



SRI SATHYA SAI INSTITUTE OF HIGHER LEARNING
(Deemed to be University)

Dept. of Mathematics & Computer Science
Muddenahalli Campus

Innovate 360

Unveiling the power of data science, computing and beyond at Muddenahalli Campus: A Brief Report

The Muddenahalli Campus hosted the transformative event, "Innovate 360 - Unveiling the Power of Data Science, Computing, and Beyond," from February 12 to 16. This week-long convergence brought together intellects, ideas, and cutting-edge technologies, showcasing the dynamic landscape of data science and computing. The event not only assembled experts but symbolized a collective effort to unravel the potential at the intersection of technology and human ingenuity. "Innovate 360" pushed the boundaries of what was deemed achievable, promising a journey into new realms of possibility.

Inaugural Session:



The inaugural session commenced with a ceremonial invocation of Vedam chanting, accompanied by the lighting of the ceremonial lamp by the Vice Chancellor, Prof. B Raghavendra Prasad, and the Campus Director, Sri B Venkata Ramana. Following this, Prof. Pallav Kumar Baruah, Dean of Sciences, and Associate Head P. Sunil Kumar delivered the inaugural address, setting the tone for the event. The proceedings culminated with a keynote address by the Institute's Vice Chancellor, Prof. B. Raghavendra Prasad, providing valuable insights and perspectives for the gathering.

DAY - 1



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The first day of the workshop started with our Alumni Sri Vigneshwaran who delved deep into the topic “Behind the Meme Scene: The Role of Artificial Intelligence in Shaping Social Media Discourse”. He initially touched upon all the aspects needed to train a machine learning model and what are the metrics usually employed to evaluate the model. Subsequently, he went on to elaborate on how the Internet has become alarmingly toxic nowadays and how AI is helping mitigate this toxicity by going through the various case studies that he has worked on. His comprehensive exploration of AI's role in navigating social media discourse gave us valuable insights.

While technical skills such as programming and statistical analysis are crucial, an understanding of the specific industry or field in which data science is applied enhances the effectiveness of solutions. And this is what the second speaker of the day, Sri Surya Lamichaney heavily deliberated upon. Domain knowledge helps data scientists interpret results in a meaningful context, identify relevant variables, and design models that align with the unique challenges and nuances of the domain. The sum and substance of this session is that ultimately, the synergy between technical expertise and domain knowledge is key to generating actionable insights and impactful outcomes in data science applications.



The culminating session of the day, dedicated to full-stack development, cultivated a collaborative learning environment, encouraging active participation in hands-on exercises and real-world case studies. Led by industry experts Sri Ashik Rai and Sri Gime Lepcha, the interactive discussion not only heightened theoretical understanding but also bestowed crucial practical insights, showcasing the real-world implications of full-stack development. Participants left the session equipped with a comprehensive skill set and a deeper appreciation for the integration of theoretical concepts into practical industry applications.

DAY - 2



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The morning session of the 2nd day of the workshop commenced with Sri Ajay Mukund enlightening us about the intricateness of transformers and Large language models. Firstly, he meticulously unpacked the fundamental concepts of AI, machine learning, and deep learning, whereby he didn't only bring out the commonalities but also the nuanced distinctions between them. Furthermore, he explained the limitations of recurrent neural networks and how transformers have helped in addressing those shortcomings. Finally, he extensively discussed each component of a transformer and how each of them operates.

Sri Arunraj Gopalsamy led the afternoon session, emphasizing the transformative influence of IoT on everyday objects, turning them into intelligent entities capable of data collection and exchange. He delved into diverse IoT applications, highlighting their impact across sectors, from healthcare to smart cities. The speaker underscored IoT's potential to enhance daily life through smart homes, wearables, and connected vehicles. However, he acknowledged challenges such as security and data privacy that must be addressed to ensure the sustainable and beneficial impact of IoT on society. In summary, Mr. Gopalsamy provided a comprehensive overview, leaving the audience with a profound understanding of IoT's current state and future potential.





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The third day of the workshop was dedicated entirely to the exploration of the Geographic Information System (GIS), skillfully facilitated by Sri Anand Ranganathan. Ranganathan meticulously unfolded the multifaceted nature of GIS, encapsulating Software, Hardware, People, Data, and Analysis – effectively portraying it as the confluence of Science, Management, and IT. Through the use of insightful slides and captivating videos, he adeptly guided participants through the intricacies and nuances of GIS, starting with the intriguing inquiry into whether Google Maps falls under the GIS umbrella. The session progressed to reveal the widespread applications of GIS across diverse domains, including Climate, Environment, Transport, Defense, Health, and Business. Ranganathan's presentation not only clarified the technical aspects but also emphasized the interdisciplinary nature of GIS. Participants emerged with a profound understanding that GIS is not confined to a singular domain but represents a vast and dynamic field of study. In conclusion, the workshop underscored GIS as an opportunity-rich domain, welcoming individuals from both technological and business backgrounds to engage and contribute meaningfully to its advancements.

Sri Ranganathan's elucidation underscored GIS as an interdisciplinary domain, where individuals from both technical and business backgrounds find opportunities for meaningful engagement.

The session provided a nuanced perspective, emphasizing that GIS is not just a technological tool but a versatile field offering diverse opportunities for those in the technology or business domains. In conclusion, participants gained a profound appreciation for the expansive nature of GIS and its potential for collaborative exploration and innovation.

This workshop not only served as a technological exploration but also highlighted GIS as a versatile field, fostering collaborative engagement and innovation.



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Day 4 of the workshop was initiated with a thought-provoking presentation by Sri Samik, titled "LLM and Vector Databases for large Scale Document Curation". This session provided participants with profound insights into the strategic considerations guiding the integration of language models (LMs) and the deployment of vector databases on a large scale. Attendees acquired a holistic comprehension of language models, discerning their fundamental underpinnings and the distinct advantages they present in comparison to extensive language models. Moreover, the presentation intricately explored the concept of embeddings, shedding light on their pragmatic applications in real-world scenarios.

After the insightful presentation by Sri Samik, Sri Subhankar took the stage to deliver a comprehensive lecture titled "Behind the Cloud." In this session, attendees were immersed in a profound exploration of the foundational concepts underpinning cloud computing and virtualization. The session unfolded with a meticulous elucidation of the intricate workings of cloud computing, providing participants with a nuanced understanding of its core principles. Throughout the lecture, participants were introduced to the multifaceted realm of virtualization, encompassing various types such as computation, network, and storage virtualization.



The afternoon segment of Day 4 commenced with a captivating presentation by Sri Pranav Srinivas Dutta on "Uninformed and Informed Graph Traversal Strategies". This session delved into crucial graph traversal aspects, encompassing uninformed and informed search algorithms. Attendees were actively guided through a hands-on exercise, wherein the practical implementation of Google Maps was explored, highlighting algorithms such as A* search and Bidirectional A* search. The immersive session provided participants with a practical understanding of graph traversal methodologies, emphasizing the significance of informed search techniques in real-world applications.

DAY - 5



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The fifth day of the workshop commenced with a compelling presentation on "Spark Optimization" led by esteemed alumni, Sri Jyotin Padhi and Sri Venkat Kilaru. Attendees were immersed in an illuminating exploration that featured a thorough comparison between Hadoop MapReduce and Apache Spark. The session unfolded with an in-depth examination of MapReduce algorithms, providing attendees with valuable insights into the intricacies of data processing methodologies. Furthermore, the presentation extended its focus to elucidate Spark's extensive services and its capabilities in handling data. Participants were taken through key considerations, including Spark serializability, distinctions between Spark session and Spark context, and the optimization of Spark queries.

In the afternoon session of Day 5, participants were treated to an insightful talk by Sri Sathya Sai Mudigonda, accompanied by Dr. Rohan Yashraj Gupta and Sri. Naga Teja, on the subject of actuarial science. With a focus on the promising prospects of this field, the presentation provided attendees with valuable insights into the intricate domain of actuarial science. Sri Sathya Sai Mudigonda elucidated the evolving landscape of the discipline and its pivotal role in shaping financial strategies. The talk also delved into the significance of interpretable machine learning, offering a comprehensive understanding of its relevance in contemporary contexts. Additionally, some students from the II MSc program enriched the session by presenting their research papers, adding a valuable academic dimension to the afternoon's discussions.





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Valedictory Session:



During the valedictory session, Sri S.V.S Sarma encapsulated the essence of the 5-day workshop, commending the diverse range of topics covered, including data analysis and machine learning. His remarks underscored the transformative impact of the workshop, equipping participants not only with technical skills but also fostering a deeper understanding of the intricate intersections between data science, computing, and beyond. The session marked the successful conclusion of an enriching workshop. B Chiruhas, a student from I MSc Data Science and Computing, and Adithya Bharadwaj from II MSc shared insights about their learnings and experiences in the program, adding a valuable student perspective to the valedictory session.



The session concluded with the Mangala Arathi, symbolizing a heartfelt expression of reverence to our revered Bhagavan. As we extended our prayers, we sought his benevolent blessings for all participants, wishing for strength and guidance to undertake and organize future workshops successfully.

Photo Gallery:



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Vice Chancellor

Prof. Pallav Kumar Baruah
Professor & Dean of Sciences

Sri B Venkatramana
Associate Professor & Director, MDH



Sri P Sunil Kumar
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Sri. Naga Teja
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Student
II MSc in Data Science & Computing



Student
I MSc in Data Science & Computing



Students
II MSc in Data Science & Computing