MVJ COLLEGE OF ENGINEERING
Since 1982
Engineering A Better Tomorrow

An Autonomous Institute

Affiliated to Visvesvaraya Technological University, BelagaviApproved By AICTE, New Delhi.
Recognized by UGC with 2(f) & 12(B) status
Accredited by NBA and NAAC.

A Report on Guest lecture on "Information Retrieval (IR)"

Date of the event	15.03.2025
Title of the Event	**Guest lecture on "Information Retrieval (IR)"**
Organized by	Dept of Computer Science and Engineering MVJCE, Bangalore

BUILDING INFORMATION RETRIEVAL SYSTEM FOR INDIC LANGUAGES guest lecture was conducted by the **Department of Computer Science and Engineering** for 4th and 6th semester Computer science students, on 15 March 2025, at **Dr. M V Jayaraman Auditorium.** The Event was presided over by Dr. Kiran Babu T S (HOD/CSE). The guest lecture by Dr. Rudra Murthy, Staff Research Scientist at IBM, provided a high-level perspective on information retrieval for Indic languages. The session highlighted its role in simulating real-world scenarios, along with the key challenges encountered and the opportunities in the respective field.

About the speaker:

Dr. Rudra Murty completed his **PhD in Natural Language Processing** at **the Indian Institute of Technology, Bombay**, under Professor Pushpak Bhattacharyya, and holds a Master's degree in Data Mining from the Indian Institute of Science, Bengaluru. With over five years of experience at **IBM** as a **Research Scientist** and Intern, he focuses on Multilingual Natural Language Processing. His work aims to enhance NLP tasks for low-resource languages, particularly Indic languages, by leveraging deep multilingual learning techniques to improve model performance using features from high-resource languages.

A brief overview of the session:

The event began with a soulful invocation song performed by Ms. Khanak, Ms. Manogna G, and Ms. Vibha, setting a positive tone for the gathering. Mr. Rudra Murty was warmly invited onto the stage, receiving enthusiastic applause from the audience, which reflected their excitement for his presence. As a gesture of appreciation, Dr. Kiran Babu presented him with

a beautiful bouquet, symbolizing a warm welcome. Mr. Murty was then formally introduced to the gathering, highlighting his credentials and contributions to the field. The welcome address extended greetings to all attendees, including students and faculty members of the Computer Science and Engineering department, fostering a sense of community and engagement.

Fig.1 CSE HOD, Dr. Kiran Babu TS, presenting a token of gratitude.

The session was held from **10:00 a.m. to 12:30 p.m.**, with Mr. Rudra Murty taking the stage for one hour. During this time, he delivered an insightful lecture on the significance of Information Retrieval (IR) systems for Indic languages. He emphasized how these systems are crucial for effectively accessing and retrieving information in languages such as Hindi, Bengali, and Tamil, which often face challenges due to limited resources and data. Mr. Murty discussed the unique linguistic features of Indic languages and how they impact the design and implementation of IR systems. He highlighted the importance of developing tailored algorithms and models that can understand the nuances of these languages, thereby improving search accuracy and relevance. Additionally, he explored the integration of advanced techniques, such as natural language processing, to enhance the performance of IR systems in multilingual contexts, ultimately aiming to bridge the digital divide and make information more accessible to speakers of Indic languages.

Fig.2 Host of the event.

Key Highlights from Mr. Murthy's Session on Information Retrieval (IR) Systems

1. **Focus on Indic Languages:**
    - Emphasized the unique challenges and opportunities in developing IR systems for languages like Hindi, Bengali, and others.
2. **Integration with AI Models:**
    - Explained the concept of Retrieval-Augmented Generation (RAG) and how it combines traditional IR with advanced AI models.
3. **Live Demonstration:**
    - Showcased a legal document retrieval system based on the Bharatiya Nyay Sanhita (BNS).
4. **IR Pipeline Breakdown:**
    - Detailed the essential components of the IR pipeline:
        - Crawling: The process of gathering data from various sources.
        - Indexing: Organizing the collected data to facilitate quick retrieval.
        - Query Processing: Understanding and interpreting user queries to fetch relevant results.
        - Ranking Algorithms: Explained algorithms like PageRank and BM25 that determine the relevance of documents in response to a query.

- Discussed how each component contributes to the overall efficiency and effectiveness of an IR system.

5. Clarification of Complex Concepts:

- Used simple yet effective analogies to explain complex concepts such as:
    - Precision vs. Recall: Clarified the difference between retrieving relevant results (precision) and capturing all relevant results (recall).
    - Provided examples to illustrate how search engines balance these two metrics to optimize user satisfaction.

The session concluded with an engaging interactive Q&A segment, during which students explored the future of AI-powered search, the application of natural language processing (NLP) for Indic languages, and the development of efficient information retrieval (IR) models. This discussion provided valuable insights into the evolving landscape of technology and its potential to enhance accessibility and effectiveness in information retrieval for diverse linguistic communities.

The event successfully combined theoretical learning with practical application, offering students a comprehensive understanding of Information Retrieval and its significance in modern AI systems. The Department of Computer Science and Engineering expresses its gratitude to Mr. Rudra Murthy for his enlightening session. With enthusiastic participation and an intellectually stimulating atmosphere, the event served as a valuable stepping stone for students to explore the evolving landscape of AI-powered search and retrieval systems in greater depth.

Fig.3 Speaker delivering insights.

Fig.4 Students attending the guest lecture.

Outcomes of the Event on Information Retrieval and AI-Powered Systems

1. Enhanced Understanding of Information Retrieval:

- Students gained a comprehensive understanding of the principles and practices of Information Retrieval (IR), particularly in the context of Indic languages.

2. Awareness of AI Integration:

- Participants learned about the integration of AI technologies into IR systems, including how AI can enhance search accuracy and efficiency.

3. Insights into NLP for Indic Languages:

- The session highlighted the unique challenges and opportunities in developing natural language processing (NLP) solutions for Indic languages, fostering interest in this area of research.

4. Practical Applications:

- Students were exposed to real-world applications of IR systems, particularly in legal and defense contexts, demonstrating the relevance of their studies to industry needs.

5. Interactive Learning Experience:

- The interactive Q&A session encouraged critical thinking and engagement, allowing students to ask questions and discuss future trends in AI and IR.

6. Networking Opportunities:

- The event provided a platform for students to connect with industry professionals and peers, fostering collaboration and knowledge sharing.

7. Foundation for Future Learning:

- The insights gained from the session laid a strong foundation for students to delve deeper into advanced topics in AI, machine learning, and information retrieval in their future studies.

Bhuvaneshwari. G

Co-Ordinator of the Event

Assistant Professor

Computer Science and Engineering