

Edge AI Solution Accelerated by Hardware-aware Machine Learning

INTRODUCTION

In IoT era, hundreds of millions of cameras are being deployed in the cities, retail stores, railway stations, manufacturing lines, and everywhere, but the ability to extract insights from this tremendous information has been more challenging than ever. Aupera, a Video AI innovator, has focused on providing highly efficient and most agile video AI solution based on Xilinx FPGA, achieving low power consumption, low latency and fast deployment adapting to vastly diversified AIoT user scenarios.

PRODUCT OVERVIEW

Aupera Edge AI solution- AUPV205 smart box provides solution for full pipeline of video processing & AI analytics from video streaming protocol processing, decoding, AI analytics, and encoding. It features Xilinx Zynq® UltraScale+™ MPSoC EV device with video codec and supports many common peripherals and interfaces for embedded video analytics use case. It is equipped with a quad-core ARM® Cortex™-A53 application processing unit, dual-core Cortex-R5 real-time processing unit, Mali™-400 MP2 graphics processing unit, 4KP60 capable H.264/H.265 video codec, and 16nm FinFET+ programmable logic.

Product Highlights :

- Processor: Quad-core ARM® Cortex™-A53 application processor + dual-core Cortex-R5 real-time processor.
- 8 x 1080P30 streams or 16 x 720P30 streams H.265/H.264 concurrent transcoding.
- Hardware-aware Machine Learning acceleration
- PL-side independent memory bus.
- Video Codec close coupling with Embedded CV+ML
- Mature video AI software stack ready for deployment



Aupera Edge AI Solution

- > Video processing + real-time AI within the single device
- > 80% reduced Latency on video analytics
- > Hardware-aware machine learning acceleration enabling fast deployment
- > Deployment ready AI applications and customization available
- > Support 3rd party accelerator

SOLUTION OVERVIEW

Standard AI Application:

Provide hassle-free deployable AI application & support customized AI application (Available on all Aupera platforms)

Face detection	Human detection	Safety helmet	Pose detection
Break-in alarm	Object classification	Safety vest	Car type recognition
Face ID	Car-plate recognition	Parking detection	Torso detection

Customized AI Application:

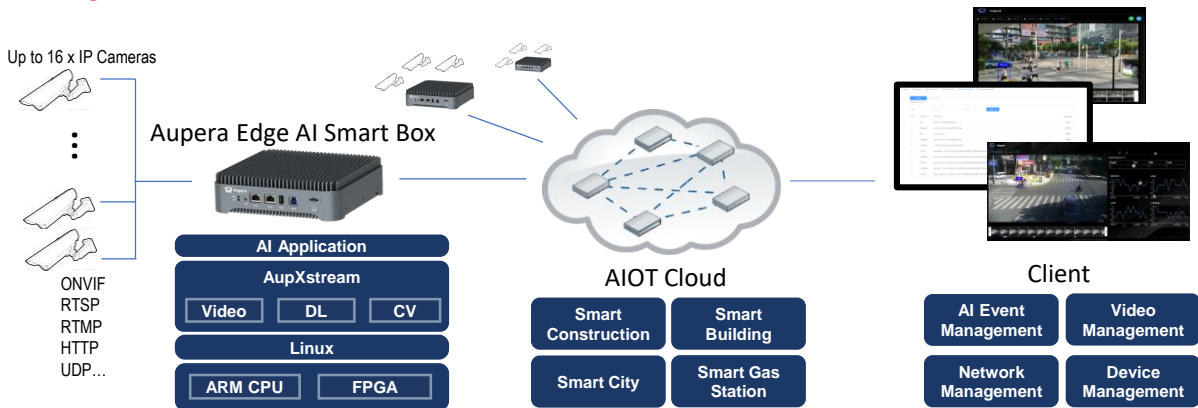
Hardware-aware machine learning acceleration significantly speed up customized AI application Implementation.

SOLUTION DETAIL

Video processing and embedded real-time video analytics functions

- **Processing capacity:** 8 channels@1080P30 or 16 channels@720P30
- **Energy efficiency:** 3.5W/stream@1080P
- **Video codec:** H.264/H.265 compatible
- **Applications:** Video De/Encode/Transcode/Stream mixing/AI analytics
- **Efficient acceleration engines:** JPEG, pre/post processing, scaling, rotation, watermark
- **AI Performance:**
 - Face detection: Up to 240FPS/Node (640x360), up to 11520FPS/system
 - Yolov3 object detection: Up to 64FPS/Node (416x416), up to 3072FPS/system
 - Pedestrian Attributes: Processing time < 5ms (96x128)
- **Supported DL frameworks:** Caffe, Tensorflow, Darknet
- **Supported DL networks:** YoloV3, Densebox, Resnet, MobilenetV1-SSD, VGG16, InceptionV3/V4, and more
- **Supported DL models:** Face detection/recognition, Object detection, Video analytics, Pedestrian attributes, Pose Estimation, Segmentation, and more

DEPLOYMENT



TAKE THE NEXT STEP

Learn more about Aupera: www.auperatech.com

Other form factors available, please reach out to Aupera sales for details— sales@auperatech.com

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