexus for researchers from across India, this flagship event was hosted at IIT Kanpur in 2023. It has emerged as a pivotal platform for fostering interdisciplinary collaborations and amplifying research capabilities. Through immersive hands-on sessions, expert-led panels, and networking opportunities, participants are equipped with the requisite skills and insights to navigate the evolving landscape of data science and AI, all while upholding ethical imperatives and driving innovation.

The Centre's inaugural Workshop on Data Science and Artificial Intelligence was a resounding success, attracting participants from both industry and academia. This intensive workshop provided a platform for in-depth exploration of the latest AI advancements and best practices, fostering collaboration and knowledge exchange.

Examining India's current AI readiness

The centre launched its first report in collaboration with BCG X that brought together research and practitioner insights to evaluate the AI readiness of Indian organizations across three major sectors: Manufacturing, Consumer and Banking, Financial Services and Insurance (BFSI). The report evaluated 130+ organizations across multiple aspects and found that three out of four organizations are lagging considerably in adoption of AI.

As we embark on the next phase of our journey, we extend heartfelt gratitude to our stakeholders for their unwavering support and collaborative spirit, which have been instrumental in surmounting the challenges of the past year. We remain steadfast in our pursuit of pioneering research, eager to explore new frontiers and reaffirm our commitment to propelling India towards a knowledge-driven future. Here's to another year brimming with promise, resilience, and boundless opportunities for growth and impact.

About Us

The Brij Disa Centre for Data Science and Artificial Intelligence (CDSA) at the Indian Institute of Management Ahmedabad (IIMA) provides a common platform to faculty, scholars, and practitioners for conducting and disseminating cutting-edge research on data analytics and artificial intelligence that offers solutions applicable to business, governance, and policy.

Besides generating action-oriented insights, CDSA is also responsible for dissemination of the knowledge generated to a wider audience both within and outside the realm of the Institute. Seminars, workshops, and conferences are regular activities at the Centre, which are conducted to reach out to and engage with stakeholders.

The Centre aims to forge synergistic and collaborative relationships between scholars and practitioners in data-intensive organizations, besides undertaking case-based research to understand the current industry practice and develop case studies for classroom teaching.

Furthermore, through its collaboration with the industry, CDSA takes up challenging consulting projects of considerable practical importance. These projects are targeted at providing an opportunity for students to participate in projects that aim at outcomes that can further benefit the organization and the business, at large.

What We Do

The activities of the centre are five-fold through which the members of the centre engage with businesses, policy makers, students, and other academic institutions.

Academic Research

The centre supports and fosters academic research in the field of data science and AI.

Knowledge Dissemination

The centre disseminates research reports/findings to key stake holders including academics through a variety of channels viz., media outreach, participation in academic and professional conferences, authored articles, workshops, etc.

Industry Connect

The centre connects with the industry by collaborating with them in conducting workshops and seminars for the audience that is keen to track the progress of data science and AI in practice.

Consulting Activities

The centre facilitates businesses by connecting them with researchers who are working on cutting-edge problems and can help solve challenging business problems.

Data-driven Policy Enablement

Enable policymakers with reports on trends and progression of analytic tools, techniques and other resources

Centre Projects

The Impact of AI on Jobs and Skills in India

The world is witnessing an unprecedented surge in Artificial Intelligence (AI) adoption. This transformative technology promises significant advancements across industries, with the potential to boost productivity, fuel economic growth, and improve living standards. However, the integration of AI into the workplace also presents a complex set of challenges, particularly concerning its impact on jobs and skills.

PROF. ANINDYA CHAKRABARTI

Principal Investigator
Associate Professor of Economics

While studies suggest AI may augment rather than eliminate jobs entirely, the nature of work and required skill sets are likely to undergo significant changes. From task automation to data-driven decision-making, AI offers potential for increased efficiency and cost-reduction. However, concerns remain regarding potential job displacement and the widening of the digital divide between developed and developing nations. To navigate this evolving landscape effectively, proactive policymaking and research focused on AI's impact on the workforce are crucial.

By automating routine tasks, AI facilitates significant cost reductions and optimizes resource consumption, ultimately enhancing productivity. However, this automation will inevitably shift the workforce landscape across various sectors. Jobs will transform, requiring new skills and potentially leading to the need for reskilling initiatives. India, with its young and vibrant workforce, presents a fertile ground for AI adoption. The nation aspires to become a global leader in AI innovation, as evidenced by its top ranking in AI skill penetration according to the Stanford AI Index Report 2023. However, a comprehensive understanding of AI's specific impact on jobs and skills in the Indian context is critical. This research project aims to bridge this knowledge gap and provide valuable insights to policymakers, businesses, and the workforce itself. This report will explore the challenges, dilemmas, and opportunities surrounding AI's impact on jobs and skills in India.

Research method

To gain a comprehensive understanding of AI's impact on India's jobs and skills landscape, this research project employed a multi-pronged approach:

- **Business Leader Interviews:** In-depth discussions with 30 leaders across diverse industries provide valuable insights into the current and anticipated impact of AI on employment within their organizations.
- **Employee Surveys:** A representative sample of Indian employees participate in surveys to gauge their experiences with AI in both professional and personal settings. This data sheds light on employee perceptions, concerns, and potential opportunities arising from AI adoption.
- **Job Posting Analysis:** Analysis of 150,000 job postings across various platforms identified the new AI jobs and their characteristics within the Indian job market.

Main themes of inquiry	Principal queries	Research method
Identify technological change	• Understand the level of employee's use of AI technologies at work • Evaluate employee experience with AI-enabled tools	• Employee survey • Business leaders interviews
Study labor demand	• Quantify the AI exposure to occupations • Identify most affected demographics for potential replacement • Anticipate industries and sectors creating new jobs from AI adoption	• Employee survey • Job postings analysis
Study skill demand	• Evaluate the required skills and education for new jobs • Investigate skill gap and skill mismatch trends • Alternate learning models (online platforms, industry training programs) effectiveness in skilling	• Employee survey • Job postings analysis • Business leaders interviews

Impact of research

This timely research by the Brij Disa centre for Data Science and Artificial Intelligence delves into the critical issue of AI's impact on India's labor force. The forthcoming report, with its data-driven insights into the Indian workforce, promises to equip policymakers and business leaders with the knowledge needed to navigate this transformative era. By informing policy decisions on skilling initiatives and worker perceptions, the research can help ensure a smooth transition. Additionally, businesses will gain valuable insights to guide their strategic planning and investment in AI technologies. Understanding AI's impact will inform key decisions regarding workforce management, technology investment, and operational changes. Ultimately, this research has the potential to pave the way for an AI-driven future in India that fosters inclusive growth and maximizes human potential.

Currently the data collection and analysis is ongoing by the research team and the full report will be published in upcoming weeks for public discourse. Stay connected to get your copy of this impactful report curated by Brij Disa centre for Data Science and Artificial Intelligence.

Future of Work

Introduction

The study conducted by the Indian Institute of Management Ahmedabad, with Right Management India as the industry partner, delves into the evolving workplace dynamics driven by global economic changes and technological advancements. This report underscores the necessity for E-shaped employees, who are pivotal in managing the complexities of today's business environment.

PROF. ADITYA CHRISTOPHER MOSES
Principal Investigator
Assistant Professor of Human Resources Management

Adapting to Disruption

The workplace in India is undergoing a significant transformation due to technological progress and shifts in the global supply chain, further accelerated by the COVID-19 pandemic. This environment demands a workforce that is innovative, adaptable, and technologically skilled.

The Emergence of E-Shaped Employees

Traditional models of employee skills, characterized by deep expertise in one area and a broader knowledge in others, are no longer sufficient. The modern business landscape calls for E-shaped employees who combine deep expertise, execution capabilities, and the ability to engage across multiple disciplines, thereby unlocking new levels of collaboration and innovation.

Strategic Development of the E-Shaped Workforce

Organizations need to prioritize the development of behavioral competencies alongside technical skills. This involves role rotations to broaden employee perspectives, integration of e-learning to ensure continuous skill upgrading, and clear career pathways that align with organizational goals and employee aspirations.

Organizational Advantages of E-Shaped Employees

- Innovation and Competitiveness: E-shaped employees are crucial for driving innovation, helping organizations maintain competitiveness in a dynamic market.
- Operational Efficiency: These employees' ability to navigate various disciplines helps in streamlining processes and reducing organizational silos.
- Employee Engagement: Developing pathways for employees to become E-shaped aligns with their career aspirations, enhancing satisfaction and retention.

Conclusion

The cultivation of E-shaped employees is vital for organizations looking to thrive in an environment marked by continuous change. By investing in such talent, companies not only enhance their adaptability and innovation but also secure a competitive edge in the global marketplace. This strategic focus is essential for sustainable growth and long-term success in the evolving world of work.

Research Output

Moses, A. C. & Ghatak, D. (2024). Examining job redesign, reskilling initiatives, and their effects on employee engagement. In Academy of Management Conference 2024 (Chicago, IL)

Data Driven Research in Education

PROF. AMBRISH DONGRE

Principal Investigator
Assistant Professor of Ravi J. Matthai Centre For Educational Innovation

India has made rapid strides in ensuring access to primary schooling. Data from a variety of sources also suggests that the percentage of children in the age group of 6 to 10 years enrolled in school is near universal, and the drop-out rates are low. However, concerns about learning outcomes persist. It is well accepted that a large fraction of enrolled children are way below the level expected at the grade in which they are enrolled. Realizing the gravity of the problem, the National Education Policy (NEP) explicitly mentions Foundational Literacy and Numeracy (FLN) to be achieved by all children by Grade 3.

Saajha, a non-governmental organization, is attempting to tackle this challenge by focusing on the parents of children attending government primary schools, a relatively neglected stakeholder.

How does Saajha operate? First, it on-boards parents on its Whatsapp platform, either through meetings with parents in schools or through door-to-door visits. Once the parents are onboarded, Hindi and Math assessments of children are conducted over the telephone by a Saajhedar. This allows Saajha to share learning material (educational videos, worksheets) which are appropriate for the learning level of the child. This material is shared over Whatsapp and parents are expected to show this content to their children. Subsequently, periodic assessments are conducted to check whether the learning level of the child is improving.

Saajha has been facing a critical challenge. A significant fraction of parents drop out before the child improves her learning outcomes.

CDSA is collaborating with Saajha to design and implement multiple interventions to reduce this drop-out rate, and evaluate their impacts. Some of the interventions that were implemented are described below.

On-boarding: The current onboarding process involves field agents going door-to-door to enlist parents into the program. We experimented with the onboarding process by introducing the following two interventions- (i) **Product Demo:** We created a product demonstration video containing information on how Saajha's support might help improve the learning outcomes of children. The field agent used their phone to show this video to a prospective parent while requesting to on-board them, (ii) **Booklet:** Agents gave parents an informational booklet that contained similar information, including details about the assessment tool. Results from the experiment, however, showed that the interventions did not have the desired effect on parental engagement on the platform.

Digital rewards:. We also experimented with giving digital rewards and certificates of appreciation/ badges/ star points) to parents when (i) their child completed an assessment, and (ii) for viewing FLN activities shared over WhatsApp. Preliminary analysis indicates that such rewards can lead to marginal improvement in parental engagement in the short term but there is no sustained effect on such outcomes.

Source: https://www.saajha.org

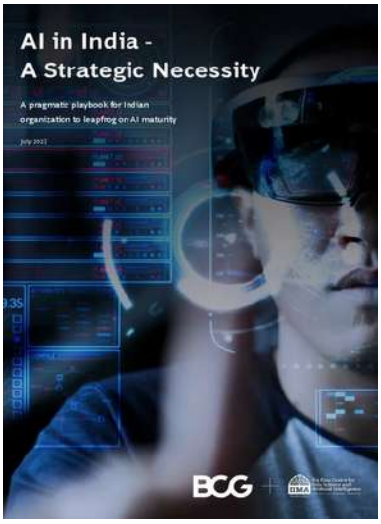
Request for Assessment: The telephonic assessments are conducted by full-time calling agents, who are part of the Saajha team. The historical data showed that agents typically needed to call on average, 4-5 times per parent to complete a single assessment of the child. This not only results in loss of time and efforts by agents, but also leads to delays in reaching out to parents who are interested in getting their child assessed. To address these multiple challenges, a Request for Assessment (RFA) feature was tested. This feature entailed sending a WhatsApp message with a 'Yes' button. The message asked parents to indicate whether they want to schedule their child's assessment within the next 24 hours. Our results indicated that parents who use this feature complete their child's assessment in fewer calls.

Volunteer Engagement: Calling agents call around 40-50 parents daily and complete approximately 10-12 telephonic assessments per day. Their average monthly salary is between INR 15-18 thousand per month. This forms a substantial portion of the variable cost to support one parent. One proposed solution to bring down the cost is to engage volunteers to conduct these assessments. Unlike full-time agents who receive fixed salaries, volunteers are compensated per resolved assessment. However, volunteers lack extensive training and experience of interacting with parents as compared to full-time callers which could adversely affect the quality of the assessments conducted over the telephone. Hence, an experiment was designed to test this trade-off.

IIMA – BCG study on AI Readiness

July 12, 2023: IIMA's Brij Disa Centre for Data Science and AI (CDSA) and BCG X, the AI and Digital Transformation unit of Boston Consulting Group (BCG) collaborated to release a comprehensive report titled "AI in India - A Strategic Necessity" on the AI readiness levels of Indian businesses.

The report findings are based on the study of 130 companies from the Banking, Financial Services, and Insurance (BFSI), Consumer Goods (CG), and Industrial Goods (IG) sectors, along with extensive interviews and surveys conducted on CXO's of large-sized, medium, and small organisations. The study objectively and holistically measures the ability of a company to leverage AI to drive its strategic objectives and enhance its financial and operational performance.



The report identifies 11 percent organisations as `Leaders', 9 percent as `Leapfroggers', 13 percent as `Steady Followers' and 67 percent as `Laggards' from a pool of large Indian companies across different sectors.

The report was released at the IIMA campus by Professor Bharat Bhasker, Director, IIMA, Professor Ankur Sinha, Professor Anindya Chakrabarti, Co-Chairs of the Brij Disa Centre for Data Science and Artificial Intelligence, Professor Arindam Banerjee, Debjit Ghatak, General Manager, Brij Disa centre for Data Science and AI, Sumit Sarawgi, Managing Director and Senior Partner, BCG, Deep Narayan Mukherjee, Partner and Associate Director - Data Science, Rajat Mathur, Partner, BCG, all co-authors of the report from IIMA and BCG respectively.

Releasing the study, **Professor Bharat Bhasker**, Director of IIMA, said, "India is poised to enter into a digital revolution where successful AI adoption by our industry can be a crucial determinant of India's competitiveness globally. Successful adoption of AI could add up to 1.4 percentage points annually to the real GDP growth of India. From the perspective of corporates, the successful adoption of AI is expected to add, over a five-year period, INR 1.5-2.5 trillion in incremental pre-tax profit for the top 500 Indian companies alone. This presents an incredible opportunity for the Indian industry. Our companies can leverage widespread internet access and cost-effective labour to move ahead and align themselves to the global AI maturity standards. I am confident that the joint study by the Brij Disa Centre IIMA and BCG will have significant implications for policymakers and industry leaders to foster a conducive ecosystem for adopting AI by Indian organisations and their success in translating it into business performance."

Professor Bharat Bhasker,
Director of IIMA

The report emphasizes the significance of achieving advanced AI maturity for success in today's business landscape. Sumit Sarawgi, Managing Director & Senior Partner, BCG commented, "Investments into AI could deliver extraordinary returns, but success hinges on deploying AI at scale. An organisation-wide commitment is required for successful AI-driven transformation of the organisation. The reason being the success from AI adoption, algorithms drive approximately 10% of the success, while data and technology infrastructure adds a further 20%. The remaining 70% hinges on people, processes, and business transformation."

The report provides key insights into India's corporate AI landscape and roadmaps in AI adoption. The study reveals that select Indian BFSI companies (mainly banks and new-age NBFCs) have very high AI Maturity, on par with global frontrunners. It divides companies into four groups based on their maturity level— leaders, steady followers, leapfroggers and laggards. 11% of companies in the set were adjudged leaders that now face a stiff challenge from the leapfroggers (9% of the companies) who started their AI-driven transformation journey late but have improved sharply in AI maturity in the last three years, converging with the Leaders on most aspects of AI maturity.

LSO 2023

The third edition of the Large Scale Optimization (LSO) Summer School and Conference, held from April 2-10, 2023, at the Department of Industrial and Management Engineering, Indian Institute of Technology Kanpur, continued its tradition of excellence in the realm of optimization. Collaborating with the Brij Disa Centre for Data Science and Artificial Intelligence, Indian Institute of Management Ahmedabad, the event attracted a diverse cohort of participants from academia and industry eager to delve into the intricacies of modern optimization methodologies.

Throughout the Summer School sessions, attendees immersed themselves in intensive tutorials focusing on essential decomposition techniques tailored to tackle the complexities inherent in Integer Programs/Mixed Integer Programs (IPs/MIPs). From Lagrangian Relaxation to Benders Decomposition, the curriculum aimed to equip participants with the necessary skills to navigate and solve challenging optimization problems prevalent across various domains, including Supply Chain, Logistics, and Machine Learning.

The subsequent colloquium provided a platform for researchers and practitioners to engage in lively discussions, fostering collaborations and exchanging insights on recent advancements in theory, computation, and practical applications in optimization. Culminating in a conference that seamlessly merged theoretical insights with real-world implementations, the event underscored its pivotal role in propelling the field of large-scale optimization forward, shaping the trajectory of research and practice in the years to come.

READ MORE HERE

Workshop on Data Science and AI - 2024

Workshop Chairpersons

Prof. Dhiman Bhadra
Associate Professor of Operations and Decision Sciences

Prof. Karthik Sriram
Associate Professor of Operations and Decision Sciences

The first edition of the Workshop on Data Science and Artificial Intelligence was conducted from April 9th to 15th, 2024, at the Brij Disa Centre for Data Science and Artificial Intelligence at the Indian Institute of Management, Ahmedabad. The summer school saw participation from more than 100 participants from both industry and academia and focused on upskilling them with knowledge about cutting-edge techniques in modern applied Statistics, Data Science, and Artificial Intelligence. Sessions covered essential concepts in Regression Analysis, Bayesian Analysis, Deep Learning and Neural Networks, Graphical models, Causal inference, Optimization, High-Dimensional Data, Text Mining and Sentiment Analysis. In-class learnings were supplemented with guest lectures from industry experts and participant experience sharing. The workshop was successful in developing a holistic understanding of the role of modern statistics in business and research among the participants.

Course Instructors:
Prof. Ankur Sinha, Prof. Samrat Roy, Prof. Diptesh Ghosh, Prof. Arnab Laha and Prof. Adrija Majumdar

Guest Speakers:
Deep Mukherjee (BCG), Kamiya Motwani (Walmart Global Tech) and Rahim Baig (Zalando - Germany)

Research Projects

Optimal Merkle Trees for Blockchain Transactions

PROF. SACHIN JAYASWAL

Professor of Operations and
Decision Sciences

Status: In progress

Summary: A Merkle tree, also called a hash tree, is a well-known tool to efficiently validate a data element in a set without revealing the entire set. It thus forms a critical component of blockchain technology as it enables secure validation of blockchain transactions. It stores the balance of each blockchain account as a hash value on its leaf nodes, which must be updated after each transaction. The efficiency of hash updates on a Merkle tree depends on the relative distribution of the accounts on the tree: as two accounts that frequently transact between them move closer to the root, fewer nodes need to be read and updated. In this work, we aim to develop an integer programming-based mathematical model for constructing a Merkle tree that can be efficiently updated. Further, we aim to develop algorithms to solve the resulting model efficiently.

Research Outputs:

1. Two integer programming (IP)-based mathematical models developed.
2. A Benders decomposition-based solution method developed; enhancements of the algorithm in progress.
3. Coding for the difference of Convex (DC) programs-based algorithm in progress.

Effects of Dynamic Rewards on Solver Efforts in Creative Crowdsourcing

PROF. SWANAND DEODHAR

Associate Professor of
Information Systems

PROF. SAMRAT GUPTA

Associate Professor of
Information Systems

Status: In progress

Summary: The study is on the nuanced impact of dynamic rewards in creative crowdsourcing. It shall include randomized trials during contests with dynamically adjusted rewards. It shall also combine dynamic rewards with feedback. This multifaceted approach aims to understand how variations in rewards, feedback, and their combination influence designer behavior, submission diversity, and solution quality. The study will also explore the implications of dynamic rewards and the increasing role of AI-based tools in evaluating creative submissions, contributing to discussions on optimizing creative crowdsourcing platforms.

Hiring for the Future – A People Analytics Approach

PROF. ADITYA CHRISTOPHER MOSES

Assistant Professor of Human Resources Management

Status: In progress

Research 2 - Accepted AOM Conference 2024
Research 1 - Accepted EGOS 2023

Summary: The future of work is a critical aspect for many organizations. A 2020 report by the World Economic Forum suggests that among the various challenges faced by organization one of the most critical areas is skill gaps. They argue that skill gaps continue to remain high as in-demand skills across jobs change in the short term. The top skills and skill groups which employers see as rising in prominence in the lead up to 2025 include groups such as critical thinking and analysis as well as problem-solving, and skills in self-management such as active learning, resilience, stress tolerance and flexibility. On average, companies estimate that around 40% of workers will require reskilling of six months or less and 94% of business leaders report that they expect employees to pick up new skills on the job, a sharp uptake from 65% in 2018.

The changing nature of work and the exponential technology development imply that employees need to constantly re-skill and up-skill. In the current environment, while knowledge can be accessed via multiple sources the behaviours to develop oneself become more important. What behaviours will organizations require for ensuring they have a workforce that can reskill and upskill exponentially? This will be the primary area of research for this study.

Using a data-driven approach, this study uses surveys and NLP to understand which behavioural traits enable re-skilling at pace. We will employ text-mining methods and techniques to identify behavioural traits that help in re-skilling. The insights from this will be further validated and tested using a survey instrument administered to a large sample of individuals.

Research Ouputs:
1. 2 research papers in progress.
2. Industry report in progress.

Financial networks from big data: A multivariate time series based approach

PROF. ANINDYA CHAKRABARTI

UTI Chair in Macroeconomics
Associate Professor of Economics

Status: In progress

Summary: Financial markets exhibit non-trivial comovement and dependency structure. The standard approach in the finance literature is to consider the market in its aggregate form. A more recent 'data'-oriented approach emphasizes a more granular decomposition of the market so that the aggregate dynamics can be broken down into contributions arising from individual assets.

This leads to two analytical problems. First, one has to necessarily deal with a large amount of data such that the process scales with the volume of data (large N and large T where T>>N). Two, analyzing such a large volume of data requires toolkits which are at the intersection of econometrics and machine learning. In this project, the goal is to construct large scale financial networks based on multivariate time series data to capture the dynamics of the system. The main idea is to provide an algorithmic approach to convert time series into networks such that the properties of time series are also inherited by the resulting network. The spectral structure of the comovement network is known to capture, at least partially, the booms and busts in the markets. Here, we take up two specific problems.One, how reliably does the spectral structure reflect the system for the case where T~N. Two, a large chunk of the literature on networks construction depends on bivariate modelling which is subject to failure due to multiple hypothesis testing. Therefore, an imminent question is how to construct a network with a direct multivariate model.

Research Output:

1. A. Banerjee, A. Chakrabarti and A. S. Chakrabarti, The origin of return correlation network, revision requested at Journal of Complex Networks.
2. V. Garg, S. Kumar and A. S. Chakrabarti, Networks of financial volatility: Effects of expectation, (work in progress).

High-frequency trading: Measuring latency from big data

PROF. ANIRBAN BANERJEE

Assistant Professor of
Finance and Accounting

Status: Published

Link to the paper

Summary: Over the last decade, the Indian market has seen significant growth in algorithmic trading and more specifically, high-frequency trading (HFT) activity. During this period, we have witnessed a significant change in the trading landscape as presently close to half of the trading volume in the stock exchanges is contributed by algorithms. This rise has not always been smooth as there have been calls for regulations to restrict algorithmic trading activity due to the fear of probable market manipulation.

Latency is considered one of the most important market parameters for HFTs. Using a large novel dataset of order and trade level data from the NSE, we would like to inspect how the latency in the Indian market has changed and if that has caused any shift in the way HFTs operate. We would also like to observe how the different market quality parameters have evolved over this time.

Research Output:

1. Banerjee, A., & Roy, P., High-Frequency Traders' Evolving Role as Market-Makers, Economics of Financial Technology Conference, Edinburgh, Scotland, 2023
2. Banerjee, A., & Roy, P., Are HFTs Really Market-Makers?, India Finance Conference, IIM Calcutta, India, 2022

An iterative gradient-based bilevel approach for hyperparameter tuning in machine learning

PROF. ANKUR SINHA

Associate Professor of Operations and Decision Sciences

Status: Published

Link to the paper

Summary: Hyperparameter tuning in the area of machine learning is often achieved using naive techniques, such as random search and grid search that only lead to an approximate set of hyperparameters. Although techniques such as Bayesian optimization perform an intelligent search on the domain of hyperparameters, it does not guarantee an optimal solution. A major drawback of most of these approaches is that as the number of hyperparameters increases, the search domain increases exponentially, thereby increasing the computational cost and making the approaches slow. The hyperparameter optimization problem is inherently a bilevel optimization task, and there exist studies that have attempted bilevel solution methodologies for solving this problem. These techniques often assume a unique set of weights that minimizes the loss on the training set. Such an assumption is violated by deep learning architectures. Our study is on gradient-based bilevel optimization method for solving the hyperparameter optimization problem. The method is general and can be easily applied to any class of machine learning algorithms that involve continuous hyperparameters.

Research Output:

A gradient-based bilevel optimization approach for tuning regularization hyperparameters (Journal Publication, Optimization Letters)

Voice AI Effectiveness for Debt Collection

PROF. ANUJ KAPOOR

Assistant Professor of Marketing

Status: Under Review

Link

Summary: Conversational AI Chatbots are rapidly evolving as new technologies with both business potential and customer reactance. This study exploits large-scale field experiment data on thousands of customers who are randomized to receive highly structured outbound sales calls from chatbots. We vary features like the gender of the bot along with the formal or informal tone of the bot. In this paper, we propose a dynamic outbound call experimentation policy. The proposed approach extends multi-armed bandit (MAB) algorithms, from statistical machine learning, to include microeconomic choice theory. Our automated outbound call policy solves this MAB problem using a scalable distribution-free algorithm. Beyond the actual experiment, we plan to counterfactual simulations to evaluate a range of alternative model specifications and allocation rules in MAB policies.

Research Output:
The paper has been quoted in the Economist, Ahmedabad Mirror, and Peninsula360Press. The paper has been presented at prestigious academic conferences and Institutions (by me or co-authors) at 1. Stanford University (2022) 2. Marketing Science Conference (2022) 3. AI ML Conference Temple University (2022) 4. University of South Florida (2023) 5. University of Missouri (2023) 6. Yale University, School of Management (2023) 7. Purdue University, Krannert School of Management (2023) 8. UC-San Diego, Rady School of Business (2023) 9. University of Chile (2023) 10. Zalando Data Science Group (2023) 11. China India Insights Conference, Yale & Stanford (2023)

Can an AI Coach Help You Lose More Weight Than a Human Coach: Empirical Evidence From a Mobile Fitness Tracking App

PROF. ANUJ KAPOOR
Assistant Professor of Marketing

Status: Under Review
Link

Summary: Artificial intelligence(AI) assisted tools are increasingly being used in health care contexts to provide advice and motivation. But whether AI can be a good or even better substitute for human involvement in these contexts is an open question. We provide empirical evidence to answer this question specifically in the context of fitness tracking mobile applications (apps). In addition to facilitating the tracking of activity and food intake, such apps provide advice and motivation in the form of targeted messages to their consumers, and this can be done through human coaches or an AI coach. An AI coach allows these apps to scale their offerings to a larger number of consumers, available on demand to consumers, and potentially more finely targeted by leveraging vast amounts of data. On the other hand, human coaches might be better placed to show empathy, and consumers might also feel more accountable to humans. We compare human and AI coaches on their effectiveness in helping consumers achieve their weight-loss goals. Our empirical analysis is in the context of a large-scale mobile app that offers consumers different levels of subscription plans with human and AI coaches respectively, and specifically compares adopters of the two kinds of plans on their weight loss and goal achievement. We address the potential self-selection in plans by employing a matching-based approach. We find, for our sample of almost 65000 consumers that human-based plans do better than those in AI-based plans in helping them achieve their goals, but that this differs by consumer characteristics including age, gender and body mass index (BMI).

Research Output:
The paper has been presented at prestigious academic conferences and Institutions (by me or co-authors) at 1. MIT CODE Conference (2023) 2. China India Insights Conference, Yale & Stanford (2023) 3. Yale centre for Customer Insights's 2024 InsightsOn Conference (2024)

Purchase/Biding behaviour of new and used anthropomorphized and non-anthropomorphized toaster products on eBay and classifying the toasters using ML techniques

PROF. HYOKJIN KWAK
The IIMA Chair Professor
Professor of Marketing

Status: Under Review

Summary: Major empirical methods: web scrapping, data pre-processing, independent t-test, machine learning classification method (CNN and ResNet-32).

This project aims to study how anthropomorphized 'brand new' and 'used' toaster products affect consumer purchase or bidding behaviour. To do this, I scrapped all the toaster data information like product name, number of consumers watching the product, bidding details etc., from eBay website, toaster products were then manually labelled as Anthropomorphized "AB" or Non- Anthropomorphized "Non-AB." Exploratory data analysis (EDA) was used to look at the attributes of the data. IBM SPSS software is also used to analyse the Independent sample t-test. This test compares the means of two independent groups, AB and Non-AB, to see if there is statistical evidence that the relevant attribute means are significantly different.

Also, multiple deep learning approaches were used to classify the AB and NAB toaster images.

Research Output:
Developed an ML algorithm to classify products into either anthropomorphic or nonanthropomorphic.

Effective Amul Brand Positioning Through Topical Ads and Brand Mascot: A Sentimental Analysis on Twitter Data

PROF. HYOKJIN KWAK
The IIMA Chair Professor
Professor of Marketing

Status: In Progress

Summary: Major empirical methods: web scrapping, data analysis, sentimental analysis.

The objective of this study is to check the purchasing behaviour of consumers in response to creative advertisements that have been posted on Amul's twitter handles and to also apply sentimental classification techniques to the comments that have been posted on Amul's twitter handles. Initially, I compiled all available data on Amul's most successful advertisements from 2019 to 2021, which can be

found on the company's website and neatly labeled according to year. Information about advertisements was then culled from the Amul Twitter account and matched with captions taken directly from the company's website. The properties of the data were investigated using exploratory data analysis (EDA) methods. IBM SPSS is also used to analyse the results of the independent sample t-test, which compares the means of two groups to determine whether or not there is statistical evidence of the relevant attributes are significantly different. In addition to that, a sentimental analysis was carried out on the user comments left on the advertisement that was uploaded to Amul's Twitter handle (https://twitter.com/Amul_Coop)

Sentimental Analysis on Amazon Book Reviews in India vs US

PROF. HYOKJIN KWAK

The IIMA Chair Professor
Professor of Marketing

Status: In Progress

Summary: Major empirical methods: web scrapping, data pre-processing, sentimental and emotions analysis.

This research will compare the emotional and sentimental analysis of book reviews that were posted on Amazon.in (India) and Amazon.com (US) by taking into consideration of other characteristics such as book ratings, book cost, discounts available on the book, etc. This study will focus mostly on the sentiments and emotions expressed in Amazon USA and India book reviews. I explored various algorithms like VADER (Valence Aware Dictionary and Sentiment Reasoner), Textblob, SentiBERT etc. to detect the sentiments present in the product reviews also explored emotions like happy, fear, disgust, anticipation, joy, sadness, surprise, and trust.

Production Recommendation using Product Reviews from Amazon India vs US

PROF. HYOKJIN KWAK

The IIMA Chair Professor
Professor of Marketing

Status: In Progress

Summary: Major empirical methods: web scrapping, data pre-processing, text analysis which includes identifying bi-gram and trigram words.

In this study, I will be performing an analysis of the textual contents, beginning with the reviews of the product and continuing all the way through to the purchase recommendation. In addition, a semi-automatic method will be utilised to extract terms from the text in reviews, and a knowledge graph will be utilised. The extracted phrases were connected to the various technical aspects of the items. After that, vector representations of the graph elements will be trained, which will result in a significant improvement in the overall quality of the recommendations. I intend to look into Adaptive Text Rank, which is based on a set of technical characteristics and a collection of sentiment words; the SOTA BERT model, which matches terms with the technical features of the products; the TransE method, which trains vector representations of graph elements; and the ABAE method, which highlights important characteristics for products based on a collection of reviews.

Building Fake Review Detection Model for Amazon India vs US

PROF. HYOKJIN KWAK

The IIMA Chair Professor
Professor of Marketing

Status: In Progress

Summary: Major empirical methods: web scrapping, data pre-processing, text analysis which includes identifying bi-gram and trigram words, collection of large labelled dataset of fake and non- fake reviews from official sources.

The most recent AI text generation models, such as GPT-2 and GPT-3, along with a variety of transformer models, can be utilised to generate fake computer-generated reviews. Researchers in the field of data science have demonstrated how artificial intelligence reviews may be generated and identified with the use of machine learning. Additionally, fake reviews can be purchased in bulk from various sources. Researchers have uncovered a wide range of potential traits that can help humans and models determine the difference between a fake review and a genuine one. These features were discovered after studying fake reviews in great detail. Because fake reviews frequently utilise the same language, the review content itself is generally considered to be the most important aspect. This is especially true in cases where multiple reviews were written by the same individual, firm, or other sources. Review length, Sentiment, Helpfulness, Reviews per user, and Verified review are some of the often-used features that can be noticed in studies on fake review detection. In order to create a model that is able to differentiate between the fake reviews that are posted on Amazon.com and Amazon.in, I will be conducting research into text-classification algorithms and NLP pre-processing techniques, such as count vectorization and TF-IDF, as well as machine and deep learning techniques

Topic Modelling on Online Product Reviews from Amazon India vs USA

PROF. HYOKJIN KWAK

The IIMA Chair Professor
Professor of Marketing

Status: In Progress

Summary: Major empirical methods: web scrapping, data pre-processing, text analysis, Latent Dirichlet Allocation (LDA).

The technique of automatically identifying topics that are present in a text item and deriving hidden patterns that are represented by a text corpus is referred to as topic modelling. The usage of topic models is beneficial for a variety of tasks, including the clustering of texts, the organisation of huge blocks of textual data, the recovery of information from unstructured text, and the selection of features.

My goal here is to extract a set number of relevant word groups from the reviews based on sentiment, i.e., positive, negative, or neutral. These word groups are essentially the issues that will aid in determining what the customers are actually talking about in the reviews. This will inform us which subjects are frequently addressed by Indian and American reviews when they favour or dislike the product. This can be expanded upon in terms of emotions as well.

Data-driven auction design: A computational approach

PROF. JEEVANT RAMPAL

Associate Professor of Economics

Status: In Progress

Summary: Auctions are often used to sell property rights for liquor licenses, spectrum licenses, land and mineral rights, and construction projects etc. This project investigates potential improvements in these auctions using a computational data-driven approach. The first part of this project will be to collect primary data of the participants and their choices in auctions. Subsequently, using the game-theoretic properties of the chosen auction design, we will computationally estimate the true (unobservable) value distribution across players of the object(s) being auctioned (e.g., liquor licenses). The estimation method used will be non-parametric "distance minimization" between the observed out-of-sample distribution of bids, and the predicted out-of-sample distribution of bids using optimally calibrated parameter values. E.g., Athey, Levin, and Seira (QJE 2011) use their estimated model to make comparative static predictions and test that for fit against data from timber auctions.

Finally, to analyse which auction design would have best met the various aims of the auction designer, we will use the calibrated model, parameters, and the estimated valuations of the bidders. In particular, using these we will simulate the revenue, efficiency, and other metrics of importance for different auction designs. In addition to the use of simulation described above, to analyse alternate auction designs, we will use simulations of variations of the estimated model, parameters (like risk aversion, budgets etc.), and value distributions to analyse the different rates with which different auction designs can meet the various possible aims of the auction designer.

Causes, Symptoms and Consequences of Sociocultural polarization

PROF. SAMRAT GUPTA

Associate Professor of
Information Systems

Status: Published

Link to the outcome - 1
Link to the outcome -2

Summary: The Information and Communication Technology (ICT) provides users unparalleled access to information from around the globe. In spite of demographic differences, people can communicate, express and evolve their opinions on topics ranging from politics to culture. The wide-ranging information exchange on digital media can lead to two scenarios viz. formation of public sphere or formation of echo chambers. While the public sphere, which promotes greater diversity, is a well-researched domain, substantially less research has been conducted on echo chambers in relation to socio-cultural events. Despite the huge affirmative impact of socio-cultural events on society, the proliferation of controversies around them and reinforcement through echo chambers is collectively having malefic effects on societies. Recent controversies around socio-cultural products such as movies, painting, books, cartoons, etc. resulted in serious outcomes. For example, Indian movie Padmavat brought polarization of public perception which further reinforced through echo chambers and escalated into widespread agitations. It led to mass destruction of property and human suffering during agitation. We believe this represents a mounting problem for society, one that is likely to intensify in the era of social media. Thus, understanding the causes, symptoms and consequences of socio-cultural polarization is critical and would be valuable for developing interventions to reduce unhealthy societal and organizational polarisations.

Research Output:

1. Gupta, S., Jain, G., & Tiwari, A. A. (2023). Polarised social media discourse during COVID-19 pandemic: evidence from YouTube. Behaviour & Information Technology, 42(2), 227-248.
2. Kaur, K., & Gupta, S. (2023). Towards dissemination, detection and combating misinformation on social media: a literature review. Journal of business & industrial marketing, 38(8), 1656-1674.
3. Gupta, S., Deodhar, S.J., Tiwari A.A., Gupta, M., Mariano, M. (2024). How consumers evaluate movies on online platforms? Investigating the role of consumer engagement and external engagement. Journal of Business Research (Forthcoming)

Models of implied volatility and information content of option prices

PROF. SOBHESH KUMAR AGARWALLA

Professor of Finance and
Accounting

PROF. VINEET VIRMANI

Associate Professor of
Finance and Accounting

Status: In Progress

Summary: The proposed research project on modeling implied volatility (IV) and understanding the information content of option prices is part of our larger research agenda on studying ways to quantify uncertainty in financial markets, focusing on India.

Traders in options markets do not usually quote option prices, but the volatility implied by them. IV is that volatility input to the famous Black-Scholes option pricing formula such that the Black-Scholes prices match the market price of the options. It has been observed that IV is not a constant but varies systematically with strike/delta and expiration date. The shape of the observed relationship between implied volatility and strike is called volatility smile or skew. In this project, we plan to explore various ways of modeling the dynamics of volatility smile using variants of state-space models and the Kalman Filter.

'Scandalous' and 'Obscene' Trademark Law: Determining the scope of morality-based proscriptions in Indian Law

PROF. M P RAM MOHAN
Professor of Strategy

Working paper
Link to the outcome

Summary: Morality-based restrictions on trademarks are prevalent in trademark legislations worldwide, existing in 163 out of 164 WTO member states. In 2019, the United States Supreme Court held that such restrictions fall afoul of their free speech jurisprudence. Yet, in the process, the Court explicitly emphasized the significance of linguistic regulation rooted in moral principles within trademark law. Despite having housed these provisions for over four decades, no legislative or judicial body has interpreted morality-based proscriptions in Indian law. The administrative practices of the Indian Trade Marks Registrar and a review of the Indian Trade Marks Register demonstrate extreme inconsistency and incoherence in applying the ban against 'scandalous' and 'obscene' content in Indian trade mark law. These findings highlight the urgent need for comprehensive guidelines that combine legislative heritage and insights from Australian law to establish a consistent framework for identifying the import and meaning of 'scandal' and 'obscenity' in Indian law.

Supporting Parents to Impact Foundational Literacy and Numeracy (FLN) of Children

PROF. AMBRISH DONGRE
Assistant Professor of Ravi J. Matthai Centre For Educational Innovation

Status: In Progress

Summary: India has made rapid strides when it comes to access to primary schooling and enrolment. Data from a variety of sources suggests that the percentage of children in the age-group of 6 to 10 years enrolled in school is near universal, and the drop-out rates low. But at the same time, concerns about learning outcomes persist. It is well accepted that a large fraction of enrolled children and are below the level expected at the grade in which they are enrolled and lack Foundational Literacy and Numeracy (FLN) skills.

Saajha, an NGO based in Delhi, is attempting to tackle this challenge by focusing on the parents of children attending government primary schools, an approach which is receiving increased attention recently. Saajha onboards parents on their WhatsApp platform, conducts the asssessment of their children over telphone and based on their learning level shares appropriate leaning content with parents through their WhatsApp chatbot. We are collaborating with Saajha to design and implement multiple experiments to improve their operational efficiency and reduce their cost of engaging with parents. One of the biggest challenges that Saajha faces is that the majority of parents leave the platform before their child achieves FLN. Till now we have designed and implemented five experiments that can improve parental engagement and reduce the cost of supporting them. Some of these experiments show promising results.

i) We designed a field experiment to check whether a WhatsApp message that explicitly sought a parent's commitment to undergo the assesment of their child could reduce the cost of conducting an assessment. We found that parents who commited to conducting their child's asssessment using the WhatsApp feature did so in fewer calls leading to substantial cost saving for Saajha.

ii) Calling agents call around 40-50 parents daily and complete approximately 10-12 telephonic assessments per day. Calling agents are paid a fixed monthly salary and forms a substantial portion of the variable cost incurred by Saajha to support one parent. One proposed solution to bring down the cost is to engage volunteers to conduct these assessments. Unlike full-time agents who receive fixed salaries, volunteers are compensated per resolved assessment. An experiment was designed to test this trade off. Results indicate that retention rate of parents is same irrespective of whether their assessment is done by an agent or a volunteers. However, volunteers are not marking the learning level of the child accurately.

We also conducted a qualitative survey of parents enrolled on the Saajha platform to understand the use of smartphones in the context of primary education in India. The main results of the qualitiatve survey are shared in the CDSA communique September 2023.

Publications by Post Doctorals at Centre

NEAKETA CHAWLA

Post - doctoral Research Associate (January 2022 - Present)

- Sengupta, N., Chawla, N., Agarwal, A., & Evans, J. (2023). Do online certifications improve job market outcomes? Evidence from an IT skills certification platform in India. Information Economics and Policy, 65, 101067 . https://www.sciencedirect.com/science/article/pii/S0167624523000525

- Chawla, N., Mondal, D. (2024). Seller competition on two-sided platforms. Journal of Economics. https://link.springer.com/content/pdf/10.1007/s00712-024-00862-1.pdf

- Chawla, N., & Mondal, D. (2022). Platform competition and price discrimination. Indian Economic Review, 57(1), 1-21. https://link.springer.com/content/pdf/10.1007/s41775-022-00138-9.pdf

KULVINDER KAUR

Post - doctoral Research Associate (January 2022-23)

- Kaur, K. and Gupta, S. (2022), Towards dissemination, detection and combating misinformation on social media: A literature review, Journal of Business & Industrial Marketing. https://doi.org/10.1108/JBIM-02-2022-0066

- Kalia, P., Zia, A. and Kaur, K. (2022), Social Influence in Online Retail: A Review and Research Agenda, European Management Journal. https://doi.org/10.1016/j.emj.2022.09.012

- Singh, N., Kaur, K. and Deol, R.S. (2022), Transition of E-Service Quality Dimensions from Diverse Business Settings to E-Learning: A Review from Learners' Perspective, Indian Journal of Marketing, Vol. 52 No. 7, pp. 8-24. https://doi.org/10.17010/ijom/2022/v52/i7/170536

- Agrawal, M., Kalia, P., Nema, P., Zia. A., Kaur, K. and John. H. B. (2023), Evaluating the influence of government initiatives and social platforms on green practices of Gen Z: The mediating role of environmental awareness and consciousness , Cleaner and Responsible Consumption. https://doi.org/10.1016/j.clrc.2023.100109.

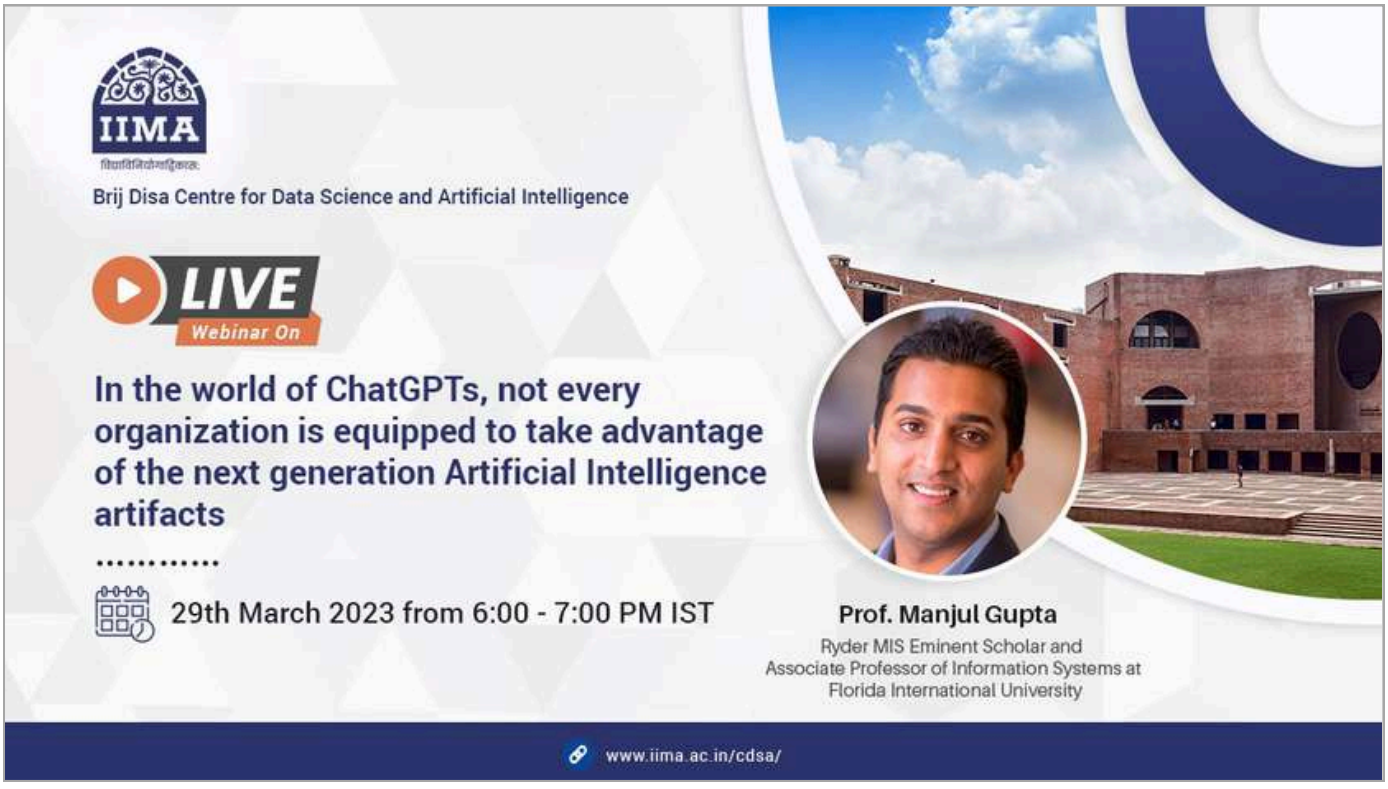
Seminars and Webinars

Title: In the world of ChatGPTs, not every organization is equipped to take advantage of the next generation Artificial Intelligence artifacts

Bio: Dr. Manjul Gupta is Ryder MIS Eminent Scholar and associate professor of information systems at Florida International University. He holds a PhD. in management information systems from Iowa State University. His research is focused on the role of national culture and organizational culture in a variety of technology-driven phenomena, such as bitcoin/blockchain adoption, artificial intelligence, big data, and social networks. His research has appeared in several leading journals including Management Information Systems Quarterly (MISQ) Production and Operations Management (POM) journal, Health Affairs, and Information & Management. Dr. Gupta consults organizations on how to assess national cultural nuances for launching products/services in international markets and helps organizations in evaluating their existing cultures and implementing changes according to their vision.

Abstract: The era of ChatGPTs has begun such that organizations in all industries would eventually be investing in these artificial intelligence (AI) artifacts. However, we know from prior literature that investments alone do not generate competitive advantage; instead, firms need to create capabilities that rival firms find hard to match. When all organizations of similar sizes have access to tools like ChatGPT, simply owning a technological artifact will not be sufficient to generate a competitive advantage. The firm would need to develop a unique combination of a variety of firm-specific resources that would result in the creation of an AI-oriented capability that would outperform the capabilities of the rival firms.

Link to the webinar



Title: A Theory-Based Explainable Deep Learning Architecture for Music Emotion

Bio: Hortense Fong is an Assistant Professor in Quantitative Marketing at Columbia Business School. She uses machine learning, econometric, and experimental methods to study how emotions impact consumer behavior, taking advantage of the rich unstructured data (text, images, video, music) that are increasingly available. A distinguishing feature of her machine learning interests involves going beyond its use in prediction to study how to incorporate domain-specific theoretic and managerial knowledge into machine learning systems and make machine learning systems more interpretable. She also has a broader interest in questions at the interface of marketing and society (e.g., fairness) especially when it relates to the widespread adoption of artificial intelligence in various business and marketing settings.

Link to the webinar

Abstract: This paper introduces MusicEmoCNN, a theory-based deep learning convolutional neural network (CNN) classifier designed to predict time-varying emotional responses to music. Utilizing mel spectrograms and novel CNN filters based on sound wave physics, our model connects predicted emotional responses (valence and arousal) to human-interpretable music features. Outperforming traditional models and rivaling state-of-the-art CNNs, MusicEmoCNN offers enhanced interpretability. Additionally, we demonstrate its application in digital advertising, showing that ads placed in emotionally congruent contexts within content videos yield higher brand recall rates. Leveraging our model's predictions, we identify emotionally similar contexts for ad placement.

Title: Environmental and Social Convergence Through Cross-border Acquisitions: Evidence from emerging Market Multinationals

Bio: Kaustav Sen is a Professor of Accounting at Lubin School of Business, Pace University, New York. He has published in the areas of corporate governance, financial reporting and stock price anomalies. Current interests include examining sustainability issues around corporate finance decisions and the role of text analysis for financial forecasting. He serves on the Editorial Board of Journal of International Accounting, Auditing & Taxation and has been a consultant at Prudential, New York Life and GE Capital in equity investments and risk management. He has held visiting faculty positions at Indian Institute of Management Calcutta and Hong Kong Polytechnic University.

Abstract: Emerging market multinational firms (EMNEs) have increased their access into developed markets over the recent years through cross-border acquisitions. Since there is an increasing emphasis on stakeholder approach and sustainability in current business practices, we examine the changes in environmental, social and governance (ESG) measures of EMNEs after accessing developed markets. Our preliminary results suggest that EMNE acquirers substantially improve on environmental and social performance in two years after acquiring developed market targets. Furthermore, explore the sensitivity of the post-event performance to various sustainability aspects as well as target market characteristics and find that environmental but not social changes have value implications.

Title: Multi-Objective Personalization of the Length and Skippability of Video Advertisements.

Bio: Anuj Kapoor is an Assistant Professor of Quantitative Marketing at IIM Ahmedabad. His research interests are in the economics of digitization, artificial intelligence, privacy, and digital platforms. His research focuses on understanding how big data and artificial intelligence shape consumer welfare and digital markets. He uses a quasi- and actual experimental variation to explore how different types of human behavior in varying contexts affect algorithms. He works closely with firms to suggest to them more ways to become data-driven. He has ongoing collaborations with various tech start-ups in India in the digital media and health tech space. Anuj received his Ph.D. in Business Administration (Quantitative Marketing and Economics) from the David Eccles School of Business at the University of Utah. After his doctoral studies, he worked in the data science space in San Diego, USA. At IIMA, he teaches electives on Artificial Intelligence and Marketing and Privacy Paradox: Data, Artificial Intelligence, and Digital Platforms

Link to the webinar

Abstract: Abstract: This paper examines the impact of digital video ad length and scriptability on content-streaming platforms. Through a field experiment with vdo.ai, users are randomly assigned to Skippable/Long and Non-Skippable/Short ad versions. Results reveal that while the Skippable/Long ad increases ad consumption, it decreases video consumption, posing a challenge for platforms aiming to maximize both outcomes. To address this, we propose algorithms for multi-objective personalization, leveraging individual substitution patterns to optimize ad and video consumption. Our findings demonstrate significant improvements over single-objective policies, with multi-objective policies enhancing ad consumption by 61% with only a 4% decrease in video consumption and increasing video consumption by 47% while reducing ad consumption by just 13%. We discuss practical implications for real-time platform decision-making.

Title: The Changing Regulation of AI: A view from the UK

Bio: Professor Paul Nightingale, an esteemed academic, boasts a career that spans various facets of the field of strategy. He serves as a Professor of Strategy within the Science Policy Research Unit (SPRU) and in the domain of Business and Management. In addition to these prestigious positions, he serves as Associate Dean of Research at the University of Sussex Business School.

Professor Paul Nightingale, an esteemed academic and scholar, has cultivated a diverse career marked by a deep commitment to understanding innovation, strategy, and the complex relationships among technology, finance, and public policy. Grounded in a background in chemistry, he holds a Master of Science (MSc) in Innovation Management and a Doctor of Philosophy (DPhil) from the University of Sussex. After completing his PhD, Professor Paul spent a decade at the Complex Product Systems Innovation Centre, jointly run between SPRU and CENTRIM. During this tenure, he made significant contributions, focusing on bioinformatics systems and risk management technology within investment banks. His work consistently sheds light on the intricacies of technical change and the evolving role of innovation in the ever-changing economic landscape. Professor Paul Nightingale remains a prominent figure in academia, renowned for his influential work in these vital areas.

Title: Generative AI and Personalized Video Ads.

Bio: Prof. Anuj Kapoor is an Assistant Professor of Quantitative Marketing at IIM Ahmedabad. His research interests are in the economics of digitization, artificial intelligence, privacy, and digital platforms. His research focuses on understanding how big data and artificial intelligence shape consumer welfare and digital markets. He uses a quasi- and actual experimental variation to explore how different types of human behavior in varying contexts affect algorithms. He works closely with firms to suggest to them more ways to become data-driven. He has ongoing collaborations with various tech start-ups in India in the digital media and health tech space. Anuj received his Ph.D. in Business Administration (Quantitative Marketing and Economics) from the David Eccles School of Business at the University of Utah. After his doctoral studies, he worked in the data science space in San Diego, USA. At IIMA, he teaches electives on Artificial Intelligence and Marketing and Privacy Paradox: Data, Artificial Intelligence, and Digital Platforms.

Abstract: We study the effectiveness of personalized video advertisements created using Generative AI (GenAI). We run a mobile ad targeting field experiment on WhatsApp in partnership with a leading B2C e-commerce brand that sells eco-friendly sustainable products. We randomize users into receiving ads from one of three targeting conditions – 1) Generative AI-enabled personalized video ads, 2) personalizedimage ads, and 3) generic non-personalized video ads. The first group is our main treatment and the latter two serve as baselines. Our results show that Generative AI-enabled personalized video ads increase engagement by 6-9 percentage points over the baselines. We explore response heterogeneity across important user segments and find that GenAI-enabled ads increase engagement among potential "high-value" users and historically "non-engaged" users.

Link to the webinar

Title: Payments Data and Machine Learning: Opportunities and Challenges

Bio: Ajit Desai is currently working as a principal data scientist in the research division of the Bank of Canada (Canada's reserve bank). His work leverages cutting-edge techniques such as artificial intelligence (AI), machine learning (ML), and quantum computing (QC) to study payments data, including cryptocurrency data, with the primary objective of making digital payments infrastructure safe and efficient. Dr. Desai received his Ph.D. from Carleton University in 2018 in Computational Science and Engineering and his M.S. from the Indian Institute of Technology Madras in 2011.

Abstract: The world is changing, and so is the way it is measured; we are now living in the age of AI and Big Data. This is particularly evident in the payments ecosystem due to rapid digitization accelerated by the COVID-19 pandemic. This shift is generating an abundance of high-frequency payments data, complemented by the continuous advancements in artificial intelligence, machine learning, and quantum computing. This synergy of payments data and advanced analytics holds promise for addressing various challenges, such as real-time economic monitoring, systemic risk assessment, and efficiency improvements in payments systems. This seminar will provide a comprehensive overview of research in this area, showcasing practical use cases across supervised, unsupervised, and reinforcement learning, along with the evolving field of quantum computing.

Link to the webinar

Title: Anomaly detection for time-series data: Online data-driven changepoint detection for high-dimensional dynamical systems

Bio: Prof. Romit Maulik is an assistant professor in the Information Science and Technology Department at Pennsylvania State University and a faculty affiliate at the Mathematics and Computer Science Division at Argonne National Laboratory. He was the Margaret Butler Postdoctoral Fellow at Argonne National Laboratory. He holds a doctoral degree in mechanical and aerospace engineering from Oklahoma State University. Dr. Maulik leads the research team at the Interdisciplinary Scientific Computing Laboratory (ISCL), where he focuses on leveraging the concepts of applied mathematics, physics, and computer and data science to design computational strategies for multidisciplinary engineering applications.

Abstract: Prof. Romit Maulik presents anomaly detection algorithms for detecting intermittent events in dynamical systems proposed in his recently published research article - "Online data-driven changepoint detection for high-dimensional dynamical systems". In this work, data-driven anomaly detection algorithms are devised for high-dimensional dynamical systems that exhibit intermittent events. The proposed algorithm addresses (a) high-dimensionality through deep learning compression via autoencoders and, (b) online detection of changepoints via a conjugate Bayesian formulation. The proposed algorithms are tested on prototypical dynamical systems given by the (a) Lorenz-63 system, (b) the Rossler system, and (c) a high-dimensional forced Kolmogorov flow. Further analysis shows that the proposed method is able to detect transitions that are associated with visiting new regions of phase space during the evolution of the dynamics.

Link to the webinar

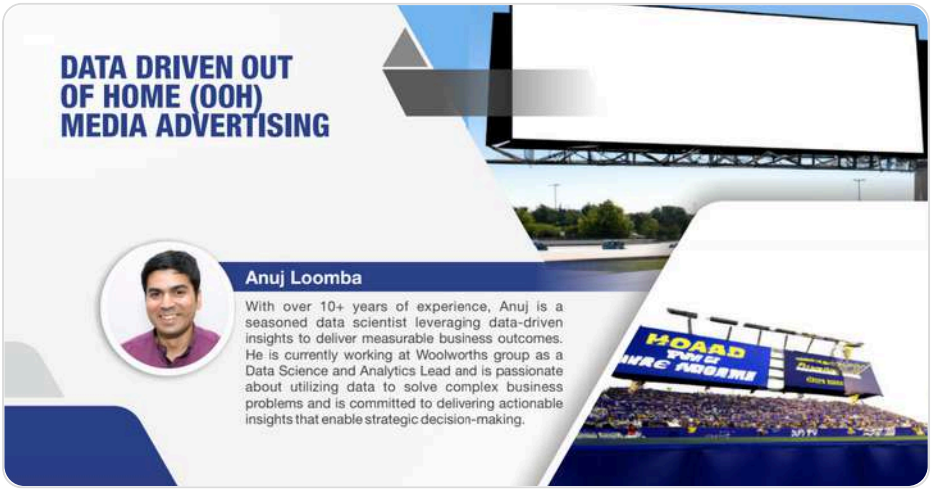
Title: Responsible News Dissemination and Echo Chambers: Impact of Personality Type and Idealogy on Echo-Chamber Driven Misinformation

Bio: Ashish Kumar Jha, Associate Professor at Trinity College Dublin, founding director of M.Sc. in Business Analytics and Director of Trinity Centre for Digital Business and Analytics. Research focus: social media's impact on firm value and spread of information/misinformation. Honorary M.A. from Trinity College Dublin. Visiting lecturer in USA, Canada, China, UAE, India. Member of Association of Information Systems. Associate editor at European Journal of Information Systems and Information & Management. Senior editor at Journal of Organizational computing and E-Commerce. Consults for Microsoft Ireland, Novartis, EY Ireland, BNY Mellon. Holds patents in Robotic Process Automation. Well funded by Science Foundation Ireland, funded investigator for SFI-Funded research centre ADAPT.

Abstract: Digital social media platforms are pivotal in disseminating and shaping online discourse. Misinformation proliferation poses a significant threat due to heightened information consumption. Echo chambers, limiting environments where like-minded content reverberates, exacerbate this issue. Our study explores how user-level factors like political ideology and personality intersect with platform dynamics to influence information perception. We investigate how platforms disseminating responsible news can counter echo chambers and curb misinformation. Through a US political context experiment with 464 respondents across two phases, we find that challenging opinions have a greater impact on mitigating fake news dissemination among right-wing individuals. This underscores the need for platforms to foster diverse and responsible digital environments. Theoretical contributions include examining social media users' information consumption from a psychological standpoint and empirically testing existing arguments.

Communique Articles

May 2023



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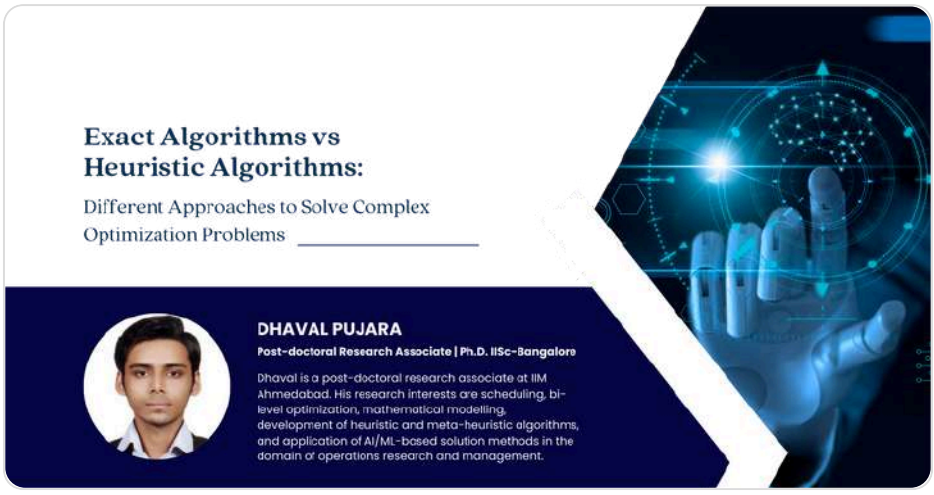
September 2023



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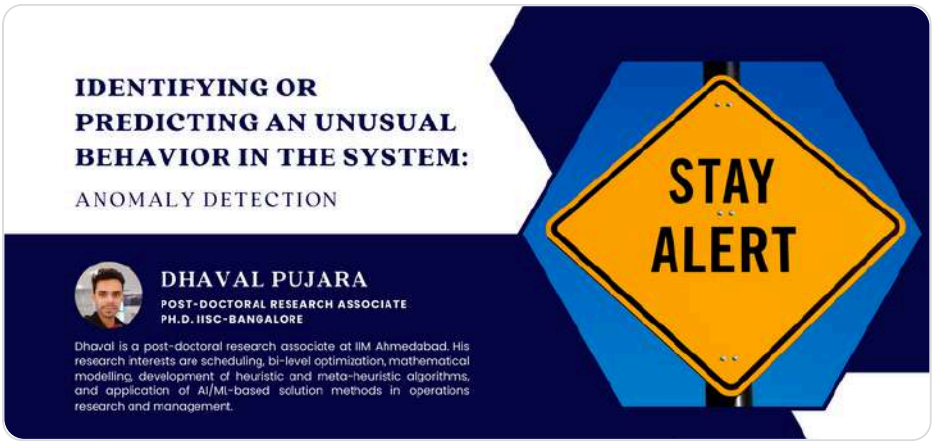
March 2024



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