A Report on Two Days Workshop on
"Number Analytics and Data Science"
Organised by Department of Computer Science & Technology
in collaboration with the Indian Academy of Science
April 1, 2024 - April 2, 2024

Coordinator: Dr. S. Padma, Associate. Professor, Dept of CST

Co-coordinators: Dr. K. Dinesh, Asso. Prof, Dept of CST; Dr. B. Aravind, Asst. Prof, Dept of CST; Dr. Serin. V. Simpson, Asst. Prof, Dept of CST; Mr. D. Suresh, Asst. Prof, Dept of CST

Total Participants – 150 students
Mode of Conduct: Offline
Report received on 10.04.2024

The 2-Day Workshop titled "Number Analytics and Data Science," organized by the Department of Computer Science & Technology, MITS, in collaboration with the Indian Academy of Science at Madanapalle Institute of Technology & Science, Madanapalle, commenced with registration at 9:00 a.m. on April 1, 2024, in Auditorium. The Inauguration began at 9:30 a.m. with the lighting of the lamp by all dignitaries, followed by a welcome address by Dr. S. Padma, Associate Professor/CST, at 10:05 AM. This was succeeded by an address from Dr. M. Sreedevi, Head of the Department/CST, at 10:10 AM., and a keynote speech by Dr. Basabi Chakraborty, Dean of CST, at 10:15 AM. Dr. P Ramanathan, Vice Principal of MITS & Program Chair, then addressed the attendees at 10:20 AM. Dr. Padma S, who secured funding from the Indian Academy of Science, was also recognized. Dr. Serin Simpson, Assistant Professor/CST, introduced the resource person, Dr. S. Saravanan, Professor from Bharathiyar University, Coimbatore, at 10:30 AM., followed by Dr. Saravanan's address at 10:35 AM. Dr. K. Dinesh, Associate Professor/CST, introduced the Chief Guest & Convener, Dr. P. Kandasamy, Retired Professor from Bharathiyar University, Coimbatore, at 10:40 AM., who then delivered the inaugural address at 10:45 AM. The Chief Guest was felicitated at 10:55 AM., and the vote of thanks was given by Mr. V. Naveen, AP/CST, concluding the inaugural session at 11:00 AM.

Day 1: April 1, 2024

- **Technical Session 1 & 4:**
- **Resource Person: Dr. S. Saravanan FNASc., Professor, Dept of Mathematics Bharathiyar University, Coimbatore**
- **Topic: optimization techniques**

Dr. S. Saravanan, a distinguished professor from the Department of Mathematics at Bharathiyar University, Coimbatore, led the sessions focusing on "Optimization Techniques." Attendees gained insights into various optimization methods and strategies applicable in the realm of data science. Dr. Saravanan elaborated on classical optimization algorithms such as gradient descent, as well as modern approaches including genetic algorithms and simulated annealing. Through case studies and practical examples, participants understood how optimization techniques are applied to address real-world problems in data analysis, machine learning, and decision-making.

Figure 5: Resource Person: Dr.S.Saravanan FNASc., Professor, Dept of Mathematics Bharathiyar University, Coimbatore

- **Technical Session 2 & 3:**
- **Resource Person: Dr. Kannan Srinathan, Assistant Professor, Department of CSE, IIIT, Hyderabad**
- **Topic: Privacy Preserving Data Processing**

Dr. Kannan Srinathan, Assistant Professor at the Department of Computer Science and Engineering, IIIT Hyderabad, captivated the audience with his sessions on "Privacy Preserving Data Processing." His discussions revolved around techniques and methodologies ensuring privacy while processing sensitive data, a pertinent concern in today's data-driven world. Dr. Srinathan elucidated cryptographic protocols such as homomorphic encryption and secure multiparty computation, showcasing their applications in scenarios like collaborative data analysis and outsourcing computations while preserving privacy. Participants gained a deeper understanding of the trade-offs between privacy and utility in data processing, along with practical approaches to mitigate privacy risks.

Figure 6: Resource Person: Dr.Kannan Srinathan, Assistant Professor, Departement of CSE, IIIT, Hyderabad

Day 2: April 2, 2024

- **Technical Session 5 & 7:**
- **Resource Person: Dr. Nagaraju K, Assistant Professor (Grade-1), Department of CSE, Indian Institute of Information Technology Design and Manufacturing Kurnool, Kurnool-Andhra Pradesh.**
- **Topic: Time Series Analysis**

Dr. Nagaraju K, Assistant Professor (Grade-1) at the Department of Computer Science and Engineering, Indian Institute of Information Technology Design and Manufacturing Kurnool, Andhra Pradesh, led sessions on "Time Series Analysis." Participants delved into the intricacies of analyzing temporal data patterns, a crucial skill in forecasting and decision-making processes. Dr. Nagaraju discussed various time series models including ARIMA (AutoRegressive Integrated Moving Average) and Exponential Smoothing, highlighting their applications in forecasting future trends and identifying patterns in sequential data. Through hands-on exercises and case studies, attendees gained practical experience in time series analysis techniques and learned how to interpret and validate results effectively.

Figure 7: Resource Person: Dr. Nagaraju K, Assistant Professor (Grade-1), Department of CSE, Indian Institute of Information Technology Design and Manufacturing Kurnool, Kurnool-Andhra Pradesh.

- **Technical Session 6:**
- **Resource Person: Dr. S. Padma, Associate Professor, Dept of CST, MITS, Madanapalle, Andhra Pradesh**
- **Topic: Numeric Data Visualization**

Dr. S. Padma, Associate Professor at the Department of Computer Science & Technology, MITS, Madanapalle, Andhra Pradesh, enriched the audience with her session on "Numeric Data Visualization." Through illustrative examples and practical demonstrations, attendees gained insights into techniques for effectively visualizing numeric data, facilitating better understanding and interpretation. Dr. Padma covered a range of visualization methods including scatter plots, histograms, and heatmaps, emphasizing principles of effective visualization design such as scalability, interpretability, and aesthetics. Participants learned how to select appropriate visualization techniques based on data characteristics and analytical goals, enhancing their ability to communicate insights effectively to diverse stakeholders.

Figure 8: Resource Person: Dr.S.Padma, Associate Professor, Dept of CST, MITS, Madanapalle, Andhra Pradesh

- **Technical Session 8:**
- **Resource Person: Dr. P. Kandasamy, FNASc., Retired Professor, Dept of Mathematics, Bharathiar University, Coimbatore**
- **Topic: Numeric Data Analytics**

Dr. P. Kandasamy, a retired professor from the Department of Mathematics at Bharathiyar University, Coimbatore, concluded the workshop with his session on "Numeric Data Analytics." Drawing upon his extensive expertise, Dr. Kandasamy elucidated advanced analytics methodologies tailored for numeric datasets, equipping participants with valuable tools for deriving actionable insights from data. Dr. Kandasamy discussed statistical techniques such as regression analysis, hypothesis testing, and correlation analysis, showcasing their applications in uncovering relationships and patterns in numeric data. Through case studies and practical examples, attendees learned how to apply statistical methods effectively to address business challenges, validate hypotheses, and make data-driven decisions.

Figure 9: Resource Person: Dr. P. Kandasamy,FNASc., Retired Professor, Dept of Mathematics, Bharathiar University, Coimbatore

Valedictory Ceremony

Mr. Naveen, Assistant Professor, Dept. of Computer Science & Technology, MITS anchored the valedictory ceremony. Dr. Padma S (Coordinator), who secured funding from the Indian Academy of Science, summarized the workshop. The Principal, MITS, graced the valedictory ceremony. Dr. C. Yuvaraj, Principal congratulated all the participants on their completion of Workshop. Dr. M Sreedevi, Head of the Department/CST, thanked Indian Academy of Science, MITS Management and Principals & Managements of external participants for sending them to attend the 2 Day Workshop. Later, we took feedback from the participants to get suggestions and improvements for the future events. Dr. K. Dinesh, Co-Coordinator proposed the vote of thanks.

Figure 10: Valedictory of the Workshop

Outcome of the FDP, participants will be able to:

- Enhanced Understanding: Participants gained a deeper understanding of key concepts and methodologies in number analytics and data science, including optimization techniques, privacy-preserving data processing, time series analysis, numeric data visualization, and numeric data analytics.
- Practical Skills: Through case studies, and practical demonstrations, attendees acquired practical skills essential for applying various techniques in real-world scenarios. They learned how to analyze data effectively, derive actionable insights, and make informed decisions.
- Application Knowledge: Participants gained insights into the application of different techniques and methodologies discussed during the workshop. They learned how to apply optimization techniques to solve complex problems, preserve privacy while processing sensitive data, analyze temporal data patterns for forecasting, visualize numeric data for better interpretation, and perform numeric data analytics to derive meaningful insights.
- Collaboration and Networking: The workshop provided a platform for participants to network with peers, experts, and industry professionals. Through interactions and discussions, attendees had the opportunity to collaborate, share ideas, and explore potential collaborations for future research or projects.
- Empowerment: The workshop empowered participants with the knowledge, skills, and confidence to tackle contemporary challenges in the field of number analytics and data science. They gained valuable insights that can contribute to their professional growth and enhance their capabilities in their respective domains.