



SPYPRO SECURITY SOLUTIONS Pvt. Ltd.,

C Y B E R S E C U R I T Y

3-Days Workshop On IoT INTEGRATED WITH MACHINE LEARNING (ML)

Workshop Overview:

In today's data-driven digital ecosystem, the integration of Internet of Things (IoT) with Machine Learning (ML) enables intelligent systems that can analyze sensor data, predict outcomes, and automate decision-making. From smart agriculture and healthcare monitoring to predictive maintenance and smart energy systems, ML-powered IoT software solutions play a critical role.

This three-day comprehensive workshop is designed to provide participants with strong foundational knowledge and hands-on experience in building software-based IoT solutions integrated with Machine Learning, focusing on real-world use cases, cloud platforms, and data-driven intelligence.

Day 1: Foundations of IoT and Machine Learning

Session 1:

- Welcome and workshop introduction
- Overview of Internet of Things (IoT)
- IoT architecture: devices, gateways, cloud, and applications
- Real-world IoT applications

Session 2:

- Introduction to Machine Learning
- Types of Machine Learning: Supervised and Unsupervised
- Difference between AI and Machine Learning
- Role of Machine Learning in IoT systems

Session 3:

- Overview of software tools for IoT & ML
- Introduction to Python for IoT data handling
- Understanding IoT data formats (JSON, CSV)
- **Hands-on exercise:** Simulating IoT sensor data using Python

Day 2: IoT Software Development & Cloud Integration

Session 1:

- IoT communication protocols (HTTP, MQTT)
- REST APIs and IoT data transmission
- Real-time vs batch data processing

Session 2:

- Cloud platforms for IoT (AWS / Azure / Firebase – overview)
- Storing and managing IoT data in the cloud
- Data visualization and dashboards

Session 3:

- **Hands-on exercise:** Creating a virtual IoT device using Python
- Sending live sensor data to the cloud using MQTT
- Visualizing IoT data on a dashboard

Day 3: Risk Management and Emerging Trends

Session 1:

- Understanding IoT datasets
- Data preprocessing and feature extraction
- Preparing IoT data for Machine Learning models

Session 2:

- Machine Learning models for IoT applications
- Predictive analytics and anomaly detection
- ML-based decision making for IoT systems
- Edge ML vs Cloud ML (conceptual understanding)

Session 3:

- **Hands-on exercise:** Building a Machine Learning model for IoT data prediction
- Smart alert generation based on ML output
- Mini project demonstration

In conclusion, a three-day workshop on IoT Integrated with Machine Learning can be highly beneficial for participants by equipping them with essential knowledge and practical skills to develop intelligent, data-driven IoT software solutions and address real-world industry challenges.



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