VIT-AI: Developing AI Inference Solutions with the Vitis AI Platform

VIT-AI: Desarrollo de soluciones de Inferencia de Inteligencia Artificial con Vitis AI

Language: The classes are in Spanish, but working material is in English (available also in English at In-Company).

Who Should Attend? Software and hardware developers, AI/ML engineers, data scientists, and anyone who needs to accelerate their software applications using Xilinx devices.

Duration: 16 h (2 days, 8 h/day).

Prerequisites: Basic knowledge of machine learning concepts (Neural Networks, Machine Learning, How Convolutional Neural Networks Work, etc). Deep learning frameworks (such as TensorFlow, PyTorch, and/or Caffe). Comfort with the C / C++ / Python programming languages. Software development flow.

Introduction: This course introduces how to use the Vitis™ AI development platform in conjunction with DNN algorithms, models, inference and training, and frameworks on cloud and edge computing platforms.

The emphasis of this course is on:

- Illustrating the Vitis AI tool flow
- Utilizing the architectural features of the Deep Learning Processor Unit (DPU)
- Optimizing a model using the AI quantizer and AI compiler
- Utilizing the Vitis AI library to optimize pre-processing and post-processing functions
- Creating a custom platform and application
- Deploying a design
- Providing an overview of the Xilinx Kria™ K26 SOM and its advantages

What's New for 1.4.1

- All modules: Support added for the VCK190 & VCK5000 boards and the Kria SOM KV260
- Frameworks Supported by the Vitis AI Development Environment module: Support for 16 new models added—total of 108 models from different deep learning frameworks (Caffe, TensorFlow, TensorFlow 2 and PyTorch)
- AI Quantizer and AI Compiler module: PyTorch support updated from version 1.5 to 1.7.1
- Vitis AI Library module: New Graph Runner API introduced for DPU/CPU subgraph inference
- Two new modules added:
- Xilinx Kria KV260 Vision AI Starter Kit Overview (Lecture)
- Customizing the AI Models
- All labs have been updated to the latest software versions

Skills Gained: After completing this comprehensive training, you will have the necessary skills to:

- Describe Xilinx machine learning solutions with the Vitis AI development environment
- Describe the supported frameworks, network modes, and pre-trained models for cloud and edge applications
- Utilize DNN algorithms, models, inference and training, and frameworks on cloud and edge computing platforms
- Use the Vitis AI quantizer and AI compiler to optimize a trained model
- Use the architectural features of the DPU processing engine to optimize a model for an edge application

- Identify the high-level libraries and APIs that come with the Xilinx Vitis AI Library
- Create a custom hardware overlay based on application requirements
- Create a custom application using a custom hardware overlay and deploy the design
- Describe the Kria K26 SOM and its advantages
- Customize the AI models used in the applications in the Kria K26 SOM

Course outline: This course covers the following topics and concepts:

Vitis AI Environment Overview:

- Introduction to the Vitis AI Development Environment
- Frameworks Supported by the Vitis AI Development Environment
- Setting Up the Vitis AI Development Environment

Overview of ML Concepts.

Vitis AI Environment Toolchain:

- AI Optimizer
- AI Quantizer and AI Compiler
- AI Profiler

Deep Learning Processor Unit (DPU):

- Introduction to the Deep Learning Processor Unit (DPU)
- DPUCADX8G Architecture Overview
- DPUCZDX8G Architecture Overview

Vitis AI Library.

Custom Hardware and Application Development:

- Creating a Custom Hardware Platform with the DPU Using the Vivado Design Suite Flow (Edge)
- Creating a DPU Kernel Using the Vitis Environment Flow (Edge)
- Creating a Vitis Embedded Acceleration Platform (Edge)
- Creating a Custom Application (Edge)

Using Kria SOM

- Xilinx Kria KV260 Vision AI Starter Kit Overview
- Customizing the AI Models

Related Courses:

VIT-ACC: Accelerating Applications with the Vitis Unified Software Environment

HLS01: High Level Synthesis for Xilinx FPGAs using Vivado-HLS

SoC-ESS: Essential HW and SW of Embedded Systems Design

SoC-ADV: Advanced HW and SW of Embedded Systems Design

VIV-ESS: Designing FPGAs Using the Vivado design Suite Essential

VIV-ADV: Designing FPGAs Using the Vivado design Suite Advanced

Dates, location and registration:

Visit www.electratraining.org

Price & Course Packs and Discounts:

- *VIT-AI: 795 €*
- *VIT-ACC: 1155€*
- *VIT-AI + VIT-ACC: (-20%): 1560€*

For more than one engineer from same company / institution additional discounts.