SPYPRO SECURITY SOLUTIONS Pvt. Ltd.,

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

3-Day Workshop on IoT Integrated with Artificial Intelligence (AI)

Day 1: Fundamentals of IoT and Artificial Intelligence

Session 1: Introduction to IoT

- What is IoT? Importance and real-world applications.
- IoT architecture: Devices, communication protocols, and cloud platforms.
- Sensors, actuators, and data collection in IoT systems.

Hands-On Activity

- Setting up an IoT device (e.g., ESP8266/NodeMCU).
- Reading sensor data (e.g., temperature, humidity) and uploading it to a cloud platform (e.g., ThingSpeak or Blynk).

Session 2: Basics of Artificial Intelligence

- Overview of AI: Machine learning, deep learning, and their role in IoT.
- Difference between AI, ML, and IoT.
- Tools for AI development: Python, TensorFlow, and OpenCV.

Hands-On Activity

- Writing a basic AI algorithm (e.g., simple decision-making using if-else conditions in Python).
- Exploring cloud-based AI platforms (e.g., IBM Watson, Google AI).

Day 2: Integrating AI with IoT Systems

Session 1: Data Collection and Preprocessing for AI

- IoT data pipeline: Collection, storage, and preprocessing for AI models.
- Techniques: Cleaning, feature selection, and data normalization.
- Real-time data handling in IoT systems for AI.

Hands-On Activity

- Collecting IoT sensor data and storing it in the cloud.
- Importing data into Python and preprocessing it using pandas and NumPy.

Session 2: AI Model Development and Deployment

- Training AI models using IoT data.
- Overview of supervised learning, classification, and regression models.
- Deploying AI models on edge devices or cloud platforms.

Hands-On Activity

- Train a predictive model (e.g., predicting temperature or anomaly detection).
- Deploying the model on an IoT device or integrating it with a cloud service.

Day 3: Advanced Applications and Real-World Projects

Session 1: Real-World AI-IoT Applications

- Use cases: Smart cities, healthcare, smart homes, and industrial automation.
- Overview of edge AI: Running AI models on low-power IoT devices.
- Exploring pre-trained AI models and AutoML for IoT.

Hands-On Activity

- Using a pre-trained AI model for object detection or voice recognition with IoT devices.
- Example: Recognizing faces for a smart door lock system.

Session 2: Project Development

- Building a complete IoT-AI project.

Project

Task: Smart Home Automation with AI

- Sensors: Motion, light, temperature, and voice input.
- AI Component: Predict user preferences (e.g., adjusting lights based on occupancy).
- Tools: NodeMCU, Python, TensorFlow, and OpenCV.

Closing Session

- Project presentations and live demonstrations.
- Discussing future trends in AI-IoT integration.