A Report on Guest Lecture
"Introduction and Real-World Applications of Machine Learning"
Organized by **Department of Computer Science & Engineering**
in association with **Computer Society of India (CSI)**
On 06.05.2024

Resource Person Details: Dr. U. Srinivasulu Reddy, Associate Professor, Department of Computer Applications, National Institute of Technology, Trichy
Report Submitted by: Mrs. M. Bommy, Asst. Professor, Department of CSE
Report Received on 10.05.2024
Mode of Conduct: Online
Attendance: 77 participants (Internal)
Venue: Seminar Hall A

The Department of Computer Science & Engineering in association with CSI, organized a guest lecture on the topic **"Introduction and Real-World Applications of Machine Learning"** for the CSE students on 06/05/2024 from 11.00 Am to 12.30 Am in Seminar Hall A.

Dr. U. Srinivasulu Reddy, Associate Professor, Department of Computer Applications, National Institute of Technology, Trichy was the resource person for the programme.
The welcome address was given by **Mrs. M. Bommy**, Assistant Professor, Department of CSE to the gatherings.

Dr. R. Kalpana, Professor & Head, Department of CSE shared the importance of learning about Machine Learning and importance of organizing this guest lecture on the topic "Introduction and Real-World Applications of Machine Learning".

The Resource person started the session by extending her hearty thanks to the participants, organizing members, HoD, Principal and Management of MITS Madanapalle for giving him the opportunity to share his knowledge and experience. The resource person shared his amazing ideas on Machine Learning.

Highlighted topics in the guest lecture are as follows:

1. Introduction to Machine Learning:
- Definition: Machine Learning is a subset of artificial intelligence (AI) that focuses on the development of algorithms and statistical models that enable computers to learn and improve from experience without being explicitly programmed.
- Artificial Intelligence Vs Machine Learning Vs Data Analytics Vs Data Science
- What is Learning?

2. Types of Learning:

- Supervised Learning: In supervised learning, the algorithm is trained on a labeled dataset, where each input example is paired with a corresponding target label. The algorithm learns to map inputs to outputs, making predictions or classifications based on the patterns it learns from the labelled data.
- Unsupervised Learning: In unsupervised learning, the algorithm is given an unlabeled dataset and tasked with finding patterns or structures within the data. It learns to group similar data points together or discover underlying relationships without explicit guidance.
- Reinforcement Learning: Reinforcement learning involves training agents to interact with an environment to achieve a certain goal. The agent learns through trial and error, receiving feedback in the form of rewards or penalties based on its actions, and adjusts its behavior to maximize cumulative rewards over time.

3. Applications of Machine Learning:

- Predictive Analytics: Forecasting future trends or outcomes based on historical data, such as sales forecasting, demand prediction, or stock market analysis.
- Natural Language Processing (NLP): Processing and understanding human language, enabling applications like language translation, sentiment analysis, and chatbots.
- Computer Vision: Extracting information from visual data, including image recognition, object detection, and facial recognition.
- Healthcare: Assisting in medical diagnosis, personalized treatment recommendations, and drug discovery.
- Recommendation Systems: Providing personalized recommendations to users based on their preferences and past behaviours, as seen in streaming platforms, e-commerce websites, and social media platforms.

4. Real Time Application:

- Autonomous Vehicles: ML algorithms play a crucial role in enabling real-time decision-making in autonomous vehicles. By processing sensor data from cameras, LiDAR, radar, and other sensors, these models can perceive the surrounding environment, detect objects, predict trajectories, and make decisions such as steering, braking, and accelerating in real-time.
- Smart Home: Video played on the implementation of smart home using ML, as a real time application.

5. Advances and Future Trends:

- Latest advancements in the field of Machine Learning.
- The role of emerging technologies like Deep Reinforcement Learning (DRL), Edge AI and On-device Learning.

6. Interactive Q&A Session:

- Open floor for questions from attendees to experts.
- Discussion on implementation of real-world problems using Machine Learning.
- Advice on pursuing careers or further study in this field.

7. Conclusion and Resources for Further Learning:

- Summary of key points covered.
- Resources for further exploration, including books, courses, and websites.
- Information on upcoming webinars or events in related fields.

The Outcome of the Programme:

The program outcomes for students attending a Guest Lecture on "Introduction and Real-World Applications of Machine Learning" could include several educational and skill-based benefits.

- Students will gain a foundational understanding of how machine learning is applied in the field of smart surveillance, including the basics of video analytics technologies.
- Students gained a solid understanding of basic ML concepts, algorithms, and techniques. They grasp the fundamental principles behind supervised learning, unsupervised learning, reinforcement learning, and other core concepts.
- Students acquire practical skills in data pre-processing, feature engineering, model selection, training, evaluation, and deployment. Hands-on experience with popular ML libraries like TensorFlow, PyTorch, or scikit-learn enhances their proficiency.
- Students learned how ML techniques are applied to real-world problems across various domains such as healthcare, finance, marketing, and more. Case studies and projects demonstrate how ML can be used to solve complex problems and make data-driven decisions.

The session was concluded at 12.30 PM followed by a vote of thanks, given by Coordinator of the Guest Lecture **Ms. Arya Surendran**, Assistant Professor, Department of Computer Science & Engineering, MITS, Madanapalle.