

Hands-On Workshop on Huawei Ascend NPU Embedded Development

Using the Atlas 200i DK A2 & OrangePi Alpro (8T)

This hands-on workshop provides practical experience with the Huawei Atlas 200i DK A2, powered by the Ascend 310B chip. Participants gain an in-depth understanding of the Da Vinci architecture used in Huawei Neural Processing Units (NPUs). The workshop emphasises Python-based development and real-world AI deployment on embedded hardware.

It equips participants with industry-relevant skills in edge AI development using Ascend NPUs, enabling deployment beyond traditional GPU-based systems.

DURATION

3 days + optional 4th

HARDWARE

Atlas 200i DK A2

OrangePi Alpro (8T)

PREREQUISITES

Working Python

DELIVERY

On site, Pakistan

LEARNING OUTCOMES

- Understand the Ascend ecosystem and the Da Vinci architecture
- Configure and operate the Atlas 200i Developer Kit
- Run AI inference using Python and Jupyter
- Convert and deploy models using the Ascend Tensor Compiler (ATC)
- Deploy vision, speech and image enhancement models on edge hardware

SCHEDULE & CONTENTS

DAY 1 — Hardware, OS & Ascend architecture

Goal: understand Ascend hardware, the Da Vinci architecture, and build a working development system.

Session 1. Introduction to Ascend 200i DK A2 / OrangePi Alpro (8T)

- Ascend ecosystem overview
- Edge AI use cases and application domains
- Ascend product family overview
- Edge versus cloud Ascend devices
- Conceptual comparison with GPU / Jetson platforms

Session 3. Da Vinci architecture deep dive

- AI Core, Vector and Cube engines
- Memory hierarchy and data types (FP16 / INT8)
- Differences between Ascend NPUs and GPUs

Session 2. Physical setup & I/O interfaces

- Power and thermal considerations
- HDMI, USB and Ethernet connectivity
- Camera, sensor and storage options
- First boot and hardware validation

Session 4. OS installation & network setup

- Ubuntu / openEuler installation
- SD card image creation
- Network, SSH and remote access configuration
- Launching the Jupyter Notebook environment

DAY 2 — System architecture & first inference

Goal: access the system, understand the runtime architecture, and run the first AI inference.

Session 5. System access & navigation

- User accounts and permissions
- SSH login and file system navigation

Session 7. Image classification — ResNet

- ImageNet classification pipeline
- Running inference and testing custom images
- Measuring inference performance

Session 6. Jupyter Notebook workflow

- Notebook structure and lab organisation
- Verifying Ascend runtime availability

DAY 3 — Model conversion, vision & speech

Goal: convert models and deploy multiple AI modalities.

Session 8. Ascend Tensor Compiler (ATC)

- ONNX to OM model conversion
- Hardware-aware optimisation parameters

Session 10. OCR & speech recognition

- OCR pipeline and text extraction
- Speech-to-text inference using ASR models

Session 9. Object detection — YOLOv5

- YOLO architecture overview
- Bounding box visualisation and inference

DAY 4 — Advanced vision & creative AI (optional)

Goal: run advanced vision pipelines and deployment-style demos.

- Image enhancement and HDR reconstruction
- Custom classification use cases
- Style transfer and GAN-based applications
- Medical and scientific AI inference
- Semantic segmentation and portrait enhancement
- YOLO inference on video and live camera streams



Instructor — Mughees Sarwar Awan

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To book this workshop for your department or team, contact Orange Pi Pakistan

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