AI Tactical Skills: IOT Hacking & Defense

Course code: AIIOTEH

This innovative, hands-on 5-day course provides a comprehensive foundation in the integration of AI with Internet of Things (IoT) technologies. Participants will gain practical experience across a range of domains - including smart infrastructure, industrial applications, and edge computing - while learning to detect threats, analyze data, and deploy intelligent solutions. The course emphasizes hands-on learning in building, securing, and optimizing AI-enabled IoT systems.

AI Tactical Skills: IOT Hacking &Defense is offered in collaboration with Cyber2 Labs, a global security specialist-led company known for its expertise in tactical training and real-world cybersecurity solutions.

Who is the course for

This course is designed for professionals working in cybersecurity, network and system administration, digital forensics, cloud computing, and IoT technologies. It is particularly well-suited for ethical hackers, penetration testers, drone and robotics engineers, and technical project managers seeking to expand their expertise in AI-powered IoT security and defense. Ideal for those looking to stay ahead in a rapidly evolving threat landscape through hands-on, advanced training.

- Cyber Security engineers/analysts
- Network and system administrators
- Drone, &Robotic Engineers &Developers
- Drone Operators
- Digital Forensics Investigators
- Penetration Testers
- Cloud computing personnel
- Cloud project managers
- Operations support looking for career advancement

What we teach you

- Understand the fundamentals of IoT and AI
- Set up and configure development boards for AI-enabled IoT projects
- Develop and deploy AI models for various IoT applications
- Build and integrate IoT systems for smart homes, industrial applications, and smart cities
- Analyze and visualize data from IoT devices using AI and cloud platforms
- Implement a comprehensive AI-enabled IoT solution as a capstone project

Teaching materials

Each participant will get 6 months access to Premier Private Lab-Range

Each participant will receive:

- A hacking toolkit (built during the course)
- Exclusive access to the Premier Private Lab-Range for six months

Course outline

Module 1: Introduction to AI and IoT

- Basics of IoT / Artificial Intelligence
- Introduction to AI concepts and its importance in IoT
- Overview of Machine Learning (ML) and Deep Learning (DL)
- Key AI frameworks and tools for IoT (TensorFlow, PyTorch, OpenCV)

Module 2: Setting Up the Development Environment

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- Introduction to IoT Development Platforms
- AI for IoT hardware device options
- IoT Communication Protocols
- Detailed look at MQTT, HTTP, CoAP, and other protocols
- Setting up a basic MQTT server
- Connecting sensors and actuators to the development board

Module 3: Handling Data
- Delta Lake and Databricks
- Data collection
- Garbage data = no ML
- Streaming data into IoT Hub
- Z-spike anomaly detection

Module 4: Machine Learning for IoT
- IoT sensors with anomaly detection
- Regression with IoMT
- Classifying sensor with decision trees
- Deep learning predictive maintenance
- Face detection
- Z-spike anomaly detection

Module 5: Deep Learning
- Analyzing traffic patterns using AI
- Keras fall detection
- LSTM to predict device failure
- Deploying models

Module 6: AI Anomaly Techniques for IoT
- Z-Spikes using sense HAT on Rpi
- Use of autoencoders in labeled data
- Isolated Forest
- Anomalies on the edge

Module 7: Cloud Integration and Data Analytics
- Integrating IoT with Cloud Platforms
- Overview of cloud platforms (AWS IoT, Azure IoT, Google Cloud IoT)
- Connecting IoT devices to the cloud

Module 8: Computer Vision
- OpenCV camera deployment
- Deep neural nets and Caffe
- Object detection with NVIDIA Jetson Nano
- PyTorch on GPU's

Module 9: NLP (natural language processing)
- Speech to text
- Luis (language understanding with Microsoft)
- Deploying smart bots
- Enhancing bots with QnA

Module 10: Optimization of MCU

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- ESP32 for IoT in Azure
- Streaming machine learning with Kafka and Spark
- Enriching data with Kafka

Module 11: Deploying to the edge

- OTA updates
- Offloading to the web with Tensorflow.js
- Mobile model
- Distributed machine learning using Fog computing

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