Arm Ethos-U System Design

Summary
The Arm Ethos-U processor series training courses are designed to help embedded engineers working on new or existing Arm Ethos-U designs. Whether you’re working on design, verification or validation, for an Arm Ethos-U system, the course can be configured according to your team’s needs.

Courses include fundamental topics to enable a solid platform of understanding. The rest of the course then builds on from this with optional topics and can be tailored appropriately. Some key topics are delivered via pre course on-demand video.

A pre course call with the engineer delivering the training will help you discuss your team’s individual training requirements.

At the end of this course, delegates will be able to:

- Describe the Ethos Neural Processor Unit (NPU) main functions and supported API
- Explain the Ethos NPU data flow and block architecture
- Describe the physical model integration and the NPU interface signals
- Configure and integrate the Ethos NPU into their SoC
- Run the supplied test cases
- Describe Arm Machine Learning SW architecture
- Understand Ethos NPU (Neural Processor Unit) driver stack
- Build and test Ethos NPU driver
- Setup FPGA and run Arm NPU demo
- Build a Compute Library.
- Understand the structure of Compute Library.
- Gain knowledge about how to optimize and implement algorithm using OpenCL.
- Implement the Winograd algorithm

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<tr>
<th>Course Length</th>
<th>Delivery Method</th>
<th>Location</th>
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<tr>
<td>1-2 Days</td>
<td>Classroom</td>
<td>Virtual or Onsite</td>
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Audience:
Engineers working on a SoC project using Ethos-U NPU and carrying out System Design or verification.

Prerequisites:
- A working knowledge of RTL design
- Experience of IC verification flow
- Machine Learning using Arm Online Training Module
- Background knowledge about Machine Learning
Related Products
Arm Ethos-U55

Topics
Agendas will be created from the following list of fundamental and optional topics

### Fundamental Topics

- **Machine Learning using Arm** Online introduction to Machine Learning using Arm Products
- **Arm ML SW Architecture**, an introduction to the Architecture, how to build it, driver structure and support neural networks
- **Ethos NPU Overview**, Machine Learning overview, Arm’s heterogeneous ML platform, Supported APIs, Deliverables, Performance scenarios and summary
- **Ethos NPU Architecture**, definitions, data flow, the block architecture, programmers’ model and boot flow
- **Ethos NPU HW Integration**, Getting Started, the Implementation process flow, configuration, Physical Model integration, Clock and resets, Interface signals, Memory system considerations, Testbenches and Integration Kit
- **NPU Driver Stack**, How to Build one, the driver structure and supported neural networks
- **FPGA setup**, the requirements, connects, resources and software available plus a Arm NPU Demo.

### Optional Topics

- **ArmNN** – How to build and structure ArmNN and how to run Caffe Model
- **Compute Library Introduction**, Compiling, structuring as well as Gaussian Pyramid, Integral Image, SGEMM and Winograd optimisation

♥ = Online and on-demand.