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Edge AI and IoT Embedded Systems Training Lab

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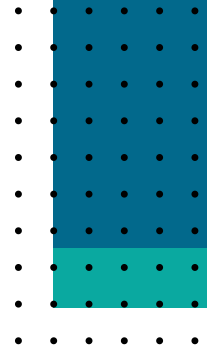
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LAB DESCRIPTION

Welcome to the Edge AI and IoT Embedded Systems Training Lab, where students explore the dynamic fusion of Edge AI and Internet of Things (IoT) in the realm of embedded systems.

This lab provides an immersive learning environment for aspiring engineers and technicians to develop hands-on skills in crafting and deploying innovative IoT solutions with embedded Edge AI capabilities.

LAB OBJECTIVES

- Introduce students to the foundational principlesof IoT and embedded systems while focusing onthe integration of Edge AI.

- Foster practical proficiency in programming, interfacing, and data processing within the contextof IoT.

- Empower students to conceive, design, and realizetangible IoT applications and projects that harnessthe power of Edge AI.
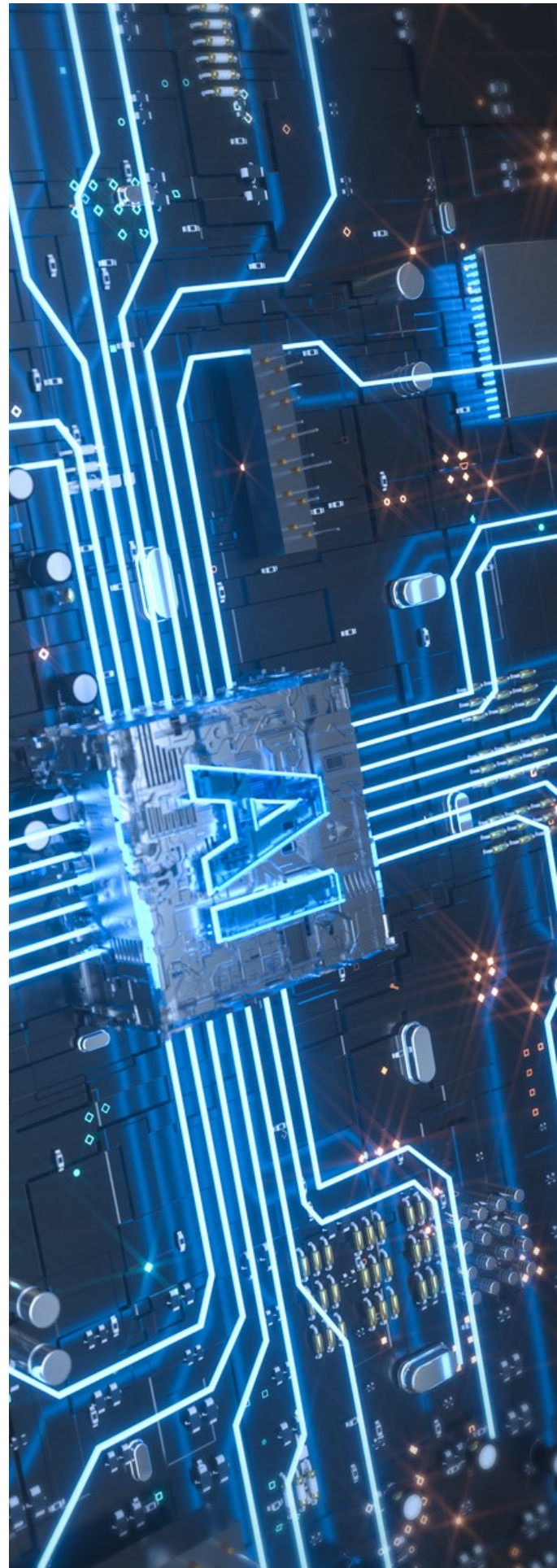
LAB MODULES

INTRODUCTION TO IOT AND EMBEDDED SYSTEMS

- Overview of IoT concepts, applications, and benefits.

- Introduction to embedded systems and their role in IoT.
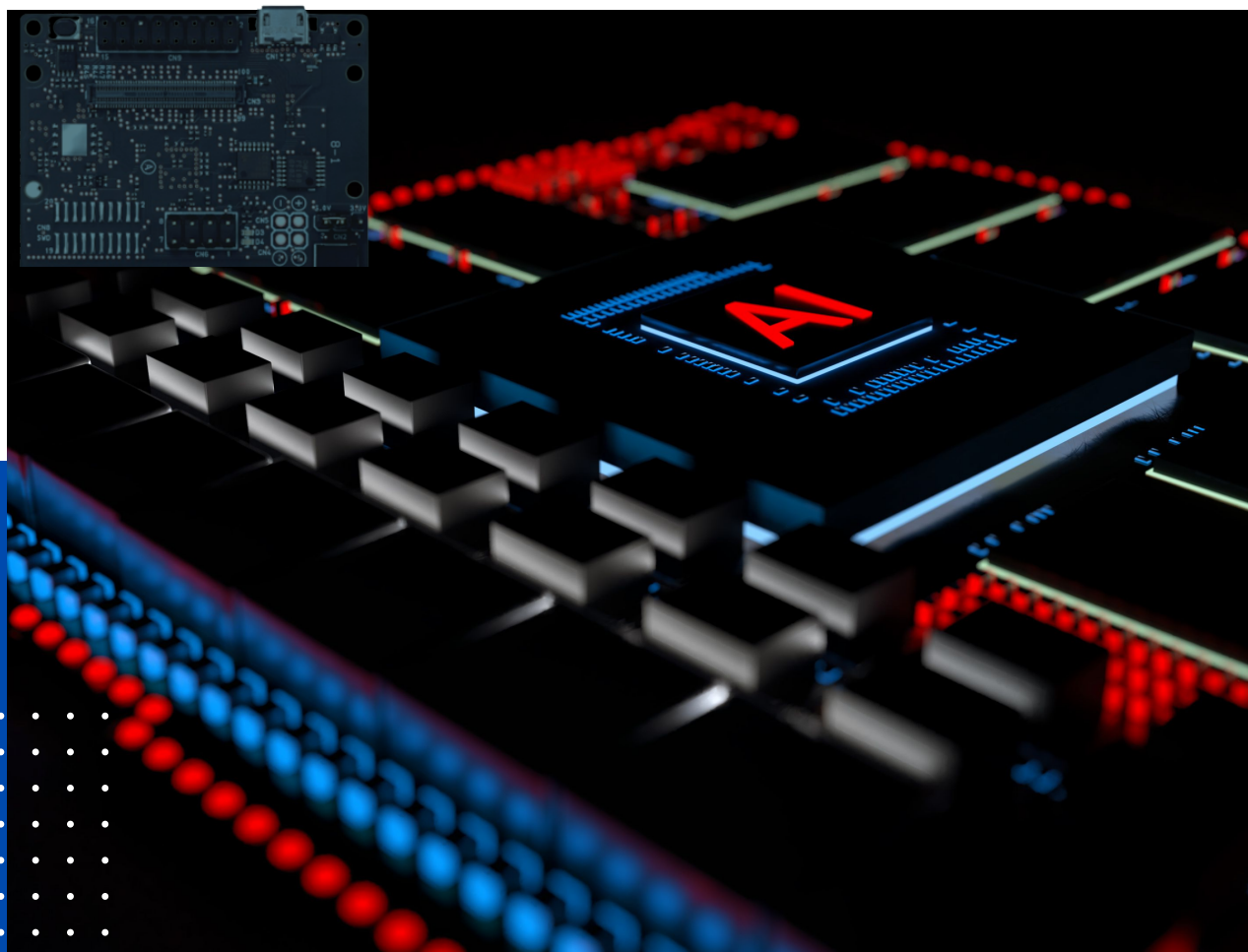
INTRODUCTION TO IOT AND EMBEDDED SYSTEMS

- Familiarization with the IoT Modules development board.

- Setting up the development environment and tools.

SENSOR INTERFACING AND DATA COLLECTION

- Interfacing with onboard sensors (e.g., accelerometer, magnetometer).

- Collecting sensor data and transmitting it to the cloud.

WIRELESS COMMUNICATION WITH IOT MODULES

- Utilizing Wi-Fi and Bluetooth for communication.

- Establishing wireless connections between IoT Modules and other devices.

EDGE AI AND MACHINE LEARNING WITH IOT MODULES

- Implementing edge AI models for data analysis.

- Real-time decision-making using AI on the IoT Modules board.

IOT DATA VISUALIZATION AND CLOUD INTEGRATION

- Sending sensor data to cloud platforms.

- Creating dashboards for data visualization and analysis.

IOT PROJECT DEVELOPMENT

- Guided project development, where students design and implement IoT solutions.

- Projects could include environmental monitoring, smart agriculture, home automation, andmore.

IOT SECURITY AND PRIVACY

- Understanding IoT security challenges and best practices.

- Implementing encryption and secure communication.

INTEGRATION WITH WEB AND MOBILE APPLICATIONS:

- Developing web or mobile interfaces to interact with IoT applications.

- Enabling remote monitoring and control.

BENEFITS FOR STUDENTS:

- Gain hands-on experience in IoT application development using the IoT Modules board.

- Understand the end-to-end process of designing, prototyping, and deploying IoT solutions.

- Develop skills in programming, sensor interfacing, wireless communication, and edge AI.

- Build a portfolio of real-world IoT projects and applications.

- Enhance employability by acquiring practical skills relevant to the rapidly growing IoT industry.

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- Sunday: Closed

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