4th International Conference on Data Management, Analytics and Innovation

The United Services Institution of India (USI), New Delhi, India

17 – 19 January 2020

REPORT

Report Prepared By:
Dr. Neha Sharma
Steering Committee Chair, ICDMAI 2020
Technical Programme Chair, ICDMAI 2020
Founder Secretary, Society for Data Science

4th International Conference on Data Management, Analytics and Innovation

The United Services Institution of India (USI), New Delhi, India

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INDEX

ACKNOWLEDGEMENT

International Conference of Data Management, Analytics and Innovation (ICDMAI) is a signature conference of Society for Data Science (S4DS). We are committed to create a forum which brings academicians, researchers, corporate experts and students on same page. Planning towards ICDMAI 2020 started around 14 months back and the entire core team ensured that we surpass our own bench mark. The core committee had taken utmost care in each and every facet of the conference, especially regarding the quality of the submissions. Out of 514 papers submitted to ICDMAI 2020 only 12% (62 papers) were selected for oral presentation after rigorous review process. This year the conference witnessed participants from 08 countries, 25 Industries, 80 International and Indian Universities (IITs, NITs, IISER etc).

We appreciate the bonhomie and support extended by IBM since last 03 years, Wizertech since last 02 years, Springer since last 03 years, Ericsson, NIELIT-Kolkata, IISER-Kolkata and REDX-Kolkata. The conference of this magnitude was possible due to the consistent and concerted efforts of many good souls. We acknowledge the contribution of our advisory body members, technical programme committee, people from industry and academia, reviewers, session chairs, media and authors, who have been instrumental in making this conference possible.

Dr. Neha Sharma
Steering Committee Chair, ICDMAI 2020
Technical Programme Chair, ICDMAI 2020
Founder Secretary, Society for Data Science

Conference Organizing Committee with Operational Team of ICDMAI 2020

1. EVENT DETAILS

Event Type	:	Research Consortium
Description	:	International Conference
Event Name	:	4th International Conference on Data Management, Analytics and Innovation (ICDMAI 2020)
Venue	:	The United Service Institution of India, New Delhi
Date	:	17-19 January 2020

2. CONCEPTION OF THE PROGRAMME

As per the survey, in the list of top 10 leading companies in 2006, there were 05 energy companies and only 01 IT company ie. Microsoft. But just 10 years later, in 2016, with just a blink of an eye, the situation reversed and in the list of top 10 companies, there were only one energy company and 05 it companies. What happened in just a decades time? We all are aware that the data is available in abundance, and they say it's a new fuel.Now big data threatens the old order and those old icons. It is fast replacing finance as the driver of business . However, a true wealth lies in innovations done using data. All the leading companies like apple, google, amazon, facebook, tesla, they all have research centers and research is going on in continuous basis. They have a reason to do so because this is an era of confluence of big data, connectivity and artificial intelligence. This has revolutionized the old industries and created an entirely new industry. Therefore, to prepare ourselves for this global competition, **Fourth International Conference of Data Management, Analytics and Innovation (ICDMAI 2020)** on **17-19 January 2020** was conceptualized. Cloud computing play very important role in data science and analytics.The conference aims to focus on Data Management, Analytics and Innovations associated with it, which we believe would play a pivotal role in making of new digital India, involving researchers from Industry and Academia. The conference would strive to give a thrust to research and make global impact using technology, as well as enable innovations to create positive impact on humanity and economy. Conference is designed to provide great opportunities to learn from and offer quality research work and innovations to academicians, scientists, research scholars, industry experts and students in the field of data management and analytics. This programme is to bring together researchers, engineers and practitioners interested on databases, big data, data mining, data management, data security and other aspects of information systems and technology involving advanced applications of data.

3. OBJECTIVES OF ICDMAI-2020

The three-day International Conference ICDMAI 2020 is designed to provide a common platform to the scientists, professors, research scholars, industry experts and students from all over the globe to share and disseminate knowledge on their original research.The recent developments at global level shows growth in cloud-based data warehousing, real-time technology and big-data platforms, influencing business to a large extent and intensifying the competition. Together, data and analytics are the single most powerful catalysts for change in the enterprise. The conference would be a gathering of experts to "confer" about their own and each other's work, to hear experts illustrate on their work and to exchange their views on various topics relevant to the conference theme. The notable objectives of ICDMAI 2020:

1. To create an ecosystem of data science community by connecting to like-minded individuals and bringing them together for discussion.
2. To create a platform for the researchers and developers to collaborate and to identify avenues of funding for their project.

3. To organize a keynote sessions by expert from diverse verticals to set the central theme of conference.
4. To arrange pre-conference tutorial sessions and workshops, a day before the main conference, to set the right context.
5. To organize plenary talks to provide additional research highlights.
6. To arrange demonstrations and workshops on the innovative projects and products by experts from government sector and industry.
7. To provide the platform to present the research work in the form of oral/poster presentation in the field of Data Management & Smart Informatics, Big Data Management, Artificial Intelligence & Data Analytic, Advances in Network Technologies.
8. To arrange discussions on novel ideas and innovations to provide insight on various aspects of evolving technological advances for digitizing India.
9. To discuss the challenges in adopting the technologies, with a view to make recommendations concerning the problems under discussion.

The conference ensured the tangible takeaways for each participant of ICDMAI 2020.

4. CALL FOR PAPERS

Fourth International Conference on Data Management, Analytics and Innovation (ICDMAI – 2020) solicited papers in the areas of Computer Science, Information Technology, Computational Engineering, Electronics and Telecommunication, Electrical, Computer Application and all the relevant disciplines, to be presented at a common forum. Original, unpublished research papers highlighting specific research domains from all viewpoints were invited from delegates all over the globe. The selected and presented paper would be included in the proceedings published by prestigious AISC series of **SPRINGER**. Following are the topics of interest but not limited to:

Track I – Data Management & Smart Informatics

Data Exchange, Integration, quality, cleaning and Lineage, Database administration and upgrading challenges, Algorithms and Programming Techniques, Real-time data management in navigation and mobility, Agricultural Informatics and Communication, Community Information Systems, Computational Economics, Digital Photogrammetry, Remote Sensing, GIS and GPS, Disaster Management, e-governance, e-Commerce, e-business, e-Learning, Forest Genomics and Irrigation Informatics, Healthcare Informatics and Neuroinformatics, Information Ecology and Knowledge Management, Open Source: Challenges and opportunities, Web-Based Learning: Innovation and Challenges

Track II – Big Data Management

Algorithm for Big Data, Big Data Fundamentals, Infrastructures for Big Data, Big Data Management and Frameworks, Big Data Search, Security and Search in the era of Big Data, Applications of Big Data, Big Data Analytics, Metrics, Platforms, Business Performance Management using Big Data Technique

Track III – Artificial Intelligence and Data Analytics

Artificial Intelligence and Machine Learning, Evolutionary Computation Techniques, Mobile Robotics, Speech Recognition & Synthesis, Facial Detection for Security and Tracking, Heuristic and Genetic Algorithms for Scheduling problems, Pattern Recognition, Image and Video processing, Bio Informatics, Assistive Technology, Augmented Cognition, Calm Technology, Ubiquitous and Pervasive Applications

Track IV – Advances in Network Technologies

Data Models and Applications of Social Networks and Social Media, Mobile Software Architectures, Systems, Platforms, Services, and Regulatory Issues, Mobile Network Traffic Engineering, Performance, and Optimization, Cloud Computing Architectures and Cloud Solution Design Patterns, Cloud Configuration,

Performance, and Capacity Management, Fogg Computing, Green Computing and ICT, 4G and Long Term Evolution (LTE), Computer Networks and Security

*(**Annexure A**-Conference Brochure)*

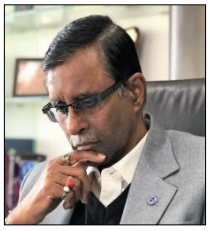
5. CONFERENCE MANAGEMENT COMMITTEE

Conference Management Committee is the key for successful organization of any international level conference and ICDMAI-2020 conference is not exception to it. The primary role of the committee was to provide independent advice that will contribute to the quality enhancement of the conference regulatory decision-making and lend credibility to the review process. They also recommended/suggested changes and amendments towards the successful execution of the conference. ICDMAI-2020 was fortunate enough to get some of the renowned professors and researchers of the world, on the board. The details are as follows:-

PATRON

Amol Goje
President,
Society for Data Science

GENERAL CHAIRS



Dr. P.K. Sinha
Vice Chancellor and Director, Dr S P Mukherjee International Institute of Information Technology, Raipur, Chhattisgarh

Dr. Vincenzo Piuri
Professor, Università degli Studi di Milano, Italy

STEERING COMMITTEE CHAIRS

Amlan Chakrabarti
Director and Professor, A.K.Choudhury School of Information Technology, University of Calcutta, India

Neha Sharma
Founder Secretary, Society for Data Science

EXECUTIVE COMMITTEE OF S4DS

Amol C. Goje is a President of Society of Data Science and has served as a Director, Vidya Pratishthan's Institute of Information Technology (VIIT), Baramati, Pune for last 19 Years. He has a total of over Twenty Five years of experience in the field of Information and Computer Technology (ICT). Dr. Amol's main area of interest is to work for underprivileged people in the rural part of India and his noteworthy innovation is Computer Mobile Van, which are economically sustainable to the rural schools and colleges. He has done lot of research work in Information Technology and its application for rural community. In appreciation to his exemplary work, Dr. Amol has received the Ashoka Fellow award in the year 2002. He is engaged as a Technical advisor on many government and non-government organizations. He was also a member of the Planning Commission, Government of India in Information Technology division. Dr. Goje has received the **Marathwada Bhushan Award** for spreading the IT education to the masses. He is the member of the Working group on Agricultural Extension Constituted by Planning Commission government of India. He is key player in setting up the Community Training and Learning Centers (CTLC) in Maharashtra, to provide Computer Training to the women from the Self Help groups (SHG). Dr. Goje has received the Manthan (AIF) award successively for two years in Year 2005 and 2006. Governemt of Maharashtra "Maharashtra IT award (IT HRD) in 2008. He is also the **President of Community Radio Association (CRA)** of India. Recently he has been bestowed with the honor of **'Best Director'** of Pune University -2016-17

Amlan Chakrabarti is presently the Dean Faculty of Engineering and Technology and Director of the A.K.Choudhury School of Information Technology, University of Calcutta. He is an M.Tech. from University of Calcutta and did his Doctoral research at the Indian Statistical Institute, Kolkata. He was a Post-Doctoral fellow at the School of Engineering, Princeton University, USA during 2011-2012. He is the recipient of DST BOYSCAST fellowship award in the area of Engineering Science in 2011, Indian National Science Academy Visiting Scientist Fellowship in 2014, JSPS Invitation Research Award from Japan in 2016, Erasmus Mundus Leaders Award from European Union in 2017. He is the Team Leader of the European Center for Research in Nuclear Science (CERN, Geneva) ALICE-India project for University of Calcutta and also a key member of the CBM-FAIR project at Darmstadt Germany. He is also the Principal Investigator of the Center of Excellence in Systems Biology and Biomedical Engineering, University of Calcutta funded by MHRD (TEQIP-II). He has published around 100 research papers in referred journals and conferences. He has been involved in research projects funded by DRDO, DST, DAE, DeITy, UGC, Ministry of Social Empowerment, TCS and TEQIP-II and has mobilized funding of around 8 crore INR. He is a Sr. Member of IEEE and ACM, Secretary of IEEE CEDA India Chapter and Dist. Speaker of ACM. His research interests are: Quantum Computing, VLSI design, Embedded System Design, Computer Vision and Analytics.

Neha Sharma is working with TCS and is a Founder Secretary of Society for Data Science, India. Prior to this she has worked as Director, Zeal Institute of Business Administration, Computer Application & Research, Pune, Maharashtra, India and as Dy. Director, Padmashree Dr. D.Y.Patil Institute of Master of Computer Applications, Akurdi, Pune. She is an alumnus of a premier College of Engineering affiliated to Orissa University of Agriculture and Technology, Bhubaneshwar. Neha Sharma has completed her PhD from prestigious Indian Institute of Technology (ISM), Dhanbad. She is a Senior IEEE member, Website and Newsletter Chair of IEEE Pune Section and served as Student Activity Committee Chair for IEEE Pune Section as well. She is an astute academician and has organized several national and international conferences and seminars. She has published several papers in reputed indexed journals, both national as well as international. She is a well-known figure among the IT circle of Pune, and well sought over for her sound knowledge and professional skills. Neha Sharma has been instrumental in integrating higher education with the current needs of the Industry. Not only loved by her students, who currently are employed in reputed firms; for her passion to mingle freely with every one, Neha Sharma enjoys the support of her colleagues as well. She is the recipient of "**Best PhD Thesis Award**" and "**Best Paper Presenter at International Conference Award**" at National Level by Computer Society of India. Her area of interest includes Data Mining, Database Design, Analysis and Design, Artificial intelligence, Big data, Cloud Computing, Block Chain and Data Science.

Col Inderjit Singh Barara is a well-known personality in technical world especially in the world of Information System. An experienced Info Systems professional and a TEDx Speaker with experience of more than 27+ year across wide spectrum of areas spanning Info Security, Risk Management, Cyber Security , Cyber Forensics, Cyber Warfare, Expertise in SOC and CERT, Cloud Computing, Big Data , Internet of Things (IoT) including IoT Security, Blockchain, Machine Learning and Artificial Intelligence. He has consistently delivered mission-critical results and seamlessly managed diverse functions related to Project Management, Service Delivery and Key Account Management. He exhibits and models, influential leadership skills through efficient management of large and dispersed teams while promoting a

cooperative working atmosphere. He delegates assignments according to skills and expects implementation of quality strategies. He demonstrates a strong work ethic and encourages teamwork, while clearly defining standards and expectations. He has a strong visioning and strategic thinking ability. He envisions opportunities and converts successfully into business through swift and analytical decision making, keen eye for innovations in Technology. His Core Competencies are Creating business value supported by technology, Aligning IT with business, thought leadership, IT Transformation, turn around IT organization and improve effectiveness, Managing teams with focus on outcomes, Strategic Outsourcing and cost management, Business Process Improvement & Organizational Efficiency and Effectiveness, leading to applied cross-industry learning towards problem solving, thought leadership for E-Commerce start up. He was awarded Magnificent CIO Award in year 2016 and has been awarded Excellence Award - Cyber Security, Cyber Terrorism and Cyber Warfare for year 2019 by International Police Commission.

Saptarsi Goswami is currently working as an Assistant Professor – Computer Science, Bangabasi Morning College affiliated to University of Calcutta. He has completed his Ph.D in the area of feature selection in the year 2018 from University of Calcutta. He has 16+ years of professional experience, out of which he has spent 10 + years in IT Services Industry in companies like Cognizant, PwC and Tata Infotech. He has briefly worked as a visiting scientist in Iwate Prefectural University, Japan. He has managed large data warehousing programs, as well as took active role in solutioning and designing. He has authored 50 + Journal, conference articles and book chapters. He is working as a meetup Ambassador of Open Data Science Conference (ODSC) for Kolkata Chapter. He conducts regular workshops and organizes meet-ups in the area of data science, machine learning and deep learning. He is working as a co-principal investigator in the domain of renewable energy in a funded project by United Sates Agency of International Development. He is a very active member of the data science community in Kolkata and regularly interacts with different organizations. He actively reviews articles in various journals and conferences.

ORGANIZING CHAIR

Col. Inderjit Singh Barara
Technology Evangelist, Solution Architect and a Mentor

SPONSORSHIP -GRANT CHAIR

Yumnam Jayanta Singh
Director,
National Institute of Electronics and Info Technology (NIELIT), Kolkata, (Ministry of Electronics and IT, Govt. of India)

INTERNATIONAL LIASON CHAIRS

Juergen Seitz
Head of Business Information Systems Department, Baden-Wuerttemberg Cooperative State University, Heidenheim, Germany

Goutam Chakraborty
Department of Software & Information Science Iwate Prefectural University, Iwate Ken, Takizawa, Japan

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Himadri Nath Saha
Institute of Engineering & Management, Kolkata

Jyoti Prakash Singh
National Institute of Technology, Patna

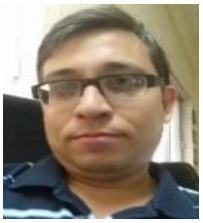
Venkatesh Gauri Shankar
School of Computing and IT, Manipal University, Jaipur

G. Suseendran
VELS University, Chennai

TUTORIAL AND WORKSHOP CHAIRS

Basabi Chakraborty
Department of Software & Information Science
Iwate Prefectural University, Iwate Ken, Takizawa, Japan

Shamik Misra
Escalation Engineer, Microsoft India (R&D) Pvt. Ltd., Bangalore



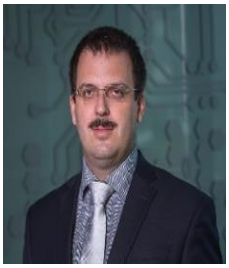
Saptarsi Goswami
Computer Science, Bangabasi Morning College University of Calcutta, Kolkata

TECHNICAL PROGRAM CHAIRS

Neha Sharma
Founder Secretary, Society for Data Science

Amlan Chakrabarti
ACM Distinguished Speaker; Dean, Faculty of Engineering, UoK, Director and Professor, A.K.Choudhury School of Information Technology

Valentina Emilia Balas
Professor, Department of Automatics and Applied Software faculty of Engineering, University of Arad, Romania



Jan Martinovic
IT4Innovations, VSB – Technical University of Ostrava, Czech Republic

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Col. Inderjit Singh Barara
Technology Evangelist, Solution Architect and a Mentor

Biswajit Patra
Design Director, Intel, India

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Joy Mustafi
Director & Principal Researcher @ Salesforce AI, Founder and President, MUST Research

Sabyasachi Mukhopadhay
Chief Research Officer, Root Alpha Facebook Kolkata Developer Circle community lead

PUBLICATION CHAIR

Manjaiah D. H.
Professor, Department of Computer Science, Mangalore University

Malini M. Patil
J S S Academy of Technical Education, Dr.Vishnuvardhan Road, Bengaluru

*(**Annexure B**-Conference Technical Programme Committee List)*

6. CONFERENCE OPERATING MODEL - Preparation of the Event

Every conference has its own model of operation in organizing the event. ICDMAI-2020 opted to serve as a vehicle for thought-leaders, academicians, researchers and industry personnel, to have a spirited debate and discussion on the many advances and challenges in the field of Data Management, Analytics and Innovation and at the end propose creative solutions to combat the challenges in these areas. Keeping **QUALITY** as single point agenda, we started preparations for this mega event around 14 months back. Various activities of the conference were identified and accordingly timeline was prepared. Also, various roles for the conference were finalized and the responsibilities were defined. General Chair, Technical Programme Chairs and other committee chairs / members were appointed.

To elevate the level of the conference and give it a wide visibility, it was decided to host it at the national capital, Delhi. The venue was selected as "The United Services Institution of India" due to its proximity to the airport and high security. Academic and corporate leaders were approached to support the conference and Springer was approached to be the Publication Partner. Experts and researchers from academia and industry were approached to take up the responsibility to review the papers submitted to ICDMAI-2020. It was decided after a rigorous brainstorming session, that there should be four tracks in the conference in order to cover all the aspects of Data Management, Analytics and Innovation and encourage inter-disciplinary research. A Call for Paper was released with deadline for paper submission, notification and registration.

An exclusive website (**http://www.icdmai.org**) of the conference was updated with the relevant

information, keeping in view the need of communication with researchers, reviewers and guests. The website helped the prospective paper presenters and delegates in getting important details such as guidelines for papers submission, important dates with respects to submission of papers, venue of the conference, etc. We registered with conference management portal, **easychair** to provide a hassle free interface to authors for paper submission, smooth paper review and unbiased paper selection process. The conference was registered on various conference alert websites and simultaneous email blast was done to reach out to the research community and provide the wide publicity to the mega event.

Conference budget was prepared and sponsorship brochures were sent to prospective industries and academic institutions. Rigorous efforts were taken to outreach to educational institutions, corporates, government and industry for support and patronage. A diligent effort was made to identify the Keynote Speakers and Resource Persons for Invited Talks, experts for Tutorials / Workshops, Chief Guests, Guest of Honor as well as other Guests. Application to seek permission from Ministry of External Affairs, Home Affairs and Nodal Ministry was submitted was submitted to Indian Government and international attendees were supported / guided to get visa.

The beautifully crafted programme schedule of the conference promised it to be more than a just another "talk shop". Delegates and participants got many insights after listening to the variety of research works which are being carried out across the globe. The participants got an opportunity to listen to many eminent personalities of the world, in their keynote, plenary talks and panel discussion. Besides, the conference showcased workshops and tutorials by leaders from industry and academia. To add on, there was Best Paper Award in all the four tracks. Finally, a press release was given to brief the media and readers about the conference, countries participating, guests, speakers, and quality of paper submitted and other highlights of the conference.

7. DIGNITARIES AT ICDMAI 2020

Dr. Neeraj Saxena is currently holding a position of Adviser-II, Policy & Academic Planning Bureau, AICTE. He was heading the Resource Cell, Horizon Scanning Unit & Sugar Technology Unit of TIFAC. He was a member of the team that prepared Technology Vision 2035 for the country. He was deeply involved in preparing a roadmap for Education as part of Vision 2035 exercise, first-ever foresight initiative undertaken for the sector in the country!

As a part of the team implementing projects emerging out of Technology Vision 2020 (released by TIFAC in 1996), between 2000 and 2010, Dr. Saxena piloted the activities of Mission REACH (Relevance & Excellence in ACHieving new heights in educational institutions), a a major initiative to reorient the higher science & technical education and make it 'relevant' to industries. He was instrumental in establishment of 35 TIFAC-Centres Of Relevance & Excellence (COREs) ever since this Mission got underway on October 4, 2000. The COREs as co-created entities strive for academic, research and technical excellence in an area that interests the user industries or organizations.

Dr. Saxena was selected by the Department of Science & Technology (DST) to undergo an Executive Education Program on "Science, Technology & Innovation Policy" at the JF Kennedy School of Government at the Harvard University in 2006. He was trained in 'Project Management for World Bank-funded projects' at the International Training Center of the ILO, in Turin (Italy) in 2008. He was part of the team that worked on Detailed Project Report for National Innovation Program (NIP) for India in 2008 and also Member-Secretary of the Working Group for "S&T in SMEs" for the 12th Five Year Plan (2007-2012) of the Govt. of India.

He has been involved in the preparation of the Detailed Project Report for National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) being launched by the DST. He got his doctoral degree in Physics for his work in the area of Acoustic Remote Sensing & its application to Air Pollution, carried out at the National Physical Laboratory, New Delhi. He was involved in establishing the country's first indigenous Doppler Sodar capable of remotely profiling wind and turbulence in the lower atmosphere.

Professor Alfred M. Bruckstein, BSc, MSc in EE from the Technion IIT, Haifa, Israel, and PhD in EE, from Stanford University, Stanford, California, USA, is a Technion Ollendorff Professor of Science, in the Computer Science Department there, and is a Visiting Professor at NTU, Singapore, in the SPMS. He has done research on Neural Coding Processes, and Stochastic Point Processes, Estimation Theory, and Scattering Theory, Signal and Image Processing Topics, Computer Vision and Graphics, and Robotics. Over the years he held visiting positions at Bell Laboratories, Murray Hill, NJ, USA, (1987-2001) and TsingHua University, Beijing, China, (2002-223), and made short time visits to many universities and research centers worldwide. At the Technion, he was the Dean of the Graduate School, and is currently the Head of the Technion Excellence Program.

C. Mohan is currently an IBM Fellow at the IBM Almaden Research Center in Silicon Valley and a Distinguished Visiting Professor at Tsinghua University in China. He has been an IBM researcher for 37 years in the database and related areas, impacting numerous IBM and non-IBM products, the research and academic communities, and standards, especially with his invention of the wellknown ARIES family of database locking and recovery algorithms, and the Presumed Abort distributed commit protocol. This IBM (1997), ACM (2002) and IEEE (2002) Fellow has also served as the IBM India Chief Scientist (2006-2009). In addition to receiving the ACM SIGMOD Innovations Award (1996), the VLDB 10 Year Best Paper Award (1999) and numerous IBM awards, Mohan was elected to the US and Indian National Academies of Engineering (2009) and named an IBM Master Inventor (1997). This Distinguished Alumnus of IIT Madras (1977) received his PhD at the University of Texas at Austin (1981). He is an inventor of 50 patents. He is currently focused on Blockchain, Big Data and HTAP technologies (http://bit.ly/CMbcDB, http://bit.ly/CMgMDS). For 2 years, he has been an evangelist for private blockchains and the myth buster of public blockchains. Since 2016, Mohan has been a Distinguished Visiting Professor of China's prestigious Tsinghua University. He has served on the advisory board of IEEE Spectrum, and on numerous conference and journal boards. Mohan is a frequent speaker in North America, Europe and Asia, and has given talks in 40 countries. He is very active on social media and has a huge network of followers. More information can be found in the Wikipedia page at http://bit.ly/CMwIkP

Klaus McDonald-Maier,
Professor, School of Computer Science and Electronic Engineering (CSEE) at University of Essex, UK

Sangeet Saha,
Senior Research Officer, School of Computer Science and Electronic Engineering, University of Essex, UK

Dinanath Kholkar is Vice President and Global Head of the Analytics & Insights unit of Tata Consultancy Services (TCS). As a Data and Analytics specialist he has been an advisor to client CxOs and Boards of companies in helping them realize the power of data, analytics and Artificial Intelligence (AI). In a career spanning 3 decades in TCS, Dina has held various leadership roles including heading TCS' $2 Billion Business Process Services (BPS) unit and as CEO & MD of TCS eServe. He has been providing industry leadership to the IEEE Pune section for over 15 years and has been re-appointed Chairman for the Section for 2019. Under his leadership, the section is running special projects on Affordable Agriculture, STEM to STEAM and Smart City Data Hackathon; all significant contributors to Nation development. He is also the member of the NASSCOM BPM council and the member of the Board of Governors of his alma-mater VJTI. As one of the champions for Diversity & Inclusivity he has led from the front on various initiatives.

Anupam Basu is presently working as a Director at NIT, Durgapur. Prior to this appointment, he was professor at the department of computer science engineering in IIT Kharagpur. He has previously taught at the University of California, Irvine, and University of Guelph, Ontario as visiting faculty.

Biswajit Patra working in Intel India as Director Engineering & technologist ("Principal Engineer") for low power & high performance SOC design in advance technology nodes. Mr. Patra has previously worked as "Principal Engineer" in SOC physical design convergence and signoff team at Qualcomm, Bangalore, India. He was part of more than 50+ complex wireless SOCs tape out in starting in 90nm, 65nm, 45nm, 28nm, 20nm, 10nm & 7nm design node. Author for more than 25 papers in national and international journals /conference in low power SOC design.

Lipika Dey is a Principal Scientist at Tata Consultancy Services, India. She leads the research initiatives for Analytics and Insight Business unit. Her research interests are in the areas of Natural Language Processing, Text and Data Analytics, Machine Learning and Semantic Search. Lipika did her Integrated M.Sc. in Mathematics, M.Tech in Computer Science and Data Processing and a Ph.D. in Computer Science and Engineering - all from IIT Kharagpur, India. Prior to joining TCS in 2007, she was a faculty at the Department of Mathematics at IIT Delhi, India from 1995 to 2007. She was conferred the Distinguished Scientist award in TCS in the year 2010. She has several publications and patents to her name.

Aninda Bose is presently working as a Senior Publishing Editor with Springer Nature. Mr. Bose is part of the Global Acquisition Team at Springer Nature and responsible for acquisition of scientific content across the globe. He is responsible for acquisition of content in Interdisciplinary Applied Sciences. He has more than 25 years of industrial experience in marketing and different fields of publishing. Mr. Bose has completed Masters in Organic Chemistry from Delhi University and Masters in Marketing Research from Symbiosis Institute of Management Studies, Pune. Mr. Bose has

delivered more than 110 invited talks on Scientific Writing and Publishing Ethics in reputed Universities, International Conferences and Author Workshops. He has published books for secondary level in Chemistry and is a member of American Chemical Society, USA.

Kranti Athalye is a Sr. Manager with IBM India University Relations. She had 18 years of industry experience and is currently working on Employer branding and Technology Evangelism across Domestic Universities and Colleges. She has worked as a delivery manager in the IBM Cloud domain as well as the Network Management domain when she worked in AT&T in the US. She has a Master's degree in Computer Science and Mathematics from the University of Illinois at Chicago. She has received the Best People Manager Award – IBM India/South Asia in 2011. She was a keynote speaker at the 2017 NAO Robot Users and Developers Conference at Boston.

Mrityunjoy Pandey is a Manager, Cognizant with 13 years of Software Testing experience. He has completed his MS in Software Engineering from BITS Pilani. He has extensive experience in validating Amazon Webservices based Data Warehouse Architecture including S3, Oracle Cloud, Redshift and Presto, Informatica Cloud MDM. He also has diverse experience in Software Testing across business domains include Banking, Insurance, Travel, Hospitality, retail across application types, including 2+ years in scrum team.

Amit Agarwal is a B.Tech. in Computer Science and experienced with end-to-end deep learning projects for NLP & Computer Vision in production. He is working as a Data Scientist with Abzooba and actively involved in Solution & Architect designs for projects as well as sprint plans. Amit has handled client relations and deliveries while working with a geographically distributed team in India & United States of America from client premises.

Ishant Wankhede did his B.Tech. from IIT, Guwahati and currently working as a Data Scientist with Abzooba. His areas of interests are Deep Learning, Convolutional Neural Networks, Sequence Models etc.

Kaushik Dey is Head of AI/ML & Big Data Practice, Ericsson and has more than 20 years of experience across Product & Solution development, Data Strategy and Architecture, Technology Consulting, Practice & P&L Management. He had successfully implemented Data Engineering and Data Science / ML solutions in US, Europe and Asia. Experienced in Conceptualising, Design and Development of new AI enabled Products like, Digital Experience Platform with Recommendation Engine for intelligent behavioral recognition/ response and Self-healing Networks with prediction and automated prescription mechanism.

Rangaraj is a Deputy Director (Technical) National Institute of Wind Energy

M. Selva Balan is a Scientist and head of Hydraulic Instrumentation division at Central Water and Power Research Station (CWPRS). He is a post-graduate in Electronics and Communication. He has professional experience over 20 years and has an extensive experience in Hydraulic automation.

Sugata Sen Roy is a professor and the Head of Statistics Department in the University of Calcutta. He is a PhD in Statistics with research experience of more than 30 years. His research interests include Time Series Analysis, Regression Analysis, Econometrics, Survival Analysis, Development Statistics, Functional data Analysis.

Amol Dhondse is an IBM Certified senior IT Architect, Open Group Master Certified Architect and TOGAF Certified. He has over 18 years of experience in the IT Industry and 10 years in Architecture profession. Amol is a Master Inventor and has filed 40 patents, 10 granted and 6 published in areas such as AI, Cognitive, Cloud, APIfication and IoT. Amol brings with him strong technical understanding of Social, Portal, Content Management, Mobile Solutions, Enterprise, Application, Middleware, Big Data, Systems/ Infrastructure and Design & Architecture. He has domain expertise in Manufacturing, Energy Utilities and Telco Industry. Amol is active among multiple IBM technical communities as a technical evangelist and thought leader and is leading multiple initiatives within the IBM Academy of Technology & its affiliates. Amol is IBM Recognized Speaker and prolific speaker has presented white papers in Regional Technical exchanges, external forums and invited in various universities to conduct workshops on AI, ML, IoT and Digital transformation.

Anindita Bandyopadhyay is working as an Assistant Manager – Data Analytics & Automation CoE at KPMG. She did her MSc in Data Science and Analytics from University of London and has over 8 years of experience in different facets of Management Consulting. She has worked on Energy, Healthcare and Social Analytics projects.

Kuldeep Singh is a seasoned AI practitioner and Technology architect, skilled in ML, DevOps Implementation and Cloud Infrastructure setup with Agile mindset. With 12+ years of experience, he brings with himself a unique expertise in integrating business domain with traditional as well as emerging new IT landscape. He has been involved with the world's leading consulting and tech firms and holds MBA from IMT along with PGP in Big Data and Machine Learning from GreatLakes. He is an active member of ODSC, Delhi Chapter.

Rita Bruckstein is a Director at Technion R&D Foundation Ltd. She is an experienced Research Authority Director with a demonstrated record of working in one of the most prestigious Israeli higher education institute. Rita is skilled in Research and Development (R&D), Research administration, H2020 and FP7. Strong research administration professional with a MBA focused in Financing from Bar-Ilan University.

Sonal Kukreja is a PhD Scholar working in copyright protection and authentication of digital images. She had completed her Masters in 2015 and started her PhD in 2016. She is a passionate academician and researcher. She also started her own venture TenByTen (www.tenbyten.io) in 2016. Through this, she collaborates with people of different age groups from different parts of the world, to earn programming and work on different projects. She has been specifically working with kids (6-10 years old) and people above 60, to make them understand current AI and ML world, and have successfully completed various projects and research publications.

8. VENUE OF ICDMAI 2020

The United Service Institution of India is a national security and defence services think tank based in New Delhi, India. It was founded in 1870 and describes its aim as the "furtherance of interest and knowledge in the art, science and literature of the defence services". USI operates centres for research in various areas of national security and is the apt location for this conference. It has enlarged its activities and developed into a modern complex spread over three acres. USI is an ultramodern residential complex and a one stop address for all business interactions, Ideal for corporate events like seminars, conferences, meetings, workshops and presentation.

9. PARTNERS FOR ICDMAI 2020

IBM India Private Limited is the Indian subsidiary of IBM. It has facilities in Bengaluru, Ahmedabad, Delhi, Kolkata, Mumbai, Chennai, Pune, Gurgaon, Noida and Hyderabad. IBM is the multinational company with the largest number of employees in India.

Springer is a leading global scientific, technical and medical portfolio, providing researchers in academia, scientific institutions and corporate R&D departments with quality content through innovative information, products and services. Springer has one of the strongest STM and HSS eBook collections and archives, as well as a comprehensive range of hybrid and open access journals. The publication partner for the conference is their prestigious AISC Series.

Ericsson India Private Ltd. operates as a manufacturer of telecommunication equipment. The Company provides wire telephone, cell telephone, and telegraph equipment. Ericsson India also offers digital, networks, managed services, and IT solutions. Ericsson India serves customers worldwide.

Wizertech Informatics Pvt Ltd is an ISO9001: 2008 certified IT Infrastructure Consultancy & System Integration company headquartered in Kolkata, India, with a strong presence in more than a dozen key cities of India. Since inception, a decade ago, we have diversified extensively to evolve into one of the largest System Integrators in Eastern India. Over the decade, we have augmented technical manpower, and gained experience in multiple domains. This coupled with an ever-increasing list of satisfied customers, has positioned us among the coveted names in the arena.

NIELIT, Kolkata (formerly DOEACC Society Kolkata Centre since 14.12.2002 and prior to that Regional Computer Centre, Calcutta) is one of the oldest IT houses in eastern region imparting IT Education and Training for more than 30 years. The Centre was established in 1976 as a Registered Scientific Society (Autonomous Body) by the Central and West Bengal Governments.

Indian Institute of Science Education and Research (IISER) Kolkata is an autonomous public research university in science and education field located in Nadia district, West Bengal, India. It was established by the Ministry of Human Resource Development in 2006 and promoted to the status of an Institute of National Importance in 2012 vide the NIT Amendment Act. It is one of seven Indian Institutes of Science Education and Research, and was the first of the IISERs to be established along with IISER Pune.

REDX brings together technical experts, innovators, researching institutions, implementation partners and corporate partners that will allow us to solve the most pressing challenges within our communities. REDX labs and clubs serve as gateways to the energy and creativity of innovators who are creating solutions to satisfy significant social needs.

10. ITINERARY

Date/Time		Min(s)	Track I	Track II	Track III
FRIDAY 17-January 2020	08:00 - 10:00	120	Tea and Registration		
		Venue ->	Seminar Hall No. 2	Seminar Hall No. 3	Seminar Hall No. 4
	10:00 - 11:00	60	**Kranti Athalye** Sr. Manager University Relations, IBM ***Artificial Intelligence and Cognitive Systems***	**Sugata Sen Roy** Head of the Department. Statistics University of Calcutta ***Time Series Modeling***	**Anindita Bandyopadhyay** Assistant Manager KPMG ***Data Science in Medical Domain Case Study***
	11:00 - 11:30	30	**Mritunjoy Pandey** Manager - Cognizant ***Neural Network - Tuning***		**M.Selva Balan** Scientist and head of Hydraulic Instrumentation division CWPRS ***ML and DNN Based techniques for water resources and Flood***
	11:30 - 11:45	15	Tea Break		
	11:45 - 13:30	105	**Amit Agarwal, Ishant Wankhede** Abzooba India Infotech Private Limited ***A Recurrent Neural Pipeline for Multi-Class | Multi-Label Text Classification***	**Sugata Sen Roy** Head of the Department. Statistics University of Calcutta ***Time Series Modeling***	**Kuldeep Dunham** ODSC Delhi Chapter ***Leverage Docker and Kubernetes for DS, ML and AI Workflow and Workload setup***
	13:30 - 14:30	60	Photo Session followed by Lunch		
	14:30 - 15:30	60	**Kaushik Dey** Head of AI/ML & Big Data Practice, Ericsson ***Algorithms at Edge leveraging decentralized learning***	**Amol Dhondse** Senior Solution Architect, IBM ***State of Art in AI world with Transfer Learning***	**Rita Bruckstein** **Director, Technion R&D Foundation Ltd.** *European Commission procedures related to Data Management in their research funding schemes*
	15:30 - 15:45	15	Tea Break		
	15:30 - 16:30	60	**Rangaraj** Deputy Director (Technical) National Institute of Wind Energy ***NIWE's Wind Power Forecasting experience with Indian dataset***	**Sonal Kukreja** Founder & Chief Mentor at TenByTen.io; Computer Vision ***Building License Plate Recognition System with OpenCV***	**C Mohan** IBM Fellow, IBM Almaden Research Center ***Artificial Intelligence (AI) : Past, Present and Future***

SATURDAY 18-January-2020	08:00 - 10:00	120	Registration & Networking				
	10:00 - 11:00	60	Inauguration Function				
	11:00 - 11:20	20	Keynote Address 1: **Alfred Bruckstein, Technion** - Israel Institute of Technology, Faculty of Computer Science, Israel				
	11:20 - 11:40	20	Keynote Address 2 : **C. Mohan**, IBM Fellow, *IBM Almaden Research Center in Silicon Valley*				
	11.40-12:00	20	Tea Break				
			Venue	Seminar Hall No. 2	Seminar Hall No. 3	Auditorium	Seminar Hall No. 4
	12:00-13:00	60	Session 1	Track 1 (Data Management and Smart Informatics)	Track 2 (Big Data Management)	Track 3 (Artificial Intelligence and Data Analytics)	Track 4 (Advances in Network Technologies)
	13:00 - 14:00	60	Photo Session followed by Lunch				
			Venue: Auditorium				
	14:00 - 14:20	20	Keynote Address 1: **Dinanath Kholkar,** Vice President, Global Head of the Analytics & Insights unit of Tata Consultancy Services				
	14:20 - 14:40	20	Keynote Address 2: **Biswajit Patra**, Director Design, Intel, India				
	14:40 - 15:00	20	Panel Discussion: **Data Science for Immersive Societal Applications** Panelist: Alfred Bruckstein, Dinanath Kholkar, C. Mohan, Kranti Athalye | Moderator - Col Inderjeet				
			Venue	Seminar Hall No. 2	Seminar Hall No. 3	Auditorium	Seminar Hall No. 4
	15:00 - 16:00	60	Session 2	Track 1 (Data Management and Smart Informatics)	Track 2 (Big Data Management)	Track 3 (Artificial Intelligence and Data Analytics)	Track 4 (Advances in Network Technologies)
	16:00 - 16:15	15	Networking Break (Tea)				
	16:15 Onwards		Cultural Evening & Banquet Dinner				

SUNDAY 19-January-2020	08:00 - 10:00	60	Registration & Tea				
	10:00 - 10.20	20	Keynote Address 1: **Aninda Bose** - *Senior Publishing Editor, Springer India Pvt. Ltd.*				
	10:20 - 10:40	20	Keynote Address 2: **Anupam Basu**, *Director, National Institute of Technology, Mahatma Gandhi Avenue, Durgapur, West Bengal, India*				
			Venue	Seminar Hall No. 2	Seminar Hall No. 3	Auditorium	Seminar Hall No. 4
	10:40 - 11:40	60	Session 3	Track 1 (Data Management and Smart Informatics)	Track 2 (Big Data Management)	Track 3 (Artificial Intelligence and Data Analytics)	Track 4 (Advances in Network Technologies)
	11:40 - 11:55	15	Tea Break				
			Venue: Auditorium				
	11:55-12:15	20	Keynote Address 1: **Sangeet Saha**, Senior Research Officer, School of Computer Science and Electronic Engineering, University of Essex, UK				
	12:15-12:35	20	Panel Discussion: **Reinventing Cyber security with Artificial Intelligence** Panelist: Anupam Basu, Biswajit Patra, Masood Parvania, Lipika Dey | Moderator - Prof. Amlan Chakrabarti				
	12:35 - 13:35	60	Photo Session followed by Lunch				
			Venue	Seminar Hall No. 2	Seminar Hall No. 3	Auditorium	Seminar Hall No. 4
	13.35 - 15:00	85	Session 4	Track 1 (Data Management and Smart Informatics)	Track 2 (Big Data Management)	Track 3 (Artificial Intelligence and Data Analytics)	Track 4 (Advances in Network Technologies)
			Venue: Auditorium				
	15:00 - 15:20	20	**Session by Society for Data Science Team**				
	15:20 - 15:40	20	Valedictory Keynote: **Lipika Dey**, *Principal Scientist, Innovation Labs, Tata Consultancy Services, New Delhi, India*				
	15:40 - 15:50	10	Valedictory Plenary Talk: **Masood Parvania**, *Electrical and Computer Engineering, University of Utah, United States*				
	15:50 - 16:00	10	**Award Distribution**				

11. EXECUTIVE SUMMARY

Day 01: 17 January 2020 (Pre-Conference Workshops / Tutorials)

ICDMAI 2020 commenced on 17th January 2020 with a warm welcome to the tutorial speakers and participants in a chilly morning at United Services Institution of India (USI), New Delhi. The pre-conference activities included three separate tracks of workshops and tutorials by different Data Science professionals and subject matter experts from industries and academia. The pre-conference activities are the prelude to the conference and to create the environment of engaging the participants with cutting-edge Data Science, Data Management and Analytics techniques. This endeavor is not only to touch upon the up-to-date studies on Machine Learning and Artificial Intelligence, but also to offer a space for networking amongst people from diversified domains across the industries and academic institutions.

The programme started on scheduled time at 10:00 a.m. with the registration for speakers, audiences, students and other delegates from all over the country and abroad. Post registration there was a tea arrangement with a short introductory networking session for the attendees.

Participants Registering for ICDMAI 2020

The tutorials began at 10:00 a.m. in three simultaneous tracks at different seminar rooms of USI. Following are the workshop/tutorial sessions' gist held till 4:30 p.m. There were two tea breaks and a lunch break in between. The Track 1 was coordinated by Ms. Kreena Joshi, Track II was managed by Shafique Khan and Track III was handled by Chirag.

TRACK 1:

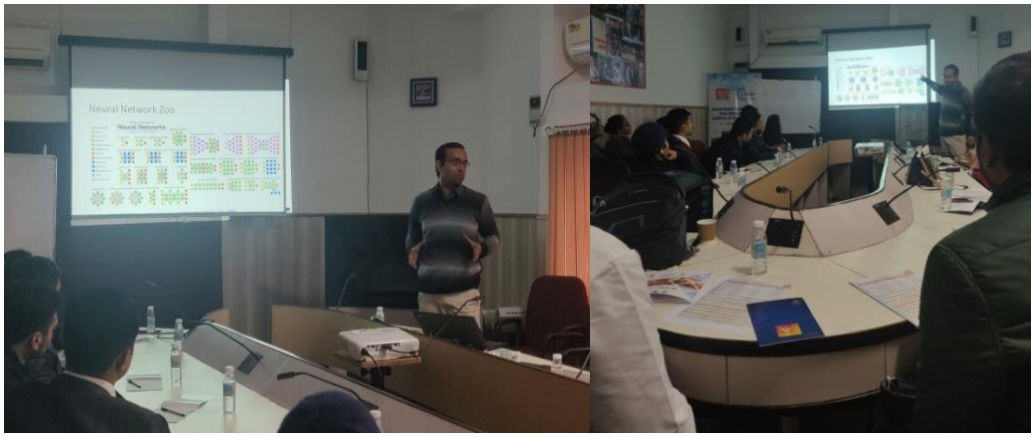
Tutorial Talk 1: Artificial Intelligence and Cognitive Systems (17-January-2020, 10:00 – 11:00)

Kranti highlighted that AI and Cognitive Computing imply that computers are now responsible for performing job functions that a human used to perform. However, there is a big difference between both of them. She explained that Cognitive Computing tries to replicate how humans would solve problems while AI seeks to create new ways to solve problems that can potentially be better than humans. Cognitive Computing is important in analysis intensive industries such as Finance, Marketing, Government and Healthcare Data. AI is important in service-oriented industries such as Healthcare, Manufacturing and Customer Service.

Kranti Athalye, Sr. Manager University Relations, IBM delivering the Tutorial Talk at ICDMAI 2020

Tutorial Talk 2: Neural Network - Tuning (17-January-2020, 11:00 – 11:30)

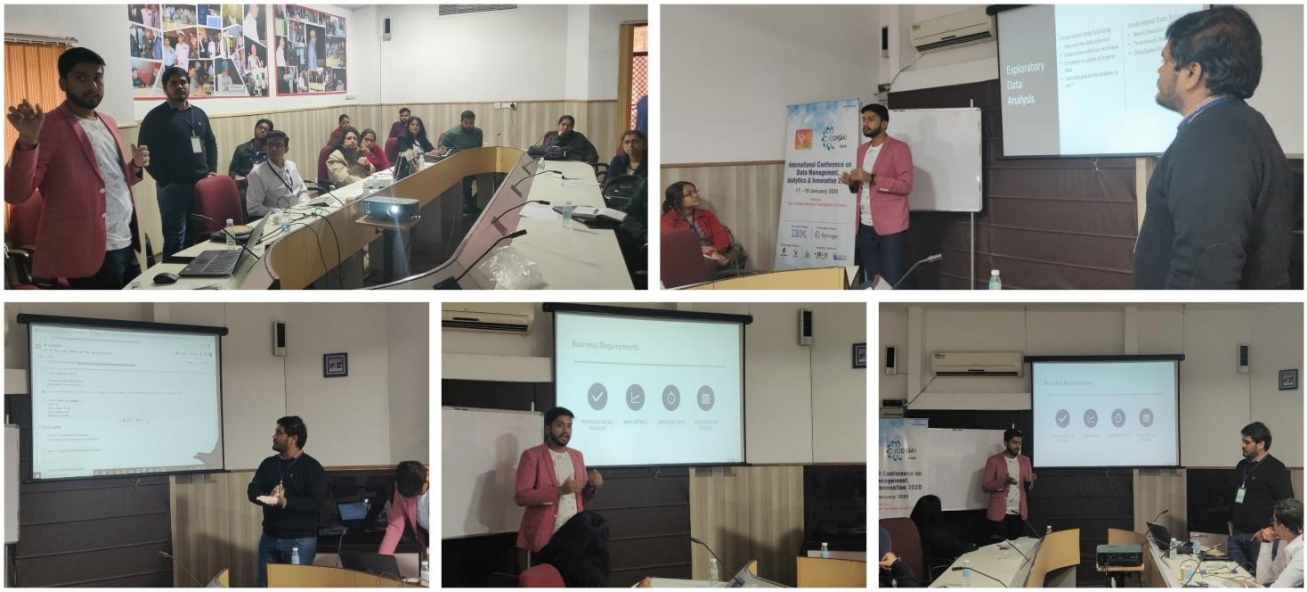
Mritunjoy shared that neural networks can be difficult to tune. If the network hyperparameters are poorly chosen, the network may learn slowly, or perhaps not at all. His talk aimed to provide some baseline steps one should take when tuning the network and discussed many tips.



Mritunjoy Pandey, Manager – Cognizant delivering the Tutorial Talk on 17 January at ICDMAI 2020

Tutorial Talk 3: A Recurrent Neural Pipeline for Multi-Class / Multi-Label Text Classification (17-January-2020, 11:45 – 01:30)

Amit and **Ishant** gave a conceptual overview of what MM Text Classification entails followed by the approach around it. The focus of this tutorial was to understand the problem of Multiclass Multilabel (MM) Text Classification in NLP and talk about tangible concepts which can be leveraged using state-of-the-art tools and techniques to build deep learning models to tackle this problem. Once the audience got some foundational knowledge around MM Text Classification, the experts showcased their novel approach in handling such problem statements using Deep Learning via a Hands-on-Session. Sample problem discussed was of "Identifying Categories & Sub-Categories from Text". Examples like Stack-overflow Question Classification into Categories (NLP/Computer Vision/Arts) and Sub-categories (embeddings/neural-network/model-weights/design) were shared for better understanding.



Amit Agarwal & Ishant Wankhede, Data Scientist, Abzooba India Infotech Private Limited delivering the Tutorial Talk

Tutorial Talk 4: Algorithms at Edge leveraging decentralized learning (17-January-2020, 14:30 – 15:30)

Kaushik discussed the problem of network behavior prediction has been an ongoing study by researchers for quite a while now. Network behavior typically exhibits a complex sequential pattern and is often difficult to predict. Nowadays there are several techniques to predict the degradation in Network KPIs like throughput, latency etc., using various machine learning techniques like Deep Neural Networks, where the initial layers have learnt to map the raw features like performance counter measurements, weather, system configuration details etc into a feature space where classification by the final layers can be performed.

Given the initial number of counters (which constitutes the dimensions) is substantial (more than 2000 in number) the problem requires huge amount of data to train the Deep Neural Networks. Often this needs resources and time and more importantly this requires provisioning of huge amount of data for every trial. Given each node generates huge amount of data (data on every 2000 counters generated at 15 minutes interval for each of 6 cells in an eNodeB) and the data needs to be transported across several hundred of eNodeBs to one central data center, it requires a very fat data pipe and consequently huge investment to enable a predictive fault prediction apparatus across the network.

The alternative is to have a compute infrastructure at the node and take the intelligence at the edge. However, the challenge is given the huge amount of data generated in a single node having a compute at

each node was proving to be expensive. Nowadays this compute requirement at node could be reduced through use of transfer learning. However, the other challenge is on sharing the intelligence and developing a system which is collectively intelligent across nodes.

Network topology, climate features and user patterns vary across regions and service providers and hence a unique model is often necessary to serve the node. However, in order to deal with unseen patterns intelligence from other nodes can be useful which leads us to building an global model which again leads to the challenge of fat data pipeline requirement which makes it commercially less attractive.

In order to get around this challenge, a combination of federated learning is used in combination with transfer learning.

The presentation covered such deep learning architectures which combines federated learning with transfer learning to enable construction and updation of Global models which imbibes intelligence from nodes but can be constructed by a consensus mechanism whereby weights and changes to weights of local models are shared to global. Also, the local models are periodically updated once global model.

Kaushik Dey, Head of AI/ML & Big Data Practice, Ericsson, delivering the Tutorial Talk on 17 January at ICDMAI 2020

Tutorial Talk 5: NIWE's Wind Power Forecasting experience with Indian dataset (17-January-2020, 15:30 – 16:30)

Rangaraj shared that under the direction of Ministry of New & Renewable Energy - Government of India (MNRE), National Institute of Wind Energy (NIWE) has assessed India's wind power potential at 100m hub height with scientific rigor and based on authentic latest available data-sets of wind as well as land geologically spread across India. He further added that this information is essential for the Policy makers, Private players, Government Agencies and other stakeholders of the industry to move towards achieving the ambitious goal of 60,000 MW of wind power by 2022 as envisaged by the government. NIWE (formerly C-WET) had already performed the potential estimation study corroborating meso-scale derived wind maps and micro-scale measurements and released Indian Wind Atlas at 50m and indicative values at 80m hub heights with 5km resolution in April 2010 in collaboration with RISO-DTU, Denmark.

NIWE has chosen advanced modeling techniques and revisited this study as per the guidance and directives of MNRE / Govt. of India, with realistic and practical assumptions and estimated the wind power potential at 100m height as 302 GW. The complete details may be obtained from Wind Power Potential 100M agl. The expert finally shared that NIWE has carried out Geophysical survey at about 365 sq.km (70 sq.km under FOWPI project) in Gulf of Khambhat, Gujarat for the proposed 1 GW offshore wind farm project to ascertain the nature of subsurface and soil profile available at recommended depths for the design of foundation of offshore structures.

Rangaraj, Deputy Director (Technical) National Institute of Wind Energy delivering the Tutorial Talk on 17 January at ICDMAI 2020

TRACK 2:

Tutorial Talk 1: Time Series Modeling (17-January-2020, 10:00 – 13:30)

Prof. Sugata delivered a lecture on a review of the time series techniques as developed over the years. The primary focus was be on the evolution of the Classical model, the Box-Jenkins models and the Volatility models. Various extensions of these models, like the State-space models and multivariate models, were also touched upon. Wherever applicable, the justification for the models was illustrated through suitable examples.

Sugata Sen Roy, Head of the Department – Statistics, University of Calcutta delivering the Tutorial Talk at ICDMAI 2020

Tutorial Talk 2: State of Art in AI world with Transfer Learning (17-January-2020, 14:30 – 15:30)

Amol Dhondse presented a Tutorial Talk on very interesting topic where he shared that the data by itself does not provide value unless we can turn it into actionable, contextualized information. Artificial Intelligence provides us the framework and tools to go beyond trivial real-time decision and automation use cases for IoT. The session started with an overview on Artificial Intelligence and Cognitive Systems, as well as covered many new and interesting areas of Artificial Intelligence using Base Modelling Techniques and Transfer Learning. Further, he discussed about how Transfer Learning can be used with base Artificial Intelligence and Machine Learning Models. He also responded to the queries of the participants in brilliant manner.

Amol Dhondse, Senior Solution Architect, IBM delivering the Tutorial Talk at ICDMAI 2020

Tutorial Talk 3: Building License Plate Recognition System with OpenCV (17-January-2020, 15:30 – 16:30)
Sonal delivered a talk on License Plate Recognition System, which is an excellent example of computer vision systems being deployed into our everyday lives. License Plate Recognition systems are used to automatically detect and recognize license plates in images. From there, the identified license plate can be used to look up information on the owner of the car. This technology is used by police forces around the world for law enforcement purposes to check if a vehicle is registered or licensed. It is also used for electronic toll collection on pay-per-use roads and as a method of cataloguing the movements of traffic, for example by highways agencies. In this talk, she discussed the basics of developing a vehicle license plate recognition system using the concepts of machine learning with Python. She built a computer vision system to localize, segment, and identify the characters in a license plate, and accomplished this goal using image processing techniques, followed by a bit of machine learning.

Sonal Kukreja, TenbyTen delivering the Tutorial Talk at ICDMAI 2020

TRACK 3:

Tutorial Talk 1: Data Science in Medical Domain Case Study (17-January-2020, 10:00 – 11:00)

Anindita took the attention of the participants to healthcare and medical sector data that are being generated every day at the pace of light with ever increasing challenges in different areas viz., from gene expression studies, cancer research and cancer and other critical disease treatments, medical insurance fraudulent transaction, Electronic Medical Reports – name it a few. This humongous volume of mostly unstructured data needs attention. Machine Learning algorithms and Artificial Intelligence are now the new era boons to transform the challenges in efficient solution. The expert covered an interesting case study on Breast Cancer diagnosis using two ML algorithms are compared to come up with the most plausible result to help detect and treat the fatal disease at early stage.

Anindita Bandyopadhyay, Assistant Manager – Data Analytics & Automation CoE, KPMG at ICDMAI 2020

Tutorial Talk 2: ML and DNN Based techniques for water resources and Flood Synopsis (17-January-2020, 11:00 – 11:30)

Selva Balan shared that Central Water and Power Research Station, Khadakwasla, Pune provides specialized services through physical and mathematical model studies in river training and flood control, hydraulic structures, harbours, coastal protection, foundation engineering, construction materials, pumps and turbines, ship hydrodynamics, hydraulic design of bridges, environmental studies, earth sciences, and cooling water intakes. The expert discussed the flood forecasting based on rainfall and the run off model. A runoff model is a mathematical model describing the rainfall–runoff relations of a rainfall catchment area, drainage basin or watershed. More precisely, it produces a surface runoff hydrograph in response to a rainfall event, represented by and input as a hyetograph. In other words, the model calculates the conversion of rainfall into runoff. Based on different statistical models and improved results with DNN architecture with thirteen hidden layer was also discussed. He also explained European satellite data processing techniques which includes optimizing the input bands with GA methods. The results were validated with actual sites across India proves the future on machine learning and strength of AI techniques in water resources and disaster management.

M. Selva Balan, Scientist and head of Hydraulic Instrumentation division CWPRS delivered Talk at ICDMAI 2020

Tutorial Talk 3: Leverage Docker and Kubernetes for DS, ML and AI Workflow and Workload setup (17-January - 2020, 11:45 – 13:30)

Kuldeep Singh, ODSC Delhi Chapter delivered Tutorial Talk on 17 January at ICDMAI 2020

Kuldeep shared that DS, ML and AI has moved very far from just running the models only at your local machine. Nowadays models are running in production and helping the business at decision making, which in turn increased the expectations for continuously running the models and making the changes online but

remember running this at large scale is not an easy task. During his session, participants learnt about one such approach with Docker and Kubernetes which can help us in not only in developing but also deploying models at scale and allow us to use distributed setup.

Tutorial Talk 4: European Commission procedures related to Data Management in their research funding schemes (17-January-2020, 14:30 – 15:30)

Rita shared the guidelines under which the European Commission implements key requirements for the data management and various types of EU support related to funding scheme.

Rita Bruckstein, Director, Technion R&D Foundation Ltd. delivered Tutorial Talk on 17 January at ICDMAI 2020

Tutorial Talk 5: Artificial Intelligence (AI): Past, Present and Future (17-January-2020, 15:30 – 16:30)

Mohan discussed that Artificial Intelligence (AI) has been around for decades but a convergence of big data, increased computing capabilities, and user demand has created a perfect storm where AI applications are evolving at a rapid pace. AI is a fast-paced field with a deep history that is continuing to change and become more complex every day. But what some don't realize is that the AI of today is no longer the AI of the past. AI now has the power to address challenges and predict outcomes like never before – but taking advantage of the opportunity requires understanding where we've been, where AI is going and how to keep pace with this fast-changing industry. Mohan also shared major breakthroughs in AI in 20th Century, enabled by brute-force, heuristics, human coding of rules and knowledge, and simple machine learning (pattern recognition).

- World champion chess machine - IBM Deep Blue
- Mathematical discovery - Proof checkers
- Accident avoiding car - CMU: No Hands Across America
- Robotics - Manufacturing automation, Disaster rescue robots
- Speech recognition systems - Dictation machine
- Computer vision and image processing - Medical image processing
- Expert systems - Rule based systems, Knowledge based systems

C Mohan, IBM Fellow, IBM Almaden Research Center delivered Tutorial Talk on 17 January at ICDMAI 2020

Random Clicks of Experts, Speakers, Participants, Volunteers and Executive Members of S4DS on 17 January at ICDMAI 2020

Day 02: 18 January 2020

(Keynote Address / Plenary Talk / Panel Discussion / Paper Presentations)

The auditorium of United Services Institution of India, New Delhi was properly decked up and other preparations were diligently completed for the Inauguration ceremony.

Completely Decked up Venue for the Inauguration Ceremony on 18th January 2020 at ICDMAI 2020

All the Guests, delegates and participants started arriving since 8.30 am at the Auditorium, for the inauguration function. They registered themselves and had the breakfast.

Guests, Delegates and Participants registering themselves on 18th January 2020 at ICDMAI 2020

The inauguration ceremony begun at 10:00 AM as per the schedule and the agenda for the programme was as given below:

TIME	Min(s)	DETAILS
08.00 am – 10.00 am	120	Registration
10:00 am – 10:05 am	05	Felicitation of Guests on the Dais
10:05 am – 10:10 am	05	Welcome Address by Col. Inderjit Barara, Organizing Committee Chair, S4DS
10:10 am – 10:15 am	05	Introduction of ICDMAI 2020 by Dr. Neha Sharma, Steering Committee Chair, ICDMAI 2020
10:15 am – 10:20 am	05	Release of Abstract Book
10:20 am –10:25 am	15	Address by General Chair, Dr. P.K. Sinha
10:25 am –10:40 am	15	Dr. Neeraj Saxena, Adviser-II, Policy & Academic Planning Bureau, AICTE – Chief Guest
10:40 am – 10:45am	05	Vote of Thanks by Dr. Amlan Chakrabarti, Steering Committee Chair, ICDMAI 2020

At the outset, the anchor of the inauguration ceremony, Ms. Kreena Joshi, briefed the guests and the delegates about the event and the host Institute. She shared with audience that the Society for Data Science has been organizing this conference since 2017 and this year it's even more special as it is being hosted in the national capital our country India. She expressed deep gratitude to the galaxy of professionals and experts from different domains who have come here from all across the globe.

Dignitaries on the Dais at the Inauguration Function of ICDMAI 2020

Ms. Kreena, then invited all the dignitaries on the dais to come forward to light the lamp and give a promising start to ICDMAI 2020. Light and brightness has always been equated with positivity, motivation, harbringer of good and associated with spiritual beings. The lamp is invoked as, "Thamasoma Jyotirgamaya" meaning the lamp leads us from darkness towards light. It is a tradition to light a lamp first before starting any auspicious events or rituals.

Lighting of the Lamp by the Dignitaries to formally Inaugurate ICDMAI 2020

Moving ahead, the Chief Guest (**Dr. Neeraj Saxena**) and Guest of Honor (**Prof. Alfred Bruckstein**) on the dais were felicitated on behalf of ICDMAI 2020.

Felicitation of Dr. Neeraj Saxena by Dr. Amol Goje and Prof. Alfred Bruckstein by Dr. P.K. Sinha at ICDMAI 2020

Col. Inderjit Barara, Organizing Committee Chair, ICDMAI 2020 welcomed all the guest and delegates from various parts of the world. He briefed the audience about formation, philosophy and activities of Society for Data Science. He emphasized that there is a dire need of academia, research community, corporate and professional society's like ours come together and create a sustainable ecosystem that deals with current and futuristic need of the societal problem.

Col. Inderjit Barara delivering a Welcome Address at ICDMAI 2020

Dr. Neha Sharma, Founder Secretary, S4DS and Steering Committee Chair, ICDMAI 2020, gave a comprehensive introduction to the conference. She shared the genesis of the event, vision associated with it and the support received from industry, academia and community at large. She also shared that there are participants from 08 countries, 25 Industries, 80 International and Indian Universities (IITs, NITs, IISER etc). She mentioned that out of 514 papers submitted to ICDMAI 2020, only 12% ie. 62 papers are selected for oral presentation after a rigorous review process. She promised that this conference will not be just another "talk shop", but would provide an opportunity to listen to many eminent personalities of the world, in their keynote, plenary talks and panel discussion. She also shared the details of workshop and tutorials by leaders from industry and academia, on 17th January 2020. On behalf of core committee, she appreciated the bonhomie and support extended by IBM since last 03 years, Wizertech since last 02 years, Springer since last 03 years, Ericsson, NIELIT-Kolkata, IISER-Kolkata and REDX-Kolkata. She also acknowledged the contribution of the advisory body members, technical programme committee, people from industry and academia, reviewers, session chairs, media, authors and every single soul, who have been instrumental shaping up the conference.

Dr. Neha Sharma presenting the Information and Statistics of ICDMAI 2020

The anchor, Ms. Kreena, invited all the dignitaries on the dais to release the abstract book for ICDMAI 2020.

Release of Abstract Book during the Inauguration Ceremony of ICDMAI 2020

Going forward, **Dr. P. K. Sinha**, Vice Chancellor & Director of International Institute of Information Technology (IIIT), Naya Raipur and General Chair - ICDMAI 2020, welcomed all the guests and delegates. Sir shared that ICDMAI made a humble beginning in 2016 in India has become truly international in just few years. The past versions of this conference saw eminent scientists, engineers and academicians delivering keynote speeches and invited talks, thus providing enriching experience for the participants. He said that he is sure that this year's version is going to be much more interesting. Further, sir said that with increasing use of data analysis for decision making in all spheres of our modern society, today Data Science has become main stream in all domains, be it science, engineering, finance, marketing or any other area. Most of today's business and research decisions as well as disruptive innovations are data-driven. In next few decades, several disruptive technologies based on data-driven innovations are going to impact our social ecosystem. Hence, the conference is very topical.

Dr. P.K. Sinha, General Chair, ICDMAI 2020 - Welcoming the Delegates and Explaining the Relevance of the Conference

Proceeding further, the Chief Guest, **Dr. Neeraj Saxena**, Adviser-II, Policy & Academic Planning Bureau, AICTE, addressed the gathering and complemented on organizing a conference on a very contemporary topic. He spoke about "Emerging Technology and Changes in Education" and shared that Data Science (DS) is one of the prime focus area of AICTE. It's a plan to introduce DS and AI as an elective course for Engineering and Technology discipline as well as design a model curriculum for degree and honors course. Sir also shared few quality initiatives by AICTE like examination reform, internships, MOOCs, technical teacher's training, innovative / start-up policy, industry-institute collaboration etc. The talk was very informative and well appreciated by the participants.

Keynote Address by the Chief Guest, Dr. Neeraj Saxena, Adviser-II, Policy & Academic Planning Bureau, AICTE

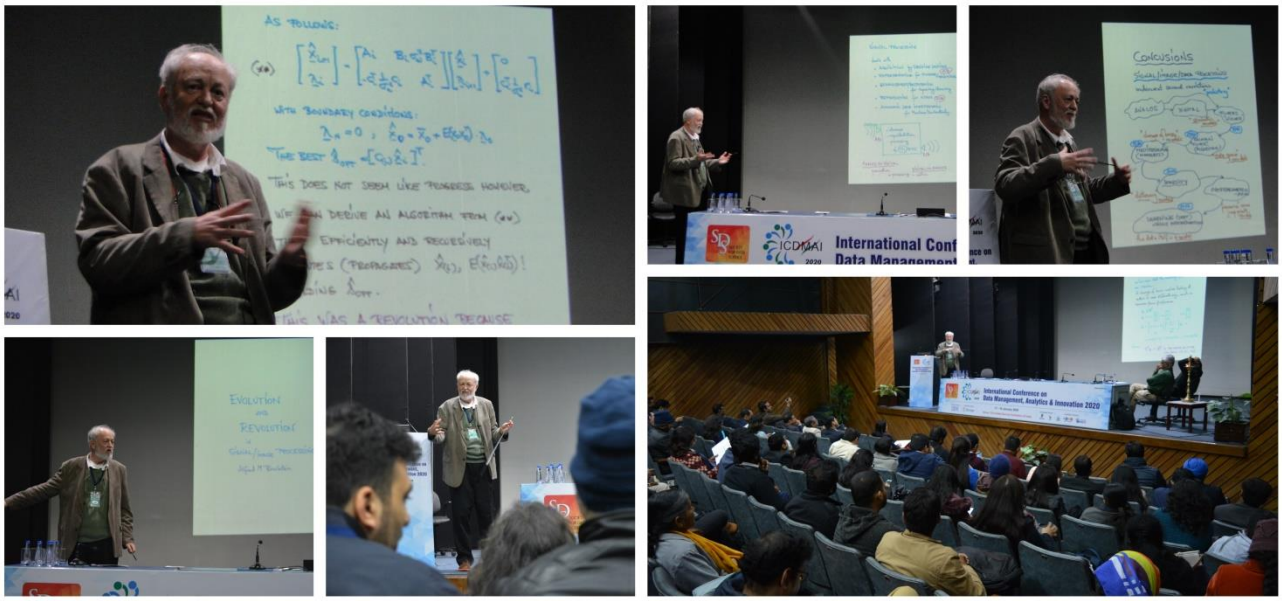
At the end, Prof. Amlan Chakrabarti, Vice-President, S4DS and Steering Committee Chair, ICDMAI 2020 thanked everybody who supported us to organize a conference of this magnitude. Amlan appealed to all the guests, partners and delegates for their continued support in future to help us create a data science ecosystem.

Vote of Thanks by Prof. Amlan Chakrabarti, Vice-President, S4DS and Steering Committee Chair, ICDMAI 2020

Glimpses of Guests and Delegates during the Inauguration Ceremony of ICDMAI 2020, which concluded with National Anthem

Inauguration ceremony was followed by the **First Session**, which had 02 Keynote Talks and 16 Paper Presentations. This session was chaired by **Dr. Amol Goje**, President, S4DS, who introduced both the Keynote Speakers - **Alfred M. Bruckstein**, Technion - Israel Institute of Technology, Faculty of Computer Science, Israel and **C. Mohan**, IBM Fellow, IBM Almaden Research Center in Silicon Valley.

Alfres's keynote talk was on topic "**From Sparsity to Over-Parameterization**". He spoke about evolution and revolution in the field of signal, image and data processing that has undergone several paradigm shifts over the years. Recently sparse signal representations became a leading contender in the race to derive better performances in de-noising, smoothing and prediction, as well as understanding the underlying structure of various types of recorded data. Alfred's talk surveyed some of these recent developments and maps some of our encounters with various challenges in the field and the solutions we found for these.



Keynote Address by Alfred M. Bruckstein, Technion - Israel Institute of Technology, Faculty of Computer Science, Israel

Mohan's keynote talk was on the topic "**State of Permissionless and Permissioned Blockchains: Myths and Reality**". He shared that the adoption and further adaptation of blockchains and smart contracts in the permissioned or private environments is considered to be useful and of practical consequence. Mohan covered the technical aspects of private blockchain systems and busted many myths associated with permissionless blockchains. He also compared traditional database technologies with blockchain systems' features and identified desirable future research topics.

Keynote Address by C. Mohan, IBM Fellow, IBM Almaden Research Center in Silicon Valley

Chief Guest, Keynote Speakers, Guests, Partners and Delegates at Inauguration Ceremony of ICDMAI 2020

After keynote address, the delegates dispersed for the paper presentation in four different tracks of 60 mins each. Total 16 papers were presented in session 01.

Glimpse of Paper Presentation by the delegates on 18 January 2020 at ICDMAI 2020

Post lunch, we started the **Second Session**, which had 02 Keynote talks, 01 Panel Discussion and 14 Paper Presentations. This session was chaired by **Prof. Amlan Chkrabarti**, Vice President, S4DS, who introduced the Keynote Speakers - **Mr. Dinanath Kholkar**, Vice President and Global Head of Analytics & Insights, Tata Consultancy Services and **Mr. Biswajit Patra,** Director Design, Intel, India.

The keynote talk by Dina was on very interesting and relevant topic "**Global Sustainability Ecosystem – Challenges and Opportunities**". He said there is a need for serious commitment to integrate environmental, social and ethical principles in our core businesses to enhance accountability. He shared

that many leading corporate houses already have sustainability as agenda and are involved in philanthropic activities like education, health, livelihood generation for the needy and protect the environment. Sustainability, currently driven by the UN Sustainable Development, is fast becoming a play for the corporates where material topics impacting the businesses are being looked at as strategic focus areas. Not just for the compliance and social (CSR) part of it, but also for the new opportunities it can unveil for operations optimization (to improve margins) and new product innovations (sustainable product lines adding to the topline) thereby bringing on innovative offerings and business models. Dina shared that TCS has been pursuing the theme of sustainability across industry verticals and creating an ecosystem of both internal and external contributors, which will eventually lead us to knowledge and innovation ecosystem capable of shaping up a sustainable future.

Keynote Address by Mr. Dinanath Kholkar, Vice President and Global Head of Analytics & Insights, Tata Consultancy Services

Biswajit's topic for the keynote talk was "**Low Power High Performance SOC design for next generation human companion devices**". He shared that today's embedded solutions are driving higher performance applications in smaller form factors, from sophisticated industrial control and automation applications that require complex processing algorithms to digital signage applications that require high-performance graphics processing. These applications often require low power consumption and support for open standards in order to provide the highest levels of design flexibility. To enable these applications, developers need embedded processing platforms that deliver advanced performance while helping to reduce time-to-market and development costs. He further shared that new highly integrated system-on-chip (SOC) processors are available that feature a high-performance x86 multicore processor, a discrete-class graphics processing unit (GPU), an I/O controller, and error-correction code (ECC) memory support for high reliability – all on a single die. With increased chip-level integration, developers can achieve new levels of processing efficiency, while retaining a low power design and a significant footprint reduction to reduce manufacturing costs and minimize design complexity. Finally, he described the benefits, technology, and target markets for single-chip SOCs so developers can make informed decisions about whether a particular type of solution is right for their next embedded design projects.

Keynote Address by Mr. Biswajit Patra, Director Design, Intel, India

After 02 power packed keynote talks, there was a **Panel Discussion** on "**Data Science for Immersive Societal Applications"**, moderated by Col Inderjit Barara, Executive Member, Society for Data Science and the panelist were Alfred Bruckstein, Dinanath Kholkar, C. Mohan, Kranti Athalye.

Glimpse of Panel Discussion on "Data Science for Immersive Societal Applications" on 18 January at ICDMAI 2020

Each of the panel members highlighted the various aspects of Data Science in supporting the society at large. The experts stressed the need of developing efficient data repositories through governmental as well corporate efforts capturing various sectors of societal activities like environment, health, education, agriculture, cultural heritage etc. It also emerged that efficient predictive and classification models to be developed using the data repository can lead to early detection and diagnosis of the various societal problems, which can lead to effective and appropriate action items.

After panel discussion, the delegates dispersed for the paper presentation in four different tracks of 60 mins each. Total 14 papers were presented in session 02.

Glimpse of Paper Presentation by the delegates on 18 January 2020 at ICDMAI 2020

In the evening, the brief **Tour** of Delhi city was organized for the guests, delegates and participants. We took them to two important sightseeing points ie. Lotus Temple and India Gate.

L→ R: Lotus Temple, Participants in the Bus, India Gate on 18 January 2020 at ICDMAI 2020

The **Lotus Temple** is a Bahá'í House of Worship that was dedicated in December 1986. Notable for its flowerlike shape, the Lotus Temple is open to all, regardless of religion or any other qualification. The next site was **India Gate** which is a war memorial to 70,000 soldiers of the British Indian Army who died in between 1914–1921 in the First World War and is designed by Sir Edwin Lutyens.

Random Clicks on 18 January 2020 at ICDMAI 2020

Day 03: 19 January 2020
(Keynote Address / Plenary Talk / Panel Discussion / Paper Presentations / Award Function)

Day 03 began with the arrival of the guests, delegates and participants at the conference venue since 8.00 AM for registration and breakfast. At 10:00 AM, everybody gathered at the auditorium to start the **Third Session** of the conference, which had 02 Keynote talks and 13 Paper Presentations. This session was chaired by **Dr. Neha Sharma**, Founder Secretary, S4DS, who introduced both the Keynote Speakers – **Mr. Aninda Bose**, Senior Editor – Hard Sciences, Springer India Pvt. Ltd. and **Prof. Anupam Basu,** Director at NIT, Durgapur

Aninda delivered a keynote on the topic "**Publishing Ethics and Author Services**". He explained that the importance of research publishing can be defined by a simple quote of Gerard Piel, which says "Without publication, science is dead." The first scientific journal was published in 1665 and we have travelled 350 years since then. In the last 20 years, science and reporting of science have undergone revolutionary changes. Computerization and Internet have changed the traditional ways of reading and writing. Hence, it is very important for scientists and students of the sciences in all disciplines to understand the complete process of writing and publishing of scientific paper in good journals. There is also a downside of digital publishing. The principal challenge for publishers is to handle ethical issues and it is of utmost importance for the authors to understand the ethical practices involved in the process. Aninda, in his talk provided information on different ethical practices and also on how to make use of various author services for the publishing work.

Keynote Address by Mr. Aninda Bose, Senior Editor – Hard Sciences, Springer India Pvt. Ltd.

Next keynote was by Prof. Anupam Basu on the topic "**AI: Illusion and Reality**". Sir highlighted that robotics was about embedding rules into technology to automate processes, while AI is about embedding analytics into the process through technology. In a hypothetical scenario where every process has AI in it, there would be no need for analytics outside of the process because all data would be analyzed at source and the actions based on that analysis already taken!

According to him, "Artificial Intelligence (AI) is an illusion, it doesn't exist and it never will. What exists is software code written by humans to exploit other humans". But he contradicted himself by saying that AI is a reality, not an illusion and it is revolutionizing the customer service industry to simplify humans' lives and improve companies' business results. As the world shifts gears from social media towards messaging apps, it's time to bring down the misconceptions of AI and chatbots and point out what great opportunity it is for businesses.

Keynote Address by Prof. Anupam Basu, Director at NIT, Durgapur

Followed by two diverse keynote talks, the delegates dispersed for the paper presentation in four different tracks of 60 mins each. Total 13 papers were presented in session 03.

Glimpse of Paper Presentation by the delegates on 19 January 2020 at ICDMAI 2020

The guests, delegates and participants again gathered at the auditorium to for the **Fourth Session** of the conference, which had 01 Keynote talk, 01 Plenary talk, Panel Discussion and 19 Paper Presentations. This session was chaired by **Dr. Saptarsi Goswami**, Executive Member, S4DS, who introduced the Keynote

Speaker – **Prof. Sangeet Saha**, Senior Research Officer, School of Computer Science and Electronic Engineering, University of Essex, UK and Plenary Speaker – **Mr. Umesh Mishra**, Regional Director, North India, Wizertech Informatics Private Limited.

Sangeet delivered a keynote on "**Insights into How Robots can perceive in Extreme Environments**". He covered various extreme environments and explained how robots will perceive those and perform effectively.

Keynote Address by Prof. Sangeet Saha, Senior Research Officer, University of Essex, UK

Moving ahead, there was a plenary talk by Mr. Umesh on a very current topic "**Data Analytics: A Game Changer**". The truth is, it is really a game-changer. At present, organizations operate millions of sensors as they stream endless data from manufacturing machines, pipelines, and all kinds of remote devices. This results in the accumulation of unmanageable data, 73% of which will never be used. The talk was very information and appreciated by all the participants.

Keynote Address by Mr. Umesh Mishra, Regional Director, North India, Wizertech Informatics Private Limited

After the keynote and plenary talks, there was a **Panel Discussion** on "**Reinventing Cyber security with Artificial Intelligence"**, moderated by Prof. Amlan Chakrabarti, Vice President, Society for Data Science and the panelist Anupam Basu, Biswajit Patra, Lipika Dey, P. K. Sinha, Kuldeep Singh.

The panel members discussed the various facets of security concern in modern IT infrastructures and the strategic use of AI based methods to handle those scenarios. The panellist emphasized the need of AI and Machine Learning techniques in developing adaptive security policies and threat mitigation strategies to cater the present need of various kind of systems ranging from tiny IoT devices to Distributed Cloud infrastructures. The entire panel also expressed the need of developing training programs for the training of IT manpower in this critical and complex domain.

Glimpse of Panel Discussion on "Reinventing Cyber security with Artificial Intelligence" on 19 January at ICDMAI 2020

After this interesting panel discussion, the delegates dispersed for the paper presentation in four different tracks of 60 mins each. Total 19 papers were presented in session 04.

Glimpse of Paper Presentation by the delegates on 19 January 2020 at ICDMAI 2020

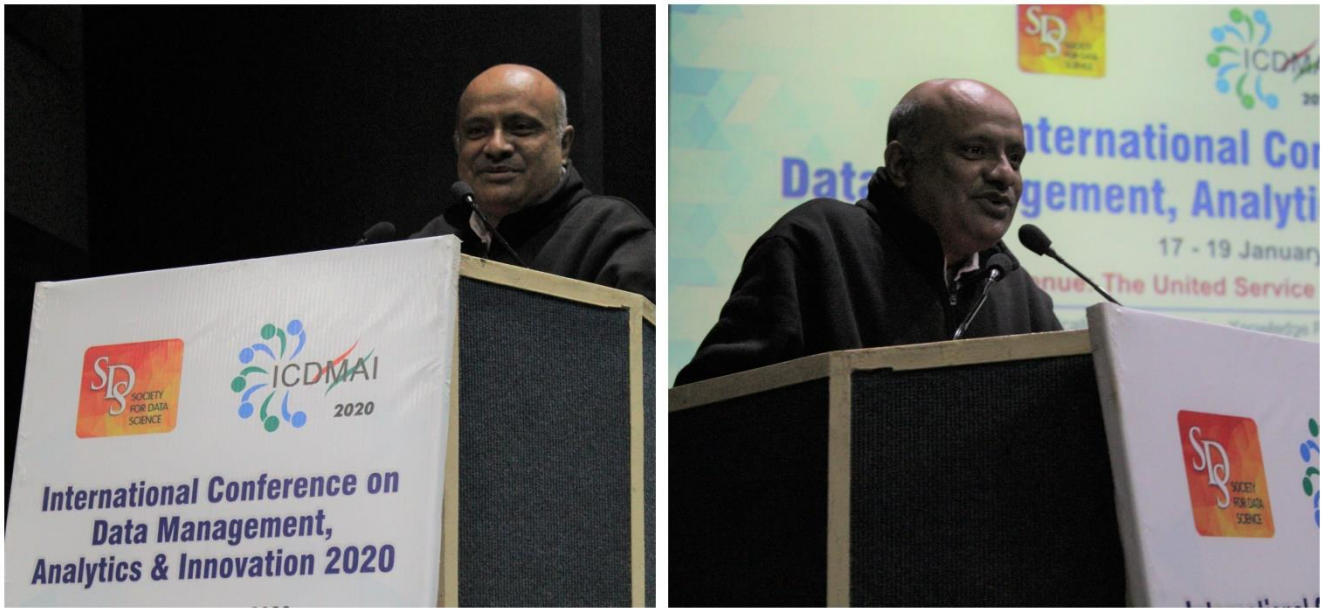
The guests and the delegates gathered in the auditorium for the final time after lunch for valedictory function and award ceremony. The valedictory function began at 15:00 hrs with the valedictory keynote by **Dr. Lipika Dey,** Principal Scientist, Innovation Labs, Tata Consultancy Services, New Delhi, India. The topic of the talk was "**Natural Language Processing – the game changer in AI Innovations**". She said that the widespread success of Artificial Intelligence based systems in recent times can be largely attributed to the fact that humans are now able to interact with computational systems very much the same way they interact with other humans. Voice-based interfaces, chatbots and question answering systems have ensured that sooner or later the larger populace irrespective of their native language, literacy levels or familiarity with computational devices will be able to reap the benefits of automation. The success of NLP has undoubtedly come due to the availability of large volumes of data, humongous computational resources that can process it along with deep learning paradigms. These success stories definitely hold good potential for a country like India that is characterized by its vastness, diversity and multi-linguality. Her talk gave a complete run-up to this journey and the way ahead.

Keynote Address by Dr. Lipika Dey, Principal Scientist, Innovation Labs, Tata Consultancy Services, New Delhi, India

Now, it was the time for much awaited event in every researchers life ie. **Award distribution**, as it gives the returns to the efforts put in by them throughout their research endeavor. It gives a sense of achievement and a sense of responsibility towards fulfilling further commitments towards research. Therefore, the Best Paper Awards were declared for each track and the winners were bestowed with a Trophy and Certificate.

Finally, Dr. Amol Goje, President, Society for Data Science, delivered a **Vote of Thanks.** Sir payed gratitude to all the session chairs for their un-tiring efforts in evaluating the papers and being unbiased in the selection of papers for awards. He also appreciated authors for their quality submissions and encouraged them to participate in ICDMAI 2021. Sir, also thanked all the partners and guests for their gracious presence and

profuse support. He further shared the plan for next year, the offerings of S4DS and the vision for data science community at national and global level.



Vote of Thanks by Dr. Amol Goje, President, Society for Data Science, India

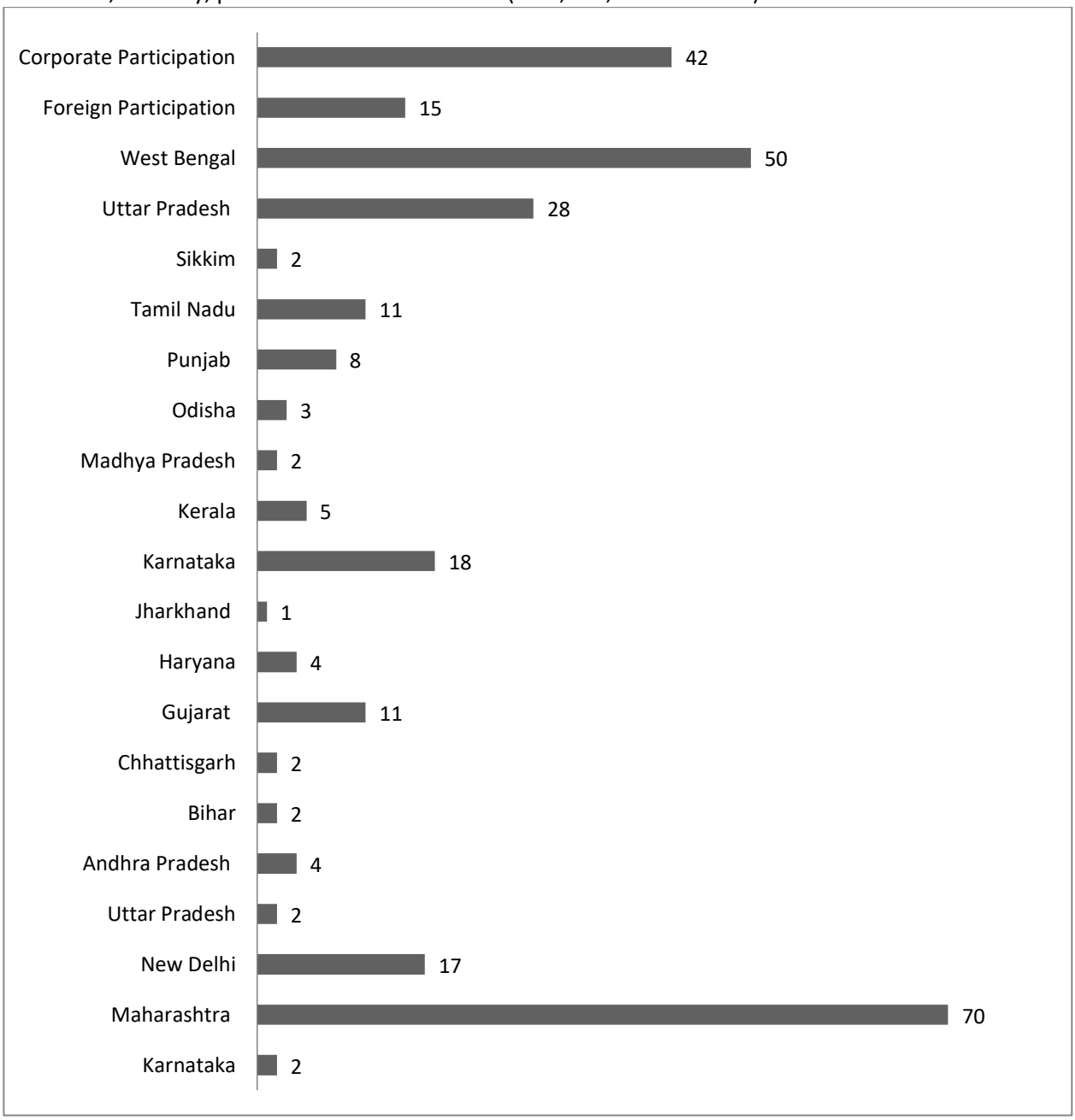
Aristotle quoted that "**Excellence is never an accident. It is always the result of high intention, sincere effort, and intelligent execution; it represents the wise choice of many alternatives - choice, not chance, determines your destiny**". As per the Technical Programme Committee of ICDMAI 2020, the efforts, innovation, intelligent execution presented by all the delegates were exemplary and an achievement in itself. At the end, Delegates were requested to collect their certificate from the registration desk and submit their feedback form. ICDMAI 2020 concluded with a promise to raise the standards further to create a new benchmark and officially bid adieu to everyone.

Glimpses of Guests, Delegates and Participants at ICDMAI 2020 on 19 January 2020

12. ICDMAI-2020 PAPER SUBMISSION METRICS

12-A. Response to the Conference

Soon after the **Call for Paper** was announced and information was uploaded on the conference website on 15th March 2019, the conference started receiving overwhelming response from all the states of our country as well as from international community. This response is evident from the fact that total **514 research papers** were submitted to the conference. The graph below shows the statistics of number of participants from abroad, industry, premier institutions of India (NITs, IITs, IIMs and IIITs) and Indian states:



12-B. Review Process

1) Solicited papers in four tracks through Call for paper
2) Conducted plagiarism check of the submitted paper in respective track using Turnitin Software.
3) Depending on the result, took appropriate action from the following options: -
    a. If Plagiarism > 50%, then Rejected the submission and informed the author
    b. If Plagiarism < 50 % and > 20%, then asked the author to improve the paper further
    c. If Plagiarism < 20 %, then informed the author regarding provisional acceptance for review
4) Assign each paper to the three appropriate Reviewers for Double Blind-review.
5) Pursue with the reviewers and encourage them to submit timely review report.
6) Shared the reviews with authors and ensured that the suggestions have been incorporated fully.

12-C. ICDMAI 2020 Metrics

514 Research papers have been submitted for ICDMAI 2020 and out of them only 62 papers ie. 12% papers are selected for oral presentation. The details of the paper selection and registration statistics are given below:-

Particulars	Information
Total paper received	514
Paper selected after double blind review	**62 (12%)**
Number of participants registered as listener	57
Total Delegates registered for ICDMAI 2020	**69**
Total papers presented at the conference	62
Absenteeism	00
Total attendance at ICDMAI 2020	126
Number of Indian States from where papers were received	21

Participation of Industries in ICDMAI 2020

Cognizant Technology Solutions India Pvt Ltd
Tata Consultancy Services
Aptus Data Labs
Reserve Bank of India
Fidelity Management and Research (FMR), India
Keysight Technologies, Kolkata
IBM
Nomura Research Institute Financial Technologies India Pvt Ltd
Technodata Analytics
IBS Software
Power System and Education Consultant, Pune
Must Research
Ericcson

Participation of Countries in ICDMAI 2020

Botswana
Germany
India
Israel
Japan
Malaysia
South Africa
United Kingdom
United States

Participation of International Universities in ICDMAI 2020

Iwate Prefectural University, Iwate, Japan
Lincoln University College, Malaysia
Universiti Teknologi, Petronas
University of Maryland School of Medicine, Baltimore City, Maryland, U.S
Botho University
University of South Africa

Participation of Indian Institutes / Universities in ICDMAI 2020

University of Calcutta
A.K. Choudhury School of Information Technology University of Calcutta, Kolkata, India
Ahmedabad University
Amity University Uttar Pradesh
Avinashilingam Institue for Home Science and Higher Education for Women University
Baba Farid College
Basaveshwar Engineering College Bagalko
Bharati Vidyapeeth's College of Engineering
Bhartiya Vidya Bhavan Institute Of Management Science, Kolkata
Biluru Gurubasava Mahaswamiji Institute of Technology
Defence Institute of Advanced Technology, Pune
Delhi Technological University, New Delhi
DSPM International Institute of Information Technology Naya Raipur, Chhatisgarh, India
Future Institue of Engineering and Management
G L Bajaj Institute of Technology & Management, Gr. Noida
Galgotias university
GLS University
Gujarat Vidyapith
International Institute of Information Technology, Dharwad
Indian Institute of Science Education and Research, Kolkata
Indian Institute of Technology, (BHU), Varanasi
Institute of Advanced Research, Gandhinagar, Gujrat
International Institute of Information Technology, Bhubaneswar
ITM Universe Vadodara
Jadavpur University
Jagan Institute of Management Science, Delhi
JSS Academy of Technical Education, Noida
KNIT Sultanpur, UP, India
Lal Bahadur Shastri Institute Of Management (LSBIM), Delhi
Lovely Professional University
Madras Christian College
Manav Rachna University, Faridabad, Haryana
Mangalore University

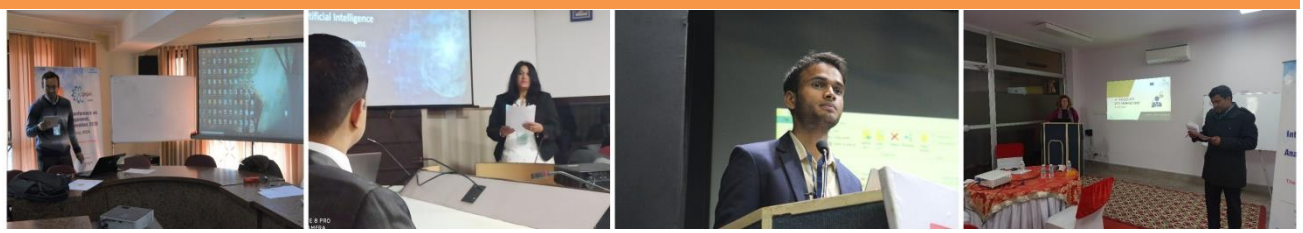
Manipal Academy of Higher Education
Medi-Caps University
Meghnad Saha Institute of Technology
MOP Vaishnav College for Women
National Institute of Electronics & Information Technology (NIELIT), Kolkata
National Institute of Electronics and Information Technology (NIELIT) Guwahati
National Institute of Technology Karnataka
National Institute of Technology Patna
Netaji Nagar Day College, Kolkata, India
Noida Institute of Engg & Technology Greater Noida
Pandit Deendayal Petroleum University
PES University
R N Shetty Polytechnic Belagavi
R.V. college of engineering
RAIT, Nerul Navi Mumbai
Royal Global University, Guwahati
School of Mobile Computing and Communication, Jadavpur University, Kolkata, India
Shri Ram Murti Smarak College of Engineering and Technology, Bareilly
SICSR, Pune, India.
Sikkim University
Sola, Ahemdabad
Surendranath College
Techno India University
Trinity College of Engineering and Research, Pune
University Institute of Technology, University of Burdwan
Usha Martin University
Vidyalankar Polytechnic
Vidylankar Institute of Technology
VISTAS, Vel's University Chennai
Vivekanand Education Society's Institute of technology(VESIT)
VIT

12-D. Paper Presentation Session Summary

Paper presentations were carried out in four sessions, and each session was further divided into four different tracks of 60 mins each.

Track 1: Data Management and Smart Informatics
Track 2: Big data Management
Track 3: Artificial Intelligence and Data Analytics
Track 4: Advances in Network Technologies

Session 01 and 02 happened on 18 January 2020, whereas Session 03 and 04 happened on 19 January 2020. Total 62 papers were presented in different tracks. Each track had a dedicated track coordinator and was chaired by an expert of the domain to evaluate the papers presented.



Session Coordinators for ICDMAI 2020: Mrityunjoy Pandey, Kreena Joshi, shafique khan, Chirag

The details of the Session Chairs and Session Coordinators for all the sessions of paper presentations in four parallel tracks on 18 - 19 January 2020 are shared below:

Venue -->				Seminar Hall No. 2	Seminar Hall No. 3	Auditorium	Seminar Hall No. 5
Date	Time	Min(s)	Session	**Track 1** (Data Management and Smart Informatics)	**Track 2** (Big Data Management)	**Track 3** (Artificial Intelligence and Data Analytics)	**Track 4** (Advances in Network Technologies)
				Session Coordinator	Session Coordinator	Session Coordinator	Session Coordinator
				Ms. Kreena Joshi	**Mritunjay Pandey**	**Shafique Khan**	**Loveleen**
				S4DS Session Chair	S4DS Session Chair	S4DS Session Chair	S4DS Session Chair
				Amlan Chakrabarti	**Amol C. Goje**	**Neha Sharma**	**Inderjit Barara**
18-Jan-20	12:00 - 13:00	60	**Session 1**	Session Chair: **Prof. Sugata Sen Roy**	Session Chair: **Prof. Surekha Deshmukh**	Session Chair: **Mr. Kaushik Dey**	Session Chair: **Prof.Manik Sharma**
	15:00 - 16:00	60	**Session 2**	Session Chair: **Prof. Biswajit Patra**	Session Chair: **Prof. Soumya Sen**	Session Chair: **Prof. Jayanta Yumnam**	Session Chair: **Prof. Alfred Bruckstein**
19-Jan-20	10:40 - 11:40	60	**Session 3**	Session Chair: **Prof. Biswajit Patra**	Session Chair: **Dr. Alfred Bruckstein**	Session Chair: **Prof. Narina Thakur**	Session Chair: **Prof. Soumya Sen**
	13.35 - 15:00	85	**Session 4**	Session Chair: **Prof. Manik Sharma**	Session Chair: **Prof. Jayanta Yumnam**	Session Chair: **Prof. Deepti Mehrotra**	Session Chair: **Prof. Saptarsi Goswami**

Glimpses of Session Chairs for ICDMAI 2020: Dr. Kaushik Dey, Prof. Alfred Brukstein, Dr. Jayanta Yumnan, Dr. Surekha Deshmukh, Dr. Manik Sharma, Dr.Narina Thakur , Dr. Soumya Sen

The evaluation parameters to evaluate the paper presentation were - Depth of Literature survey, Material Methods Used, Experimental Result, Conclusion Drawn and Relevance to the Industry/Society. Time allotted was 10 mins for presentation and 05 mins for Question & Answer. The details of the track wise paper presentations are given below:-

Track I: DATA MANAGEMENT & SMART INFORMATICS		
SESSION 1 - Day 2: 18 January 2020 Time: 12:00 – 13.00 (60 Mins)		
207	Rekha Gupta,Neha Budhiraja, Shreya Mago, Shivani Mathur	An IoT based parking framework for smart cities
214	Ajeet Phansalkar	Open Source Challenges & Opportunities
329	Neha Puri, Harjit Singh, Vikas Garg	Empirical study on the perception of accounting professionals towards awareness and adoption of IFRS in India
408	Prafulla Bafna, Jatinderkumar Saini	On Readability Metrics of Goal Statements of Universities and Brand-promoting Lexicons for Industries
SESSION 2 - Day 2: 18 January 2020 Time: 15:00 – 16.00 (60 Mins)		
435	Subhadeep Ghosh, Santanu Roy, Soumya Sen	An Efficient Recommendation System on E-Learning Platform by Query Lattice Optimization
446	Biky Chowhan, Partha Pratim Ray, Rashmi Mandal, Pawan Kuma Sharma	DengueCBC: Dengue EHR Transmission using Secure Consortium Blockchain Enabled Platform
454	Akshi Kumar, Kartik Anand, Simran Jha, Jayansh Gupta	Online Credit Card Fraud Analytics using Machine Learning Techniques
459	Prafulla Bafna, Jatinderkumar Saini	Identifying Major Critical Factors Faced by Tourism Industry Using Apriori Algorithm
SESSION 3 - Day 3: 19 January 2020 Time: 10:40 – 11.40 (60 Mins)		
507	Sayoni R., Aditya B., Saptarsi G.	Non-Parametric Distance – A new class separability measure
510	Preeti Ramdasi, Aniket Kolee, Neha Sharma	Digital Transformation of Information Resource Centre of an Enterprise using Analytical Services
511	Matthias Eck, Julian Germani, Neha Sharma, Jürgen Seitz, Preeti Ramdasi	Prediction of Stock Market Performance Based on Financial News Articles and their Classification

Track II: BIG DATA MANAGEMENT		
SESSION 1 - Day 2: 18 January 2020 Time: 12:00 – 13.00 (60 Mins)		
41	Ashis Kumar M., Mrityunjoy P., Aniruddha B., Saptarsi G., Amlan C., Basabi C.	An Approach of Feature Subset Selection using Simulated Quantum Annealing
68	Neepa Shah	A Novel Framework for Data Acquisitions and Retrieval Using Hierarchical Schema Over Structured Big Data
81	Anbazhagu Veerasamy, Anandan R	Predicting the cricket match outcome using ANFIS Classifier for viewers opinions on twitter Data
82	Rishil Kirtikar, Sanket Gokhale, Grishma Gurbani, Naman Varyomalani, Yogita B.	Extraction of tabular data from PDF to CSV files
SESSION 2 - Day 2: 18 January 2020 Time: 15:00 – 16.00 (60 Mins)		
204	Sunil Saumya, Jyoti Prakash Singh, Abhinav	Review rating inconsistency in E-commerce websites
222	Karthik Mn, Garima Makkar	Metadata Based NLIDB Approach
332	Wazib Ansar, Saptarsi Goswami, Amit Das	A Data Science Approach to Analysis of Tweets Based on Cyclone Fani
406	Shiladitya B., Divya Midhun C., Midhun C., Lukman Ab Rahim, Ade Wahyu Ramadhani	A GPU Unified Platform to Secure Big Data Transportation using an Error-Prone Elliptic Curve Cryptography

SESSION 3 - Day 3: 19 January 2020 Time: 10:40 – 11.40 (60 Mins)		
457	Ananya Banerjee, Kavya Sree Yella, Joy Mustafi	Automatic Standardization of Data based on Machine Learning and Natural Language Processing
506	Aditya Kumar B., Sourav M., Saptarsi G., Bhaswati G., Sugata Sen Roy, Amlan C.	Analysis of GHI forecasting using ARIMA

Track III: ARTIFICIAL INTELLIGENCE AND DATA ANALYTICS		
SESSION 1 - Day 2: 18 January 2020 Time: 12:00 – 13.00 (60 Mins)		
43	Reshu Parsuramka, Sourav Malakar, Sanjay Chakraborty, Saptarsi Goswami	An Empirical Analysis of Classifiers Using Ensemble Techniques
46	Pinaki Prasad Guha Neogi, Saptarsi G.	Force of Gravity oriented Classification Technique in Machine Learning
141	Prerna Agrawal, Bhushan Trivedi	Machine Learning Classifiers for Android Malware Detection
201	Shraddha Nimankar, Deepali Vora	Designing A Model To Handle Imbalance Data Classification Using SMOTE And Optimized Classifier
SESSION 2 - Day 2: 18 January 2020 Time: 15:00 – 16.00 (60 Mins)		
202	Susmita Ray	An Analysis of Computational Complexity and Accuracy of two Supervised Machine Learning Algorithms - K-Nearest Neighbor And Support Vector Machine
203	Deepti Gupta, Dr. Susmita Ray	A survey on application of machine learning algorithms in cancer prediction and prognosis
205	Chahat Bhatia	Augmented Reality Building Surveillance System
206	Prerna Mishra, Santosh Kumar, Mithilesh Kumar Chaube	Interpretation and Segmentation of Chart Images Using h-Means Image Clustering Algorithm
SESSION 3 - Day 3: 19 January 2020 Time: 10:40 – 11.40 (60 Mins)		
210	Sonam Sharma, Garima Makkar	Scoring Algorithm Identifying Anomalous Behavior in Enterprise Network
211	Akash Pandey, K.K. Shukla	Application of Bayesian Automated Hyperparameter Tuning on Classifiers Predicting Customer Retention in Banking Industry
334	Bikash Kumar Behera, Sabyasachi Mukhopadhyay, Prasanta K. Panigrahi	Quantum Machine Learning: A Review and Current Status
405	Abhinand Poosarala, Dr Jayashree R	Survey of transfer learning and a case study of emotion recognition using inductive approach
SESSION 4 - Day 3: 19 January 2020 Time: 13:30 – 15.00 (85 Mins)		
431	Payel Banerjee, Amlan Chakrabarti, Tapas Kumar Ballabh	An Efficient Algorithm for Complete Linkage Clustering with a Merging Threshold
432	Saurov Mahanta, Bhaskarjyoti Gogoi, Bhaben Tanti	Analytics for In Silico Development of Inhibitors from Neem (Azadirachta indica) against Pantothenate synthetase of Mycobacterium tuberculosis
436	Usha M, Iyyanar M	A Machine Learning Model for Forecasting Wind Disasters for Farmers
437	Arnab Santra, Aniket Mitra, Abhirup Sinha,Amit Kumar Das	Prediction of most valuable Bowlers of Indian Premier League (IPL)
438	Shubham Kumar, Anmol Gulati, Rachna Jain, Preeti Nagrath, Nitika Sharma	Categorizing Text Documents using Naãive Bayes, SVM and Logistic Regression

439	Naman Jain	Attribute Analysis for Data Validation and Performance Measure of a Classification Algorithm
441	Suvasree Biswal, T Amarnath, Prasanta Panigrahi, Nrusingh Biswal	Machine learning to diagnose common diseases based on symptoms
443	Deb Prakash Chatterjee, Sabyasachi M., Saptarsi Goswami, Prasanta Panigrahi	Efficacy of Oversampling over Machine Learning Algorithms in Case of Sentiment Analysis
445	Pawan Kumar Verma, Prateek Agrawal	Study and Detection of Fake News: P2C2 Based Machine Learning Approach
447	Sreeja Ashok, Amal Das N P, Kanu Aravind	Demand Forecasting Framework for Optimum Resource Planning
448	Saumen Ghosh, Himadri Bhattacharyya Chakrabarty, Moheeyoshee Moitra	Determination of Ozone Density Applying Artificial Intelligence
450	Surekha Deshmukh, Jayashri Satre, Dattatray Doke	Development of LSTM-Neural Network for Predicting Very Short Term Load of Smart Grid to participate in Demand Response Program
452	D V Rakesh Reddy, U Abhinand Varma, Prasanth Paraselli, Joy Mustafi	Answering Predictive Questions in Natural Language based on Given Data for Forecasting
455	Seema Nandal, Avadesh Kumar, Naresh Kumar	Detecting Duplicate Bi-lingual Mash-up Question pairs using Siamese Multi-layer Perceptron Network
456	Shalu Gupta, Y. Jayanta Singh	Glowing Window Based Feature Extraction Technique for Object Detection
458	Shruti Jadon	Improving Siamese Networks for One Shot Learning using Kernel Based Activation functions
468	Chintan Mehta, Mohit Nimgaonkar, Rohan Devasthale, Shreyas P., Deepak S.	Prediction of Mental Disorder Using Artificial Neural Networks and Psychometric Analysis.
503	Rajneesh Tiwari, Aritra Sen, Kaushik Dey	Design thinking for class imbalance problems using compound techniques
504	Abhirup Banerjee, Saptarsi Goswami, Amit Kumar Das	A Hybrid Graph Centrality Based Feature Selection Approach for Supervised Learning
509	Vinay Kumar	Review on Image Classification with Quantum Machine Learning
512	Sai Dhanuj Nukala, Vipul Mishra	Modeling Earthquake Damage Grade Level Prediction using Machine Learning and Deep Learning Techniques
513	Venkata Durga Kiran V, Sasumana Vinay Kumar, Suresh B Mudunuri, Gopala K M	Comparative Study of Machine Learning Models to Classify Gene Variants of ClinVar
514	Manish Bali, P V R Murthy	Bio-Molecular Event Extraction Using Classifier Ensemble-of-Ensemble Technique

Track IV: ADVANCES IN NETWORK TECHNOLOGIES		
SESSION 1 - Day 2: 18 January 2020 Time: 12:00 – 13.00 (60 Mins)		
208	Amlesh Mendhekar, Amishi Arora	Innovative Techniques for Student Engagement in Cybersecurity Education
219	Lavanya Suja T, Dr. Booba B	An Analytical study on importance of SLA for VM migration algorithm and Start-ups in Cloud
327	Mitra Tithi Dey, Punyasha C., Amlan C.	Smart Waste Monitoring using Internet of Things
331	Sakthi Kumaresh	Academic Blockchain: An application of Blockchain technology in Education

SESSION 2 - Day 2: 18 January 2020 Time: 15:00 – 16.00 (60 Mins)		
409	Kunal Pal, Suthikshn Kumar	QR Code based Smart Document Implementation using Blockchain and Digital Signature
434	Ramesh Chandra Goswami	Security Issue in Internet of Things

Track wise **Best Papers Awards** were announced during the valedictory function:-

Track 1: Data Management and Smart Informatics

1st Position: **Paper-id: 510, Preeti Ramdasi, Aniket Kolee, Neha Sharma**

2nd Position: Paper-id: 459, Prafulla Bafna, Jatinder kumar Saini

Winners of Track 1- Data Management and Smart Informatics

Track 2: Big Data Management

1st Position: Paper-id: 82, Rishil Kirtikar, Sanket Gokhale, Grishma Gurbani, Naman Varyomalani, Yogita Bhatia, Shefali Athavale

2nd Position: Paper-id: 332, Wazib Ansar, Saptarsi Goswami, Amit Das

Winners of Track 2 - Big Data Management

Track 3: Artificial Intelligence and Data Analytics

1st Position: Paper-id: 458, Shruti Jadon

2nd Position: Paper-id: 441, Suvasree Biswal, T Amarnath, Prasanta Panigrahi, Nrusingh Biswal

3rd Position: Paper-id: 221, Akash Pandey, K.K. Shukla

3rd Position: Paper-id: 431, Payel Banerjee, Amlan Chakrabarti, Tapas Kumar Ballabh

3rd Position: Paper-id: 447, Sreeja Ashok, Amal Das N P, Kanu Aravind

3rd Position: Paper-id: 514, Manish Bali, PVR Murthy

Winners of Track 3- Artificial Intelligence and Data Analytics

Track 4: Advances in Network Technologies

1st Position: Paper-id: 409, Kunal Pal, Suthikshn Kumar

2nd Position: Paper-id: 327, Mitra Tithi Dey, Punyasha Chatterjee, Amlan Chakrabarti

Winners of Track 4: Advances in Network Technologies

13. FEEDBACK

Obtaining feedback from the conference guests/delegates helps the organizer of the conference to strengthen the retrospection aspects to conduct similar kind of event in future. The feedback that we received from all the conference participants was overwhelming and the same has been compiled and depicted in below given table which was collected through the feedback form.

Feedback and Experience Sharing by the Delegates

Category	About conference theme, arrangements, guest speakers, etc.	Ideas / improvements for the next conference	Overall Remarks
Guests	Innovative ideas discussed, Topical theme, Excellent arrangements	Separate track for research scholars & students	Excellent Event Management, Cohesive Team
Paper Presenters	Very much contemporary Conference, Excellent keynote speakers, overall good arrangements	Inclusion of Panel Discussion, Keynote should adhere to the time assigned	Overall very good Experience

Takeaways from the International Conference

Students:

The students and research scholars got the exposure to various national and international guests and speakers. Some of the student volunteers also got the opportunity to have one-to-one (face-to-face) interaction with all the invited speakers of the conference.

Professionals from Academia and Corporate:

Professionals got the opportunity to exchange their knowledge, thoughts, innovations and research experiences in the broad field of Data Management, Analytics and Innovation on the common platform with the renowned experts from India and abroad. Thought provoking discussions and interactions with the keynote speakers of international repute and the delegates from different parts of the country, had already sown the seeds which will start sprouting in due course by way of academic and research collaborations, faculty exchange, invited talks, panel discussion events, etc. The research paper presented by the professionals will be soon published in the world's most read digital resource, SPRINGER.

Society for Data Science:

We have been striving to create a collaborative platform to promote Innovation around Data Science, for bringing together technical experts across Industry, Academia, Government Labs and Professional Bodies. The main focus is on strengthening the student community and enhancing the industry participation in S4DS activities across globe. We at S4DS are committed to take out at least some time to apply our skills and strengths in bringing positive difference in the community. The conference has further strengthened the overall brand image across globe. The society could successfully make a mark of its Excellence by holding this prestigious event.

Annexure A

Conference Brochure

ICDMAI 2020

17-19 January 2020

4th INTERNATIONAL CONFERENCE ON DATA MANAGEMENT, ANALYTICS AND INNOVATION

KEYNOTE SPEAKERS

Alfred M. Bruckstein
Technion - Israel Institute of Technology, Faculty of Computer Science, Israel

C. Mohan
IBM Fellow, IBM Almaden Research Center in Silicon Valley; Distinguished Visiting Professor, Tsinghua University, China

Klaus McDonald-Maier
Professor, School of Computer Science and Electronic Engineering (CSEE), University of Essex, U K

Dinanath Kholkar
Analytics & Insights unit of Tata Consultancy Services

Anupam Basu
Director, National Institute of Technology, Mahatma Gandhi Avenue, Durgapur, West Bengal, India

Lipika Dey
Principal Scientist, Innovation Labs, Tata Consultancy Services, New Delhi, India

Biswajit Patra
Director Design, Intel, India

Masood Parvania
Electrical and Computer Engineering, University of Utah, United States

Aninda Bose
Senior Publishing Editor, Springer India Pvt. Ltd.

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ICDMAI 2020

17-19 January 2020

4th INTERNATIONAL CONFERENCE ON DATA MANAGEMENT, ANALYTICS AND INNOVATION

TUTORIAL & WORKSHOPS - 17 JAN 2020

Kranti Athalye
Sr. Manager University Relations IBM
Artificial Intelligence and Cognitive Systems

Amol Dhondse
Senior Solution Architect, IBM
State of Art in AI world with Tranefer Learning

Kaushik Dey
Head of AI/ML and Big Data Practice, Ericsson
Algorithms at Edge Leveraging Decentralized Learning

Prof. Sugata Sen Roy
Head of the Department, Statistics
University of Calcutta
Time Series Modeling

Rangaraj
Deputy Director (Technical)
National Institute of Wind Energy
NWE's Wind Power Forecasting experience with Indian dataset

Mritunjoy Pandey
Senior Manager - Cognizant
Neural Network - Tuning

Dr. Mrinal Sarvagya
Professor, Rava University
Underwater communication and Networking

Amit Agarwal
Abzooba India Infotech Pvt. Ltd.

Ishant Wankhede
Abzooba India Infotech Pvt. Ltd.
A Recurrent Neural Pipeline for Multi-Class | Multi-Label Text Classification

Anindita Bandyopadhyay
Assistant Manager ICMC
Data Science in Medical Domain Case Study

C. Mohan
IBM Fellow, IBM Almaden Research Center
Artificial Intelligence (AI): Past, Present and Future

Kuldeep Singh
CDAC Delhi Chapter
Leverage Docker and Kubernetes for DS, ML and AI Workflow and Workload setup

M. Selva Balan
Scientist and head of Hydraulic Instrumentation division CWPRS
ML and DNN Based techniques for water resources and Flood

Rita Bruckstein
Director, Technion R&D Foundation Ltd.
European Commission procedures related to Data Management in their research funding schemes

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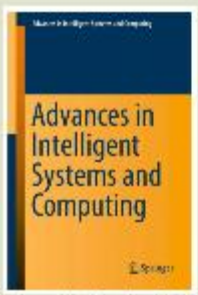

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Annexure B

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Vrinda Tokekar	Institute of Engineering & Technology (IET), Devi Ahilya University, Indore (M.P.)
Vijay Rao	Institute of System Studies and Analysis. Defence Research and Development Organisation Metcalfe House, Delhi
Yogesh H. Dandawate	Vishwakarma Institute of Information Technology, Pune