PRIYADARSHINI INSTITUTE OF SCIENCE AND TECHNOLOGY FOR WOMEN
(Approved by AICTE, New Delhi and Affiliated to JNTUH Hyderabad)
SaiPrabhath Nagar , Khammam Rural -507003, Khammam Dist., Telangana State.
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Department of Computer Science and Engineering

2023-24 Activities

TWO-Day workshop on "**Introduction to Data Science and Machine Learning**"

Date: - 15-02-2024 & 16-02-2024

Introduction to Data Science and Machine Learning

Workshop Overview:

The two-day workshop on *"Introduction to Data Science and Machine Learning"* aimed at providing participants with an understanding of the foundational concepts and tools used in the fields of data science and machine learning. The workshop, organized by [Organization/Institute Name], took place on [Date], and was attended by over [Number] students, professionals, and enthusiasts from various domains of technology.

Objectives of the Workshop:

1. **Introduction to Data Science**: Familiarizing participants with the basic concepts, techniques, and tools used in data science.
2. **Machine Learning Fundamentals**: Introducing machine learning algorithms, their applications, and the process of building machine learning models.
3. **Hands-on Learning**: Providing practical experience with data science and machine learning libraries, like Python, Pandas, NumPy, Scikit-Learn, etc.
4. **Real-world Applications**: Demonstrating how data science and machine learning are transforming various industries, such as healthcare, finance, and e-commerce.

Agenda of the Workshop:

Day 1: Introduction to Data Science

- **Session 1: What is Data Science?**
  - Defining data science and its key areas: data collection, cleaning, analysis, and visualization.

- Overview of data science tools and technologies.
- Introduction to data types, data sources, and data quality.

- **Session 2: Exploratory Data Analysis (EDA)**
  - Techniques for exploring and understanding datasets.
  - Using Python libraries like Pandas, NumPy, and Matplotlib for data manipulation and visualization.
  - Identifying patterns and insights from data.
- **Session 3: Data Preprocessing**
  - Methods of cleaning and transforming data for analysis.
  - Handling missing data, outliers, and categorical variables.
  - Feature scaling and encoding.
- **Session 4: Introduction to Python for Data Science**
  - Hands-on Python programming with libraries like Pandas, NumPy, and Matplotlib.
  - Basic Python syntax and data structures for data manipulation.

Day 2: Introduction to Machine Learning

- **Session 1: What is Machine Learning?**
  - Explaining the difference between supervised, unsupervised, and reinforcement learning.
  - Introduction to key machine learning algorithms such as linear regression, decision trees, k-nearest neighbors (KNN), and clustering algorithms.
- **Session 2: Building a Machine Learning Model**
  - Understanding the ML pipeline: Data preparation, model selection, training, testing, and evaluation.
  - Hands-on demonstration of a simple machine learning model using Scikit-Learn.
- **Session 3: Model Evaluation and Metrics**
  - Introduction to performance evaluation metrics: accuracy, precision, recall, F1-score, confusion matrix.
  - Validating models using techniques like cross-validation.

- **Session 4: Real-World Machine Learning Applications**
  - Discussing real-world case studies of machine learning applications in fields like healthcare, e-commerce, and finance.
  - Exploring ethical considerations in machine learning.

Key Highlights of the Workshop:

1. **Interactive Sessions**: The workshop was highly interactive with engaging presentations, practical exercises, and coding challenges that allowed participants to apply the concepts in real-time.
2. **Hands-On Experience**: Participants were provided with datasets to practice on, enabling them to build and evaluate machine learning models using Python.
3. **Expert Speakers**: Industry experts and experienced professionals shared their knowledge and insights about the evolving landscape of data science and machine learning, discussing the skills required to excel in these fields.
4. **Collaboration and Networking**: The workshop facilitated a collaborative learning environment, where participants worked in groups, shared ideas, and discussed concepts with fellow attendees.
5. **Tools and Technologies**: The workshop emphasized using popular open-source tools and libraries such as Jupyter Notebooks, Pandas, NumPy, Matplotlib, and Scikit-Learn to implement data science and machine learning tasks.

Feedback from Participants:

The feedback from the participants was overwhelmingly positive. Key takeaways from the feedback included:

- **Improved Understanding**: Many attendees appreciated the comprehensive introduction to data science and machine learning, noting the clarity of explanations and depth of the topics covered.
- **Practical Knowledge**: Participants found the hands-on coding sessions particularly valuable, as they were able to build models and apply their knowledge immediately.

- **Interest in Advanced Topics**: Several participants expressed interest in more advanced workshops, particularly on deep learning and natural language processing (NLP).

Event Photos:

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TWO-Day workshop on "The Future of Computing: AI, Quantum, and Beyond"

Date: - 17-11-2023 & 18-11-2023.

The Future of Computing: AI, Quantum, and Beyond

Introduction

The workshop titled *"The Future of Computing: AI, Quantum, and Beyond"* was held with the aim of exploring cutting-edge developments in computing technologies, specifically in the fields of Artificial Intelligence (AI) and Quantum Computing. Experts from various fields of research, industry professionals, and enthusiasts gathered to discuss the state of the art in these fields and their potential future impact on technology, economy, and society.

Objectives of the Workshop

The main objectives of the workshop were to:

1. Examine the current advancements in AI and Quantum Computing.
2. Understand the intersection between AI and quantum technologies.
3. Investigate the potential challenges, ethical implications, and opportunities these technologies present.
4. Foster collaboration and idea exchange between academic researchers, tech industry leaders, and policymakers.

Agenda

The workshop featured keynote speakers, panel discussions, and interactive sessions on the following topics:

1. **Opening Remarks and Keynote Speech**
   - Topic: "AI & Quantum Computing: The Convergence of Two Revolutionary Technologies."
   - Speaker: [Insert Speaker's Name and Title]
2. **Session 1: Artificial Intelligence and Its Applications**
   - Discussed advancements in machine learning, neural networks, and automation.
   - Focus on AI applications in healthcare, finance, education, and entertainment.
3. **Session 2: The Quantum Leap**
   - Overview of quantum computing principles, quantum algorithms, and quantum hardware.
   - Real-world examples of how quantum computing can solve problems that are difficult for classical computers.

4. **Session 3: Intersection of AI and Quantum Computing**
    - Exploration of how AI algorithms can be enhanced by quantum technologies.
    - Potential for Quantum Machine Learning and its transformative role in various industries.
5. **Panel Discussion: Ethical and Social Implications**
    - A deep dive into the societal and ethical challenges posed by AI and Quantum Computing, including privacy, security, and job displacement.
    - Discussion of regulations, policies, and the need for responsible innovation.
6. **Closing Remarks and Future Directions**
    - Summarization of key insights.
    - Discussion of the next steps for researchers and industry players in advancing these technologies.

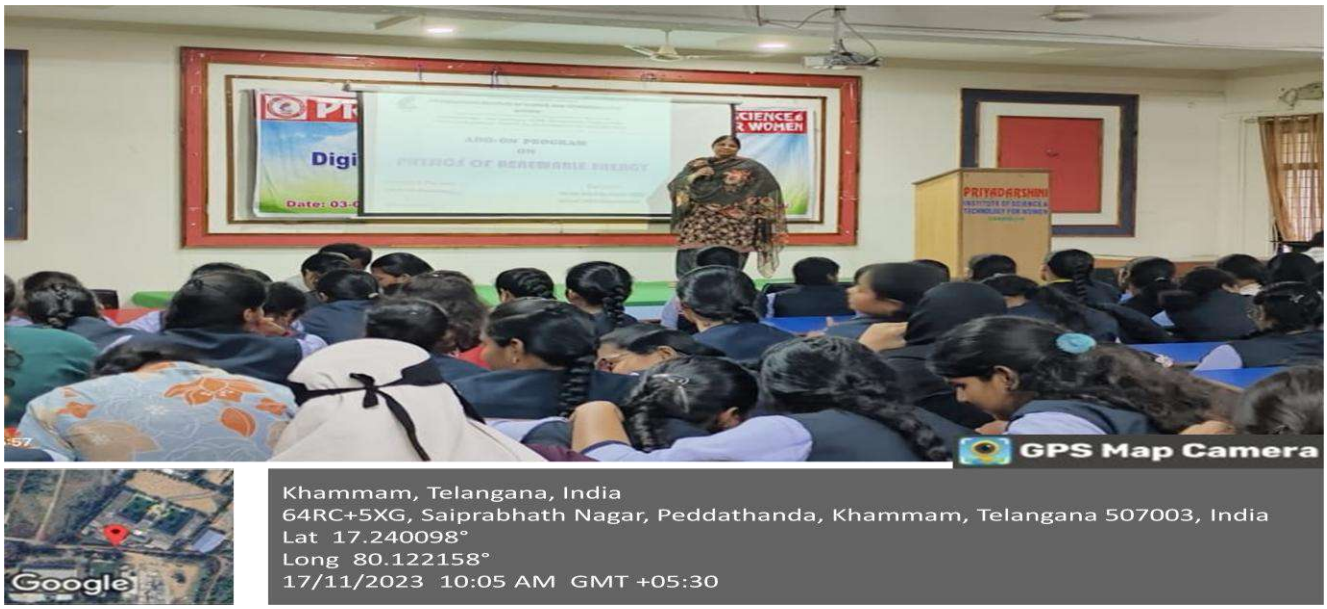
Key Highlights

1. **Artificial Intelligence (AI)**
    - AI continues to progress rapidly with significant advancements in deep learning, natural language processing (NLP), and computer vision. These technologies are now being used in real-time decision-making applications, like autonomous vehicles, AI-driven medical diagnostics, and smart manufacturing.
    - One of the highlights was a demonstration of a new AI algorithm capable of analyzing medical images and providing diagnosis with greater accuracy than traditional methods.
2. **Quantum Computing**
    - Experts provided an overview of the quantum computing landscape, showcasing significant developments in quantum hardware and algorithms.
    - IBM and Google both highlighted their advancements in creating more stable qubits, which are essential for practical quantum computations.
    - Quantum error correction and scalability challenges remain, but the ongoing research is pushing the boundaries towards more powerful quantum systems.
3. **Convergence of AI and Quantum Computing**
    - The integration of AI with quantum computing offers exciting new possibilities. Quantum machine learning, for example, promises to exponentially increase the speed and accuracy of AI algorithms.
    - Quantum-enhanced algorithms can improve optimization problems, such as in supply chain management or drug discovery, far beyond the capabilities of classical computing.
4. **Ethical and Social Implications**

- A robust discussion around the ethical implications of AI and Quantum Computing was held. The panel stressed the importance of ethical frameworks to prevent misuse of AI, such as in surveillance and weaponization, and to address concerns about data privacy.
- The potential of quantum computing to break existing encryption methods raised alarms, and there was a strong consensus on the need for post-quantum cryptography.

5. **Industry Impact and Future Potential**
   - Several industry leaders discussed how companies are investing in AI and quantum technologies to stay competitive. From AI-based automation to quantum computing for logistics optimization, the future of business is rapidly evolving.
   - There was also talk about the job market, with both opportunities and risks associated with automation. Experts suggested that the future workforce will need to upskill in quantum computing and AI-related fields to remain relevant.

Event Photo:



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Guest Lecture on "Internet Of Things" :- IoT architecture layers: Perception/sensing (sensors/actuators), network (MQTT/CoAP protocols), data processing (edge/cloud analytics), and application layers.

Date :- 13-02-2024

Guest Lecture on "IoT Architecture Layers: Perception/Sensing (sensors/actuators), Network (MQTT/CoAP protocols), Data Processing (edge/cloud analytics), and Application Layers" A guest lecture on "IoT Architecture Layers" was conducted to demystify the structured framework powering interconnected devices and smart systems for students. The session delved into the perception/sensing layer, highlighting sensors (temperature, motion, humidity) and actuators (motors, relays) that interface with the physical world to collect raw data. In the network layer, protocols like lightweight MQTT for publish-subscribe messaging and CoAP for constrained devices were explained, alongside gateways bridging local networks to the internet via Wi-Fi, Zigbee, or 5G. The data processing layer covered edge computing for real-time analytics (reducing latency in autonomous vehicles) versus cloud platforms (AWS IoT, Azure) for scalable storage and machine learning insights. Finally, the application layer was showcased through user-facing dashboards, mobile apps, and APIs enabling smart home controls or industrial monitoring. The resource person demonstrated a live prototype tracing data flow from sensor to app, addressing challenges like interoperability and power constraints. Interactive Q&A emphasized security integration across layers (e.g., TLS encryption) and future 6G enhancements. The lecture equipped students with practical knowledge for IoT design careers. Priyadarshini Institute of Science and Technology for Women The Electronics and Communication Engineering (ECE) department of

Priyadarshini Institute of Science and Technology for Women organized a hands-on lab simulating full IoT architecture. Students built layered prototypes using Raspberry Pi sensors, Mosquitto MQTT brokers, Node-RED for edge processing, and Grafana dashboards. The workshop reinforced protocol implementations and analytics pipelines for predictive maintenance scenarios. Experts guided troubleshooting common issues like packet loss in CoAP and cloud synchronization delays. A capstone project challenged teams to deploy a secure, multi-layer environmental monitoring system.

Event Photos: