Artificial Intelligence and Data Science

By: Department of Computer Science

Recently, on 6th November, 2023, Department of Computer Science arranged an expert lecture on Artificial intelligence and Data Science by Dr. T.V Vijay Kumar, Professor & Dean of School of Computer Science, JNU.

The event started with the welcoming and introduction of the professor which was done by Dr. Jyoti Pareek, Head of Department of Computer Science. Further, the event was followed by the discussion on various topics which was done by the professor. The topics were:

1. Introduction: Artificial intelligence and data science have become integral parts of modern technology, influencing various aspects of our lives, industries and society. Artificial intelligence includes the development of intelligent systems that can perform tasks more efficiently and effectively than humans. While, data science focuses on extracting knowledge from the data.
2. Bottom-up approach: This approach is basically related to machine learning. The system is provided with the data and it uses that information to predict and make decisions for future. This can work quite well for many tasks. It works by starting with an individual component and building up into the larger system. It is characterized by breaking down a large problem into a small task.
3. FDBMS Architecture: Federated Database Management System (FDBMS) architecture is a type of distributed management system which allows users to access and manipulate the data which is stored in multiple databases. These systems are a hybrid between distributed and centralized systems. It works by creating a virtual database that integrates data from multiple autonomous databases.
4. Ontology: It is a set of concepts and categories in a domain which shows the properties and relation between them. This serves as the backbone of AI systems by providing a shared domain for humans and machines. It

provides the map that links data and its meaning together by defining what is meaningful.

5. Semantical vs Syntactical Error: Semantical errors refers to the logical errors that produces the wrong output. Whereas, the syntactical errors refers to the errors in the syntax of the source code.
6. Data Warehouse: It is a type of data management system which is designed to enable and support business intelligence activities, especially analytics. These are commonly used for combining data from one or more sources, reducing load on operational systems, tracking historical changes in data and providing a single source.
7. Big Data: The term refers to the massive, complex and high velocity datasets. It is the fuel which powers the evolution of AI's decision making. It can be explored and analyzed for information and insights. It helps in making decisions faster, better and data-driven which increases efficiency, revenue and profits.
8. Data- raw fact: It is the collection of information that is gathered by the source before it has been processed or analyzed. It is the primary data. Once the data is changed in any way to improve its quality, the data has been processed, and is no longer considered as the raw data.
9. Information- processed data: It is the collection and manipulation of raw data to produce meaningful information. There are several steps to convert raw data into processed data which includes data cleansing, integration, alteration and reduction. Each and every step is important to make sure that the data is accurate, consistent and representative.
10. Knowledge: Machines performs all the actions through knowledge representation and reasoning. It is responsible for representing the information, so that the computer can understand and utilize the knowledge to solve the complex problems.
11. Wisdom: It is a software system which demonstrates the qualities of being wise. It can be described as the top-level of decision-making when the system is dealing with the most complex and challenging situations.
12. Selection vs Extraction: All AI models requires some features that are relevant and important to predict the outcome. And two of those features are selection and extraction. Selection feature helps in selecting

a subset of relevant features from the original set of features. It is categorized into three methods namely: Filter method, Wrapper method and Embedded method. Whereas, Extraction feature helps in transforming the original features into a new set of features that are more informative. It is categorized into two methods namely: Linear method and Non-linear method.

The lecture was very interesting and interactive. The department was very grateful to have this lecture. The event was ended with the vote of thanks which was done by Dr. Maitri Jhaveri, professor of Department of Computer Science.


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