Training Course on Edge Artificial Intelligence and IoT

Professional Development Training Course Outline

Category	Artificial Intelligence And Block Chain	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The convergence of **Edge Artificial Intelligence (Edge AI)** and the **Internet of Things (IoT)** is revolutionizing industries by enabling intelligent decision-making directly at the data source. This powerful paradigm shifts computation and AI algorithms from the cloud to edge devices, resulting in reduced latency, enhanced security, and improved efficiency. By processing data locally, **Edge AI-powered IoT solutions** can react in real-time to events, optimize operations, and unlock new possibilities across various sectors, including manufacturing, healthcare, transportation, and smart cities. This training course provides a comprehensive understanding of the fundamental principles, practical applications, and development methodologies for building and deploying cutting-edge **Edge AI and IoT systems**.

This intensive program equips participants with the essential knowledge and skills to navigate the rapidly evolving landscape of **distributed intelligence**. Through a blend of theoretical concepts and hands-on exercises, learners will gain proficiency in **data acquisition from IoT devices**, **edge computing platforms**, **machine learning model deployment at the edge**, **real-time analytics**, and the crucial considerations for **security and privacy in Edge AI and IoT**. By mastering these competencies, graduates will be well-prepared to design, implement, and manage innovative solutions that leverage the synergistic power of **AI at the edge** and the vast network of connected devices.

Programme Curriculum

Training Course on Edge Artificial Intelligence and IoT

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5 days

Course Objectives

This training course aims to equip participants with the following key skills and knowledge:

1. Understand the core concepts and benefits of **Edge Artificial Intelligence**.
2. Explain the architecture and key components of typical **Internet of Things (IoT) systems**.
3. Identify and evaluate various **edge computing platforms** and their capabilities.
4. Master techniques for efficient **data acquisition and pre-processing from IoT devices**.
5. Learn to design and optimize **machine learning models for edge deployment**.
6. Implement **model quantization and optimization techniques** for resource-constrained devices.
7. Develop practical skills in deploying **AI models on embedded systems and edge servers**.
8. Gain proficiency in performing **real-time data analysis and inference at the edge**.
9. Understand the principles of **federated learning** for collaborative edge intelligence.
10. Implement robust **security measures for Edge AI and IoT deployments**.
11. Address **data privacy concerns** and compliance requirements in edge environments.
12. Explore various **real-world applications of Edge AI and IoT across industries**.
13. Develop a strategic understanding of the future trends and challenges in the field of **Intelligent Edge**.

Organizational Benefits

Organizations that invest in training their teams in Edge AI and IoT can realize significant benefits, including:

- Real-time insights at the edge enable quicker responses and proactive interventions.
- Processing data locally minimizes reliance on cloud infrastructure.
- Sensitive data can be processed and stored locally, reducing the risk of breaches.
- Edge AI can optimize processes, predict failures, and automate tasks.
- The combination enables the development of intelligent and context-aware offerings.

- Optimize energy consumption and computational resources at the edge.
- Distributed intelligence enhances system reliability and scalability.

Target Audience

This training course is designed for professionals and individuals seeking to enhance their skills in the rapidly growing fields of Edge AI and IoT. The target audience includes:

1. IoT Developers and Engineers
2. Data Scientists and Machine Learning Engineers
3. Embedded Systems Engineers
4. Cloud Architects and Engineers
5. IT Professionals and System Integrators
6. Research Scientists and Academics
7. Technology Consultants and Managers
8. Students and Recent Graduates in relevant fields

Course Outline

Module 1: Introduction to Edge AI and IoT

- Overview of Artificial Intelligence and its subfields.
- Fundamentals of the Internet of Things and its ecosystem.
- The convergence of AI and IoT: Enabling intelligent edge devices.
- Benefits and challenges of deploying AI at the edge.
- Key applications and industry use cases of Edge AI and IoT.

Module 2: IoT Devices and Data Acquisition

- Types of IoT devices, sensors, and actuators.
- Communication protocols for IoT (e.g., MQTT, CoAP).
- Data acquisition techniques and strategies for IoT devices.
- Edge data pre-processing and cleaning methods.
- Time series data management and analysis in IoT.

Module 3: Edge Computing Platforms and Architectures

- Introduction to edge computing paradigms.
- Different types of edge computing devices (e.g., microcontrollers, single-board computers, edge servers).
- Overview of popular edge computing platforms and frameworks (e.g., AWS IoT Greengrass, Azure IoT Edge, Google Cloud IoT Edge).
- Designing scalable and resilient edge computing architectures.
- Containerization and orchestration for edge deployments (e.g., Docker, Kubernetes).

Module 4: Machine Learning Fundamentals for the Edge

- Review of core machine learning concepts (supervised, unsupervised, reinforcement learning).
- Considerations for model selection and training for edge environments.
- Techniques for model optimization and compression (e.g., pruning, quantization).
- Transfer learning and fine-tuning for edge AI applications.
- Evaluating model performance on resource-constrained devices.

Module 5: Deploying AI Models at the Edge

- Different approaches for deploying ML models on edge devices.
- Using specialized hardware accelerators for edge AI (e.g., TPUs, NPUs).
- Model deployment frameworks for the edge (e.g., TensorFlow Lite, ONNX).
- Over-the-air (OTA) updates and model management at the edge.
- Monitoring and debugging deployed AI models on edge devices.

Module 6: Real-time Analytics and Inference at the Edge

- Principles of real-time data processing and analysis.
- Developing event-driven applications at the edge.
- Implementing real-time inference pipelines for Edge AI models.
- Anomaly detection and predictive maintenance at the edge.
- Visualizing and interpreting edge analytics data.

Module 7: Security and Privacy in Edge AI and IoT

- Security challenges and vulnerabilities in IoT ecosystems.
- Implementing secure communication protocols for edge devices.
- Hardware and software security measures for edge computing platforms.
- Data encryption and anonymization techniques at the edge.
- Addressing data privacy regulations and compliance in Edge AI and IoT.

Module 8: Advanced Topics and Future Trends

- Federated learning for distributed AI training on edge devices.
- TinyML and ultra-low power AI for embedded systems.
- Explainable AI (XAI) for edge applications.
- Digital twins and their integration with Edge AI and IoT.
- Future trends and emerging technologies in the field of intelligent edge.

Training Methodology

This course employs a blended learning approach, combining theoretical instruction with practical application to ensure effective knowledge transfer and skill development. The methodology includes:

- **Interactive Lectures:** Engaging presentations covering fundamental concepts and advanced topics.
- **Hands-on Labs:** Practical exercises using industry-standard tools and platforms to reinforce learning.
- **Case Studies:** Real-world examples showcasing successful Edge AI and IoT deployments.
- **Group Discussions:** Collaborative sessions to foster peer learning and problem-solving.
- **Project-Based Learning:** Participants will work on a capstone project to apply their acquired skills.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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