Innodisk FPGA Product

Innodisk IPA / 2022 / NOV

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From IPC to AI
We Are The Key to The Industry Growth

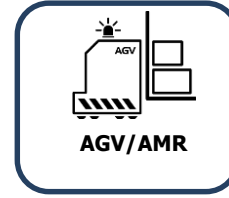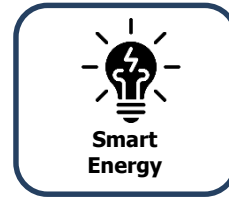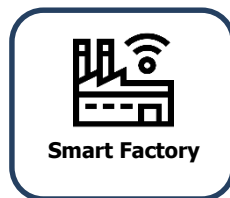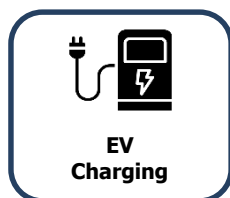**Industrial PC Market** → **Vertical Market (IIoT)** → **Smart Vertical Market (AIoT)** → **Intelligence Vertical Market (AI)**

Innodisk AI Integration for Vertical Market

Innodisk AI Suite + 3rd Party ISV

Flash BU
WT 2.5SSD

aetina

AI Accelerator

IPA BU
InnoAgent OOB Module

IPA BU
USB Camera

DRAM BU
WT DRAM

IPA BU
MILLITRONIC
antzer
I/O Card

Smart Agriculture

EV Charging

Transportation

Smart Factory

Smart Energy

AGV/AMR

Innodisk Complete AI Suite SDK

Innodisk AI Suite SDK

iCAP – Cloud AI

iVIT – Edge AI

Nvidia Model Zoo	FPGA Model Zoo	ASIC Model Zoo	3rd Party AI Model

iSeries Software Tool / SDK

iSMART	iTracker	iOPAL	iRAID

Innodisk Cloud Administration Platform

- AI Model deployment & Management
- Flexible/Friendly visual dashboard
- Remote device control
- Out-of-band management
- Support ISV development

Innodisk Vision Intelligent Toolkit

- Offer No-Code experience for AI trainings & inference
- Support heterogeneous platform (NVIDIA GPU, Intel CPU, Xilinx FPGA)
- Support ISV owned development
- Reduce AI learning curve by up to 50%

4

Innodisk AI Suite SDK _ Cloud AI

iCAP – Cloud AI

iCAP™ is a browser-accessed management and maintenance platform that allows you to manage heterogeneous edge AI solutions easily.

Device Management

- Device Information
- Group Management
- Alert & Notification
- Out-of-Band Management

AI Management

- AI Model Management
- AI Model Group Deployment
- Edge AI Solution Compatibility
- Multiple Frameworks

Optimizing your remote experience with iCAP & InnoAgent

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Remote Manage

Out-Band

OS heartbeat monitoring
Quick to check if OS is running

GPIO configuration
Easy setting and trigger GPIO

Remote power switch
Remote power on/off and reboot with power pin

OTA
Easy to update the FW version

Remote maintenance
Support log view and console remotely

Full OOB function with InnoAgent
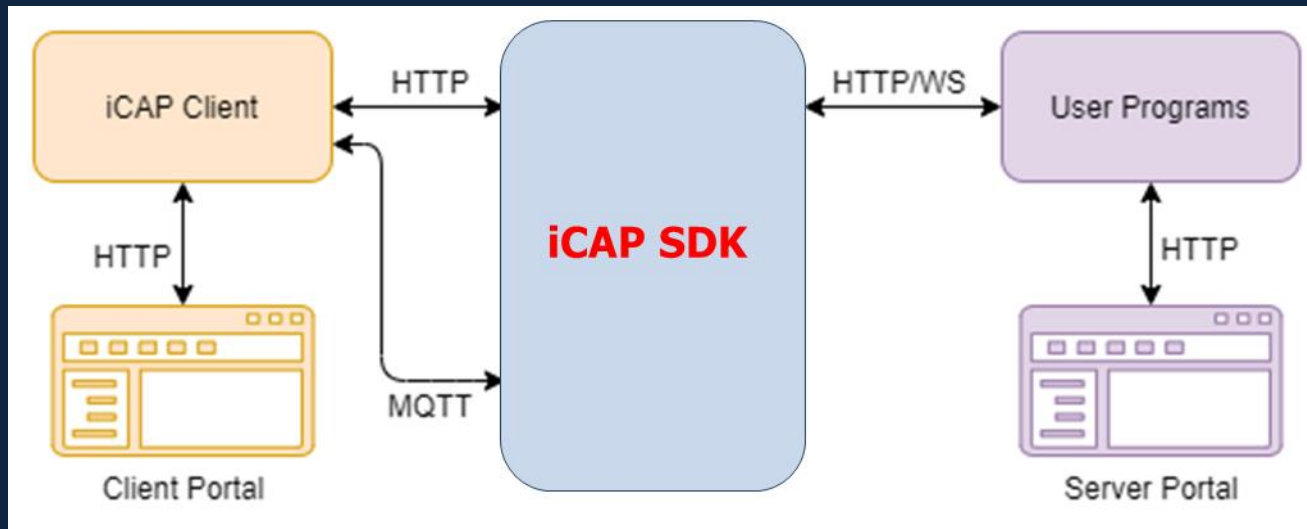
iCAP 2.0 SDK

01 iCAP server SDK

02 Dual-band management
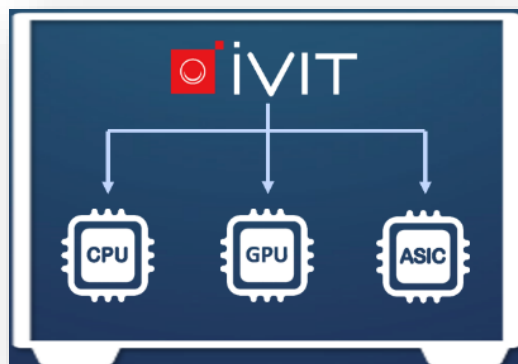
03 Secondary development for Website

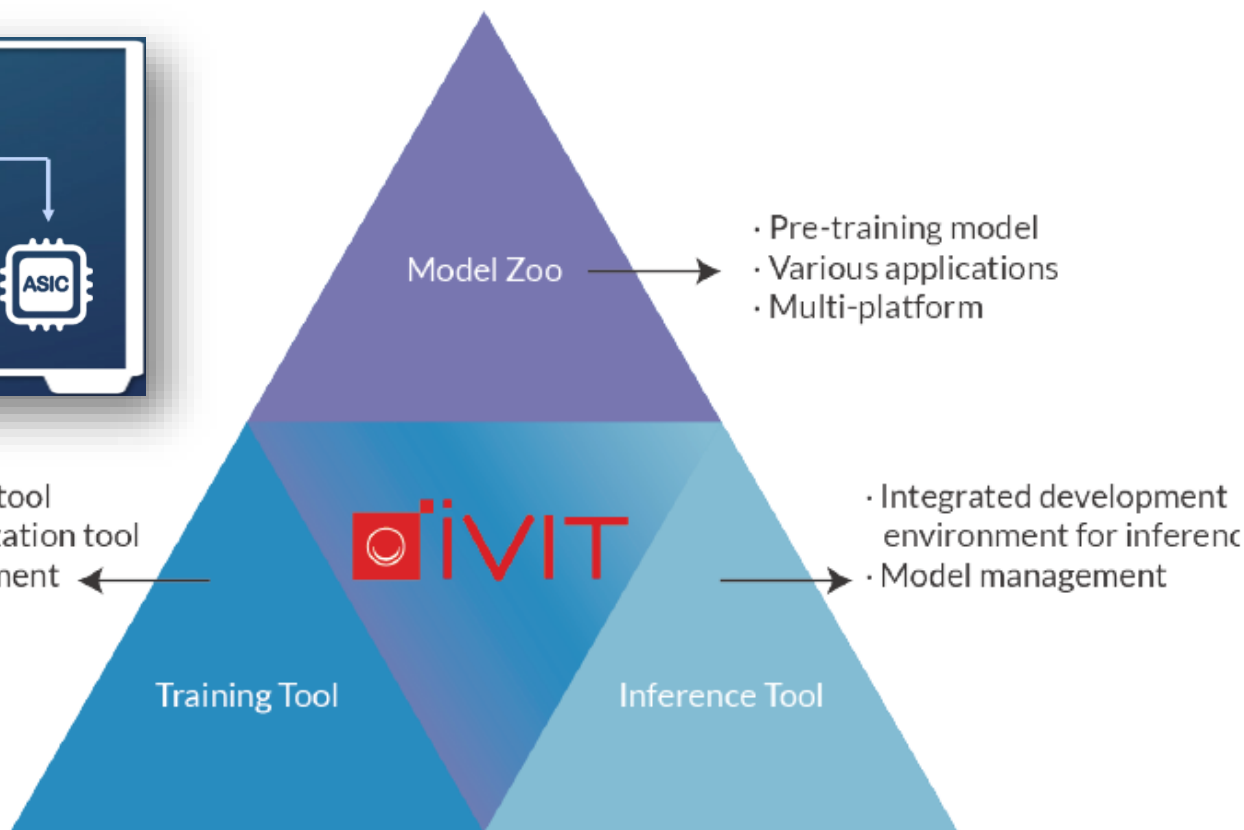**04** Support multiple connection protocol (MQTT/HTTP, COAP(TBD))

Innodisk AI Suite SDK _ Edge AI

iVIT(Vision Intelligence Toolkit) provides a **"No code"** development tool suitable for training customized AI models aimed at different verticals and quickly performing model inference tasks on Heterogeneous platforms.

iVIT

CPU GPU ASIC

Model Zoo
· Pre-training model
· Various applications
· Multi-platform

iVIT

· Image labelling tool
· Training visualization tool
· Model management

· Integrated development environment for inferenc
· Model management

Training Tool

Inference Tool

iVIT

Traditional Programming

Using iVIT

STEP 1	Setup environment
STEP 2	Assign file path
STEP 3	Pre-process
STEP 4	Hyper-parameter
STEP 5	Training model
STEP 6	Evaluating model

STEP 1	Select dataset
STEP 2	Training model
STEP 3	Evaluating model

VS

Reducing the learning curve above 50%

iVIT

iVIT-T

iVIT-I

1. Sun (99%)
2. Cloud (88%)
3. Mountain (95%)

✓ Input : Raw images & Labeled images.

✓ Process : iVIT-T.

✓ Output : Pre-trained model.

✓ Input : Images, Videos, IPCam & WebCam

✓ Process : iVIT-I

✓ Output : Recognition result.

High Flexibility, Low Power Consumption, Low Latency

- Preserve Design Investments and Scale Products across the Same Platform

Smart Camera

Surveillance

Motor Control

Machine Vision

User Applications

- - - - - - - - - - - - -

Domain-Specific Development Environment

Open CV Library	Vitis AI	Vitis Video Analytics SDK (VVAS)	3rd Party Library

- - - - - - - - - - - - -

Vitis Accelerated Libraries

Compliers	Analyzers	Debuggers

- - - - - - - - - - - - -

Vitis Core Development kit

Vitis Runtime Libraries (XRT)

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Zynq UltraScale+ MPSoC

System-On-Module
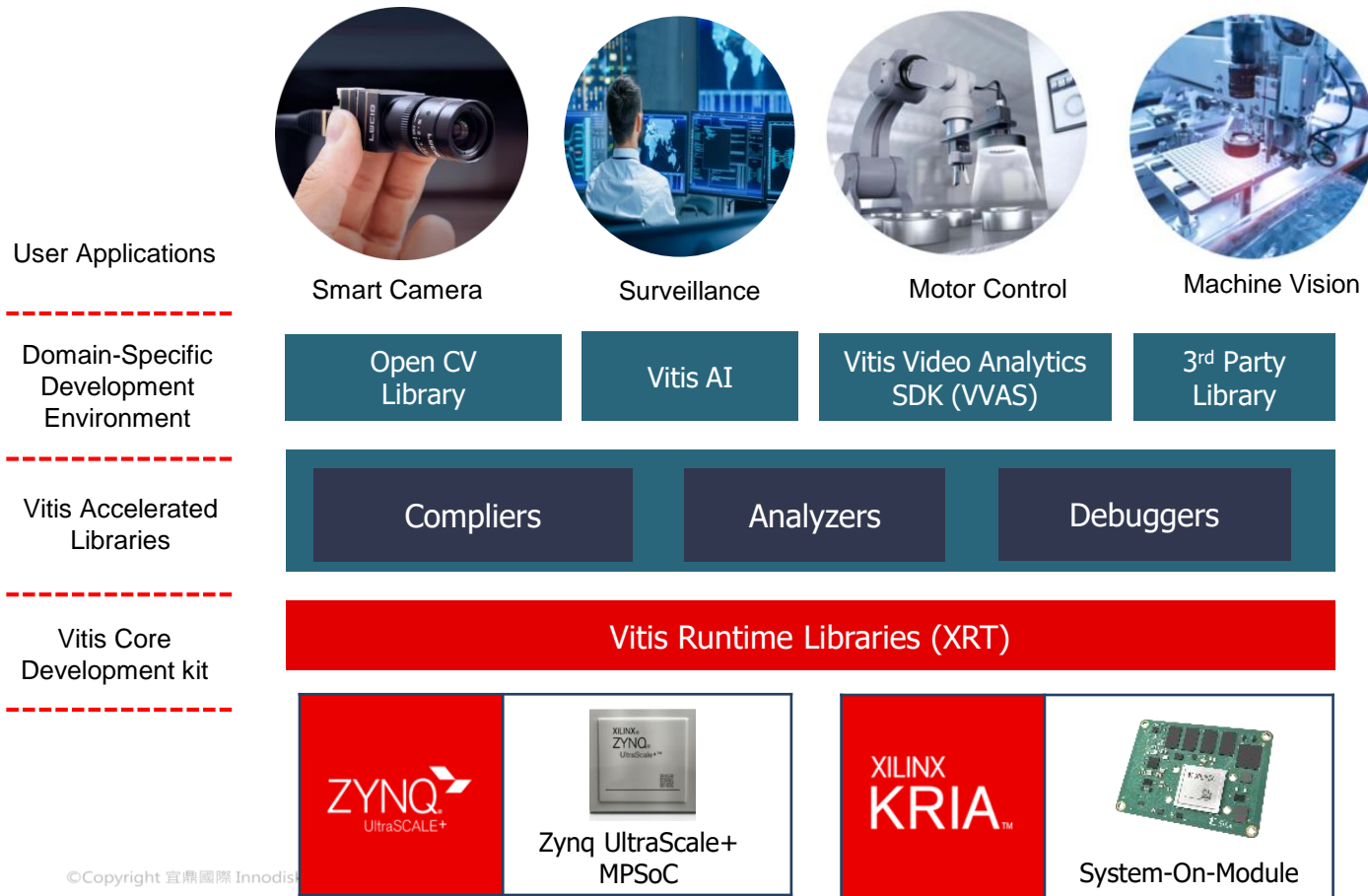
FPGA Machine Vision Solution Kit

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XILINX KRIA™
System-On-Module
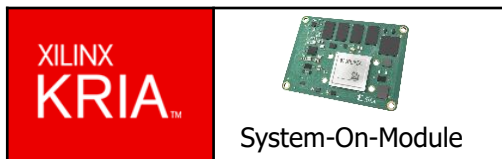
ARM	256K	1.4TOPS	4K60p
Cortex-A53 Quad-Core Subsystem	System logics cells	AI Processing Performance	H.264/265 Video Codec

Embedded Systems

Surveillance

Automation
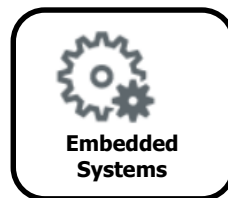
**EXMU-X261
(Board-Level)**

**EXOU-X261
(System-Level)**

MP : 23" Q2

- Xilinx Kria K26 SOM featuring low latency and high-performance DPU
- Supports InnoAgent out-of-band (OOB) remote management
- Offers PCIe M.2 2230/2242 for wireless and storage devices connection
- Offers UART/I2C/CANbus/GPIO connection through 15pin Terminal Block
- Prebuilt hardware acceleration with BSP/pre-trained AI models
- Offers 4x USB 3.1 Ports for high-speed data transfer
- Supports hardware security TPM2.0

Factory

Automated Edge AI Solution for Vision Inspection

This solution combines the advantages of FPGA Machine Vision Solution Kit and out-of-band module to achieve automated vision inspection with out-of-band remote management, which use deep learning to detect and label assembly defect and can be deployed and managed in large numbers at the same time

Challenge

It's time-consuming to bundle up the cameras, sensors and AI computing platform and soothing the software compatibility issue

USB

OOB
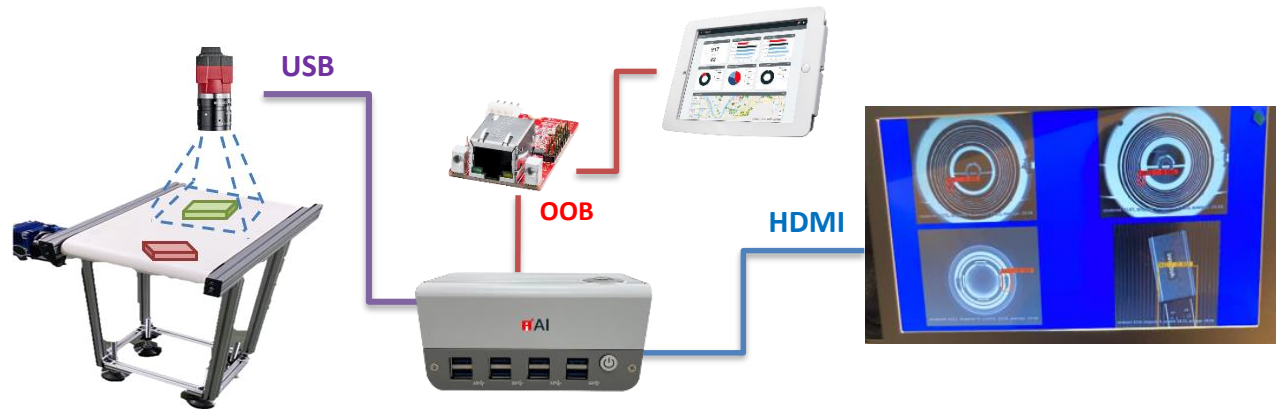
HDMI

Smart City
Multi-Channel Camera Accelerated Application
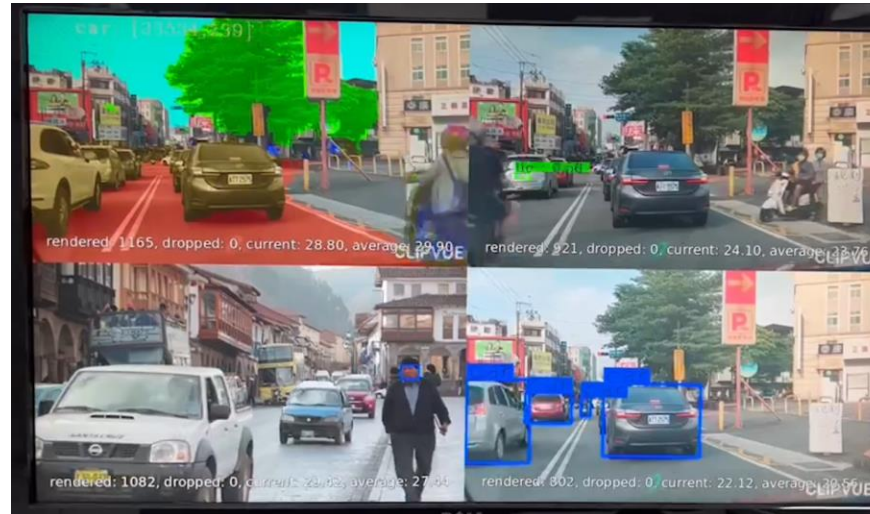
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Features

- 4 AI models inference simultaneously

- 4-ch video input inference with low RAM usage & power consumption by using VVAS SDK

- HDMI Display Out

Segmentation @30fps

yolov4 tiny@25fps

densebox@30fps

SSD@25fps

FPGA Products Roadmap

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Board Level

EXSU-XU31: Smart Surveillance Board — ZYNQ UltraSCALE+
- Build for Image & Video Processing
- Rich Interfaces for Video Input — *Planning*

EXMU-X261: Machine Vision Board — XILINX KRIA
- Build for AI Machine Vision Applications
- Low latency and high-performance DPU — 22" OCT

EXMC-X261: Robotics Evaluation Board — XILINX KRIA
- Build for Robotics Applications with ROS 2
- Support Time-Sensitive Networking (TSN) — *Planning*

System Level

EXOU-XU31: Smart Surveillance Board — ZYNQ UltraSCALE+
- Build for Image & Video Processing
- Rich Interfaces for Video Input — *Planning*

EXOU-X261: Machine Vision Solution kit — XILINX KRIA
- Build for AI Machine Vision Applications
- Low latency and high-performance DPU — 23" Q2

2022 H2 | 2023