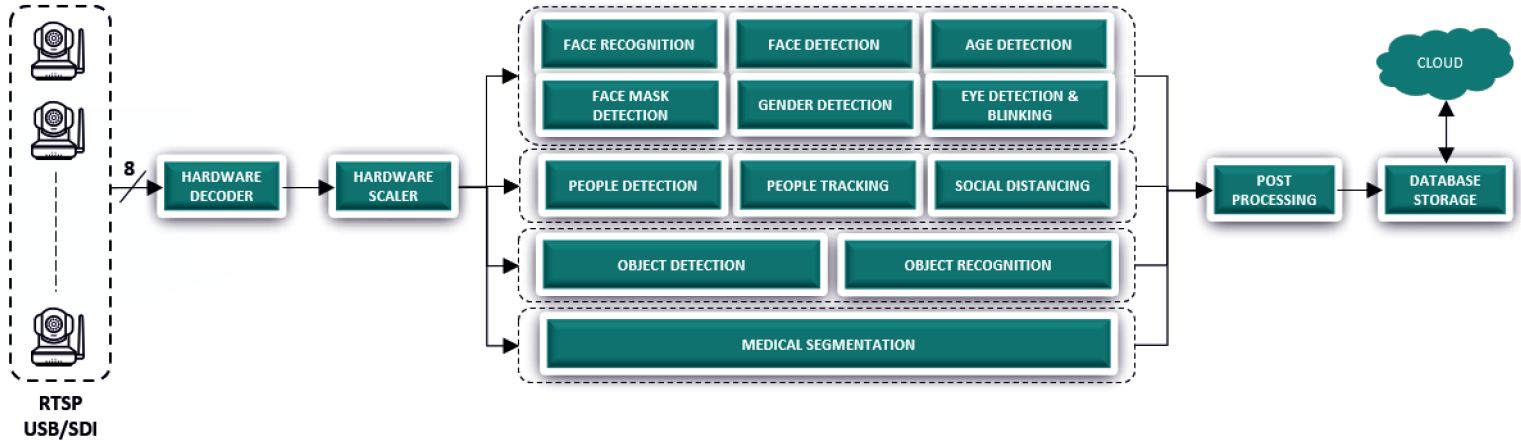


With thousands of cameras and other video sources available around the city, applying traditional techniques to a highly variable situation in a live city environment could be difficult. But what if a platform could think, identify, and track relevant occurrences in a video. This is where video analytics comes into play. Turning a video into actionable insights.

In order to reduce the complexity to design and deploy AI solutions on the field, Corazon-AI platform is enabled with deploy ready solution for video analytics.

iWave Systems, in partnership with MakarenaLabs, developed this deploy ready solution for machine vision applications. The solution "Musebox" can do face analysis, people analysis, object analysis.

Specifications



This solution could process live stream or local files on its 8-channels simultaneously with 30fps/channel. The in-built H.264/H.264 codec & hardware scaler convert the streams feed them to AI engine for the processing. AI engine (DPU) deployed on FPGA which will extract features up to 2622 points for facial analysis process.

Corazon-AI provides the flexibility to implement the pre/post processing operations on the FPGA in-order to achieve the 30fps/channel. On the energy consumption side, Corazon-AI consumes optimized power 1.5W/stream to process the inference. Corazon-AI can store the processed data in local database as well as cloud transfer via ZMQ, RabbitMQ protocols.

Solution Details

FACE ANALYSIS	PEOPLE ANALYSIS	OBJECT ANALYSIS
Face Recognition(no mask) Accuracy: 99% FPS/Channel: 33 Mean Error: ↑	Mask Detection Accuracy: 88% FPS/Channel: 8 Mean Error: ↑	Object Detection Accuracy: 72% FPS/Channel: 20 Mean Error: ↑
Face Recognition(with mask) Accuracy: 99% FPS/Channel: 33 Mean Error: ↑	Gender Detection Accuracy: 99% FPS/Channel: 33 Mean Error: ↑	Object Recognition Accuracy: 98% FPS/Channel: 30 Mean Error: ↑
Face Landmarking - caffe Accuracy: 10.24% Caffe	Eye Detection & Blinking Accuracy: 70% FPS/Channel: 1000 Mean Error: ↑	Text Detection - Darknet Accuracy: 73.55% FPS/Channel: 20 Mean Error: ↑
Glasses Detection Accuracy: 99% FPS/Channel: 33 Mean Error: ↑	Age Detection Accuracy: 5% FPS/Channel: 33 Mean Error: ↑	OCR (Text Transcription) Accuracy: 3% FPS/Channel: 32 Mean Error: ↑
Face Detection Accuracy: 99% FPS/Channel: 33 Mean Error: ↑	Emotion Recognition Accuracy: 95% FPS/Channel: 300 Mean Error: ↑	Medical Segmentation

Accuracy
 FPS/Channel
 Mean Error
 Mean Average Precision



The adoption of new technology is now on a vertiginous way and the rise of new age is all about Artificial Intelligence. In Artificial Intelligence (AI) there has been a growing requirement for intelligent devices to make real-time decisions on the edge. The Edge AI devices are expected to run complex neural networks and deep learning algorithms while maintaining low latency, power efficiency, and accuracy.

iWave's Edge AI Platform Corazon-AI, built on Xilinx Zynq® UltraScale+™ MPSoC is designed to decode the real-world challenges and dispense an intelligent edge solution for video analytics, image processing, robotics and the growing spectra of AI applications across the globe.

Specifications

Hardware

CPU & GPU

Quad/Dual Arm Cortex-A53 Based Application Processing Unit (APU) Up to 1.5GHz
Dual Cortex-R5 Real-Time Processing Unit Up to 600MHz
ARM MALI - 400MP2 up to 677 MHz

Memory

64bit, 4GB DDR4 with ECC for PS (Upgradable up to 8GB)
32bit, 2GB DDR4 for PL (Upgradable up to 4GB)

Storage

8GB eMMC Flash (Expandable to 256GB)
EEPROM for MAC Address Secure Key
M.2 SATA extended storage for recording
USB3.0 x 2

Connectivity & Cameras Supported

Wi-Fi 802.11 b/g/n/ac, BLE 5.0, Gigabit Ethernet x 2, CAN x 2*
Cameras: RTSP(IP) x 8, USB x 2, 3G-SDI x 1

Display & IO's

4K Display Port Display with Audio
SPI x 1, CAN x 2, I2C x 1, GPIO header

In-built FPGA Modules

AI Engine

DPU 4096 @330MHz for ~1352 GOPs
DPU 3136 @330MHz for ~1035 GOPs

Encode/Decode

H.264/H.265
8x 1080p @ 30fps
4x 1080p @ 60fps
32x 480p @ 30fps
JPEG, MJPEG*

iWave Systems brings over 20+ years of valuable experience in high-performance FPGA based design and development, offering an extensive portfolio of standard/custom System On Modules, SBC based on Zynq & Zynq MPSoC SoC devices and comprehensive Engineering design services involving embedded hardware, FPGA, and software development in servicing to multiple domains across the globe such as Industrial, Medical, Automotive, IoT and Computer Vision. To complement, iWave Systems also offers an extensive suite of FPGA based IP Cores such as ARINC818 Complete Suite, Storage, Legacy Processors and Video Processing Ips. We also build Edge AI solutions targeted towards industrial and smart city AI applications.

Note: iWave reserves the right to change these specifications without notice as part of iWave's continuous effort to meet the best in breed specification. The registered trademarks are propriety of their respective owners.

Software

Embedded Linux

Petalinux Package integrated with Yocto
Linux Kernel 5.4.xx
Vision Library for Hardware Acceleration*

Vitis AI Stack

Caffe TensorFlow PyTorch Darknet Keras

Packages Integrated

FFMPEG gstreamer Qt JSON OpenCV
OpenSSH SFTP NumPy python PostgreSQL

Cloud Integrated

aws Azure IBM Cloud

Automotive Standard

SAE J1939*

Robotics Standard

ROS*

General Features

Environment Specification & Compliance

REACH, ROHS & CE*

Enclosure Dimension & Form Factor

101mm x 81mm x 33mm (Enclosure) with Passive Heat Sink
100mm x 72mm (Form Factor)

Power Input & Operating Temperature

12V, 5A AC Adaptor
0°C to +85°C (Extended), -40°C to +85°C (Industrial)

* In Progress

Video Analytics on Corazon AI

The device can be ordered online from the iWave Website : <https://www.iwavesystems.com/product/corazon-ai-edge-ai-platform>
Or from our Local Partners in your region : <http://www.iwavesystems.com/about-us/business-partner.html>

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