NVIDIA Jetson

Edge AI Computing

Platform

aetina

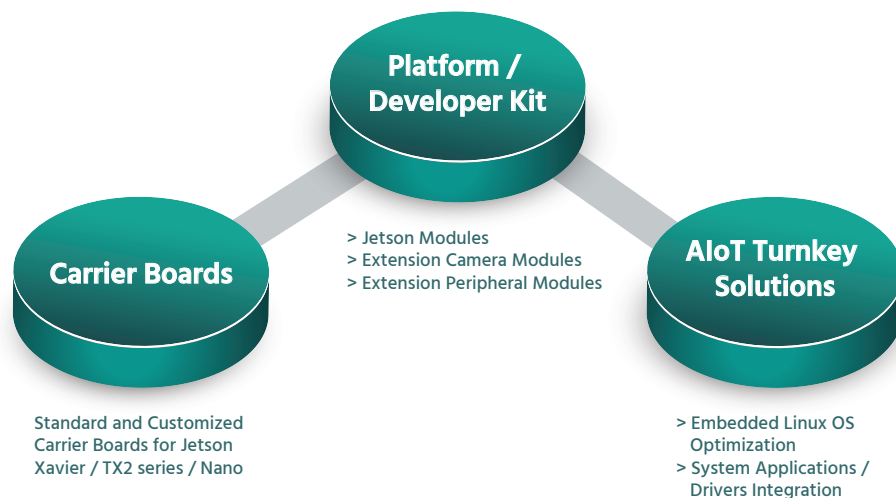# Application-Oriented Jetson Carriers & Platforms

Giving You the Power to Make the World Smarter

We are here to help you discover the progressive GPU technology and the future of edge embedded computing. Building intelligent machines to sharpen the competitive edge, specifically exponential adoption of GPU-accelerated computing, has taken off.

Leveraging Nvidia the latest and powerful Jetson AGX Xavier, TX2 series, and Nano platform, Aetina brings its incredible computing performance, superior deep learning, GPU computing capabilities and high energy efficiency into embedded systems based on evaluation Carrier Boards and well-featured Developer Kits.

With them, you could accelerate your Artificial Intelligence (AI), visual-computing and compute-intensive embedded projects, such as Drones, UAVs, Autonomous Robotics, Mobile Medical Imaging and Intelligent Video Analytics (IVA) in a time-to-market, easy and low-risk way.

AETINA MAJOR OFFERING

Platform / Developer Kit

> Jetson Modules
> Extension Camera Modules
> Extension Peripheral Modules

Carrier Boards

Standard and Customized Carrier Boards for Jetson Xavier / TX2 series / Nano

AIoT Turnkey Solutions

> Embedded Linux OS Optimization
> System Applications / Drivers Integration

PRODUCT ADVANTAGES

Time-to-Market Deep Learning Projects

- Customized and ready-to-ship on-board edge AI computing solutions
- Versatile driver-ready extension I/O modules
- Linux, Android OS customization and full BSP support
- Support latest APIs (OpenGL 4.5, ES.3.1 and Vulkan) and SDK
  (libraries for deep learning, computer vision and GPU acceleration)
- Application-oriented software consultant, customization and system integration
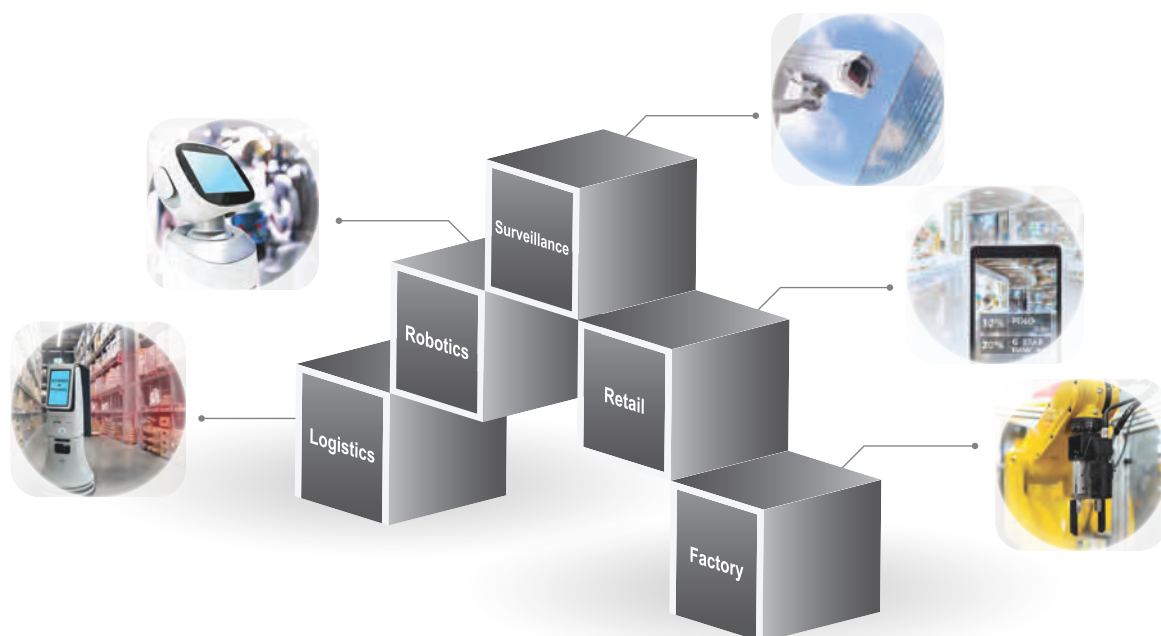- Ready for multiple-algorithm processing.

Unmatched Performance to AI-Computing

- Leading Nvidia Jetson Xavier / TX2i / TX2 / TX2 4GB / Nano SoMs processors
- Features up to 512 CUDA cores
- Over 2.5 TFLOPS and more than 30 TOPS of AI operation performance
- 4Kx2K 60 Hz video encode and decode capabilities
- Support Nvidia CUDA 9.0

Enhanced Industrial-grade GPGPU Design

- Alliance with embedded standardization: COM Express, Nano-ITX and Mini-ITX
- Up tp 5-years longevity product life cycle
- Extended operating temperature range -40˚C ~ +85˚C and conformal coating support
- Modularized thermal solution support
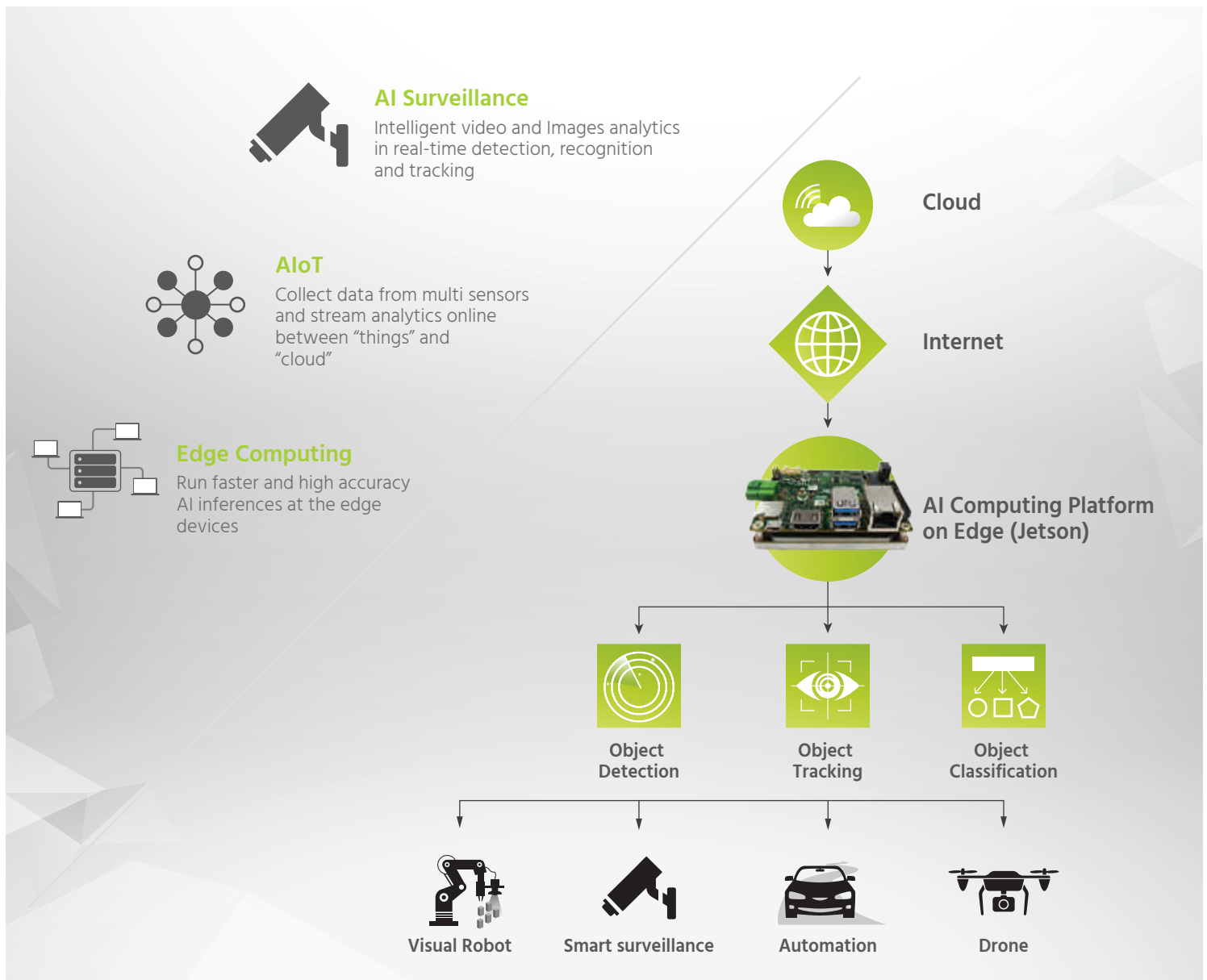
MARKET APPLICATIONS

Quickly Build an Edge AI Platform for GPU Deep Learning

Aetina Jetson 6x MIPI Supported Carrier Board – AN310

Flexible I/O Expansion Enabling a Diverse Range of AI Applications in the Embedded
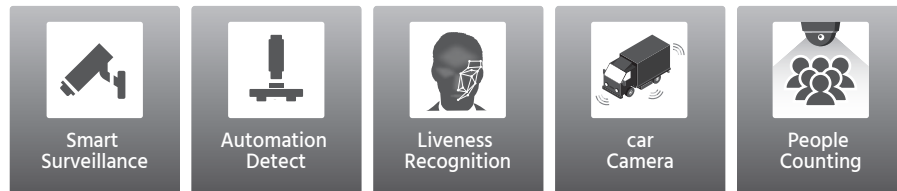
AN310 is a multi-camera solution supported carrier board, high flexibly configures up to 12 lanes of CSI connectors through customizable extension modules. Based on the Nvidia Jetson TX2 series, you can get real-time AI performance with high-efficiency and low-power platforms with small footprints. Aetina provides two kinds of driver-ready VID module, which are CSI-II and FPD-LINK III, for different purpose. One Aetina VID module supports 6x 2M or 3x 4K cameras. With 6x FPD-Link III cameras, which support up to 10 meters cable length, developers can set up a 360-degree surrounding view in the scenario, then sending the omnidirectional vision back to Aetina Jetson platform for real-time inference.

AI Surveillance
Intelligent video and Images analytics in real-time detection, recognition and tracking

AIoT
Collect data from multi sensors and stream analytics online between "things" and "cloud"

Edge Computing
Run faster and high accuracy AI inferences at the edge devices

Cloud

Internet

AI Computing Platform on Edge (Jetson)

Object Detection

Object Tracking

Object Classification

Visual Robot

Smart surveillance

Automation

Drone

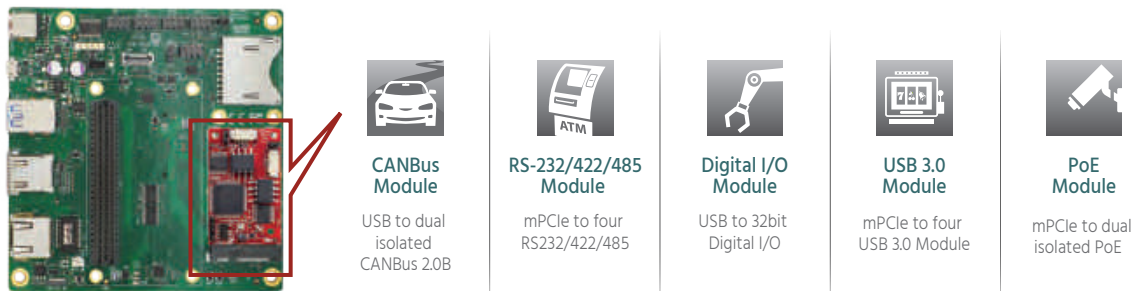# Software / Hardware Integration Value-added Services

EVID | Extension Video Image Detection Service

Aetina provides a thorough service of extension video image detection that helps the developer deploy multiple external camera modules for applications with machine vision.

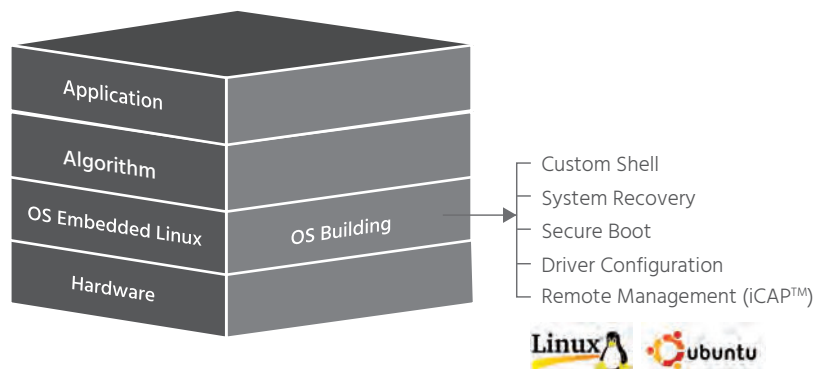| Smart Surveillance | Automation Detect | Liveness Recognition | car Camera | People Counting |

EIOA | Extension I/O Access Service

Aetina combines hardware, firmware and software to provide complete embedded peripheral I/O modules with preload API and Drivers. That assists developers flexibly to expand the systems' I/O connectivity, meanwhile shorten deployment and development time.

CANBus Module	RS-232/422/485 Module	Digital I/O Module	USB 3.0 Module	PoE Module
USB to dual isolated CANBus 2.0B	mPCIe to four RS232/422/485	USB to 32bit Digital I/O	mPCIe to four USB 3.0 Module	mPCIe to dual isolated PoE

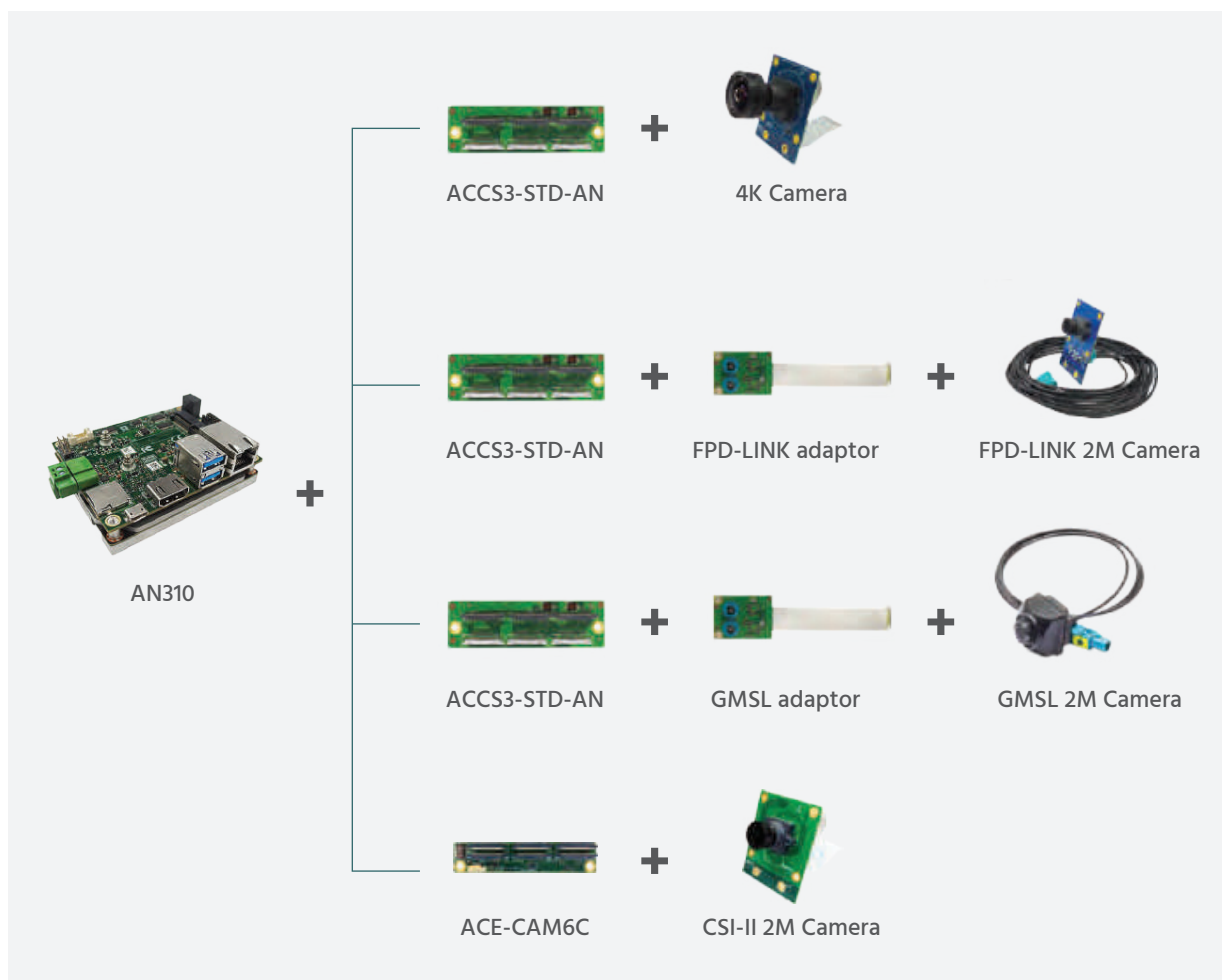## iNAVI | Customized Operating System

Aetina provides operating system customization service, that assists developers built their embedded OS based on Linux, featuring one-key, easy-to-use system recovery mechanism and tailored security control. This optimizes their applications best reliability, security and individuality.

Application
Algorithm
OS Embedded Linux
Hardware

OS Building

- Custom Shell
- System Recovery
- Secure Boot
- Driver Configuration
- Remote Management (iCAP™)

Linux ubuntu

Aetina's Eco-System Service

Stepping into AIoT industry, instead of getting it alone, you may need partners to overcome the difficulty from various problems and different professional situations. Aetina has already prepared a team of partner for you! These are the detail of AIoT service from Aetina's edge AI computing platform.

EVID Service: Enrich your AI environment with machine vision to see the world

AN310 +

ACCS3-STD-AN + 4K Camera

ACCS3-STD-AN + FPD-LINK adaptor + FPD-LINK 2M Camera

ACCS3-STD-AN + GMSL adaptor + GMSL 2M Camera

ACE-CAM6C + CSI-II 2M Camera

EIOA Service: Enlarge the abilities of your AI platform to make a powerful solution

mSATA Interface	mSATA Storage Support Up to 1TB			
mPCIe interface	LAN	PoE	RS232	CANbus 2.0B
	Digital I/O	USB 3.0	LTE	Capture Card

Product Selection

Model Number	AN110	AN310	ACE-N510	ACE-N622	AX710
Module Support	Nvidia Jetson Nano	Nvidia Jetson TX2 / TX2 4GB / TX1	Nvidia Jetson TX2 / TX2 4GB / TX1	Nvidia Jetson TX2 / TX1	Nvidia Jetson AGX Xavier / Xavier 8GB
Dimensions	87.4mm x 67.4mm (3.425" x 2.637")	87mm x 70mm (3.425" x 2.755")	87mm x 50mm (3.425" x 1.968")	120mm x 120mm (4.72" x 4.72")	112mm x 107 mm (4.33" x 4.213")
Expansion	1x M.2 E Key 2230	1x mPCIe (PCIe x1 / USB2.0)	N/A	1xFull-minicard (PCIe x1 / USB2.0) 1xFull-minicard (PCIe x1 / mSATA)	1x M.2 M Key 2280 1x M.2 E Key 2230
Display	1x HDMI 1x eDP	1x HDMI	1x HDMI	1x HDMI	2x HDMI
Audio	HDMI Integrated	HDMI Integrated	HDMI Integrated	HDMI Integrated 1x I2S interface	HDMI Integrated 1x I2S interface
USB	2x USB3.2 Gen.1 Type A(Hub mode) 1x USB2.0 Micro AB OTG	2x USB3.0 Type A 1x USB2.0 Micro AB OTG	2x USB3.0 Type A 1x USB2.0 Micro AB OTG	2x USB3.0 Type A 1x USB2.0 Micro AB OTG	2x USB3.0 Type A 1x USB2.0 Typc C 1x USB2.0 Micro AB OTG
Ethernet	1x GbE	1x GbE	1x GbE	1x GbE	1x GbE (Internal) 2x GbE (Extension)
Camera Inputs	1x 2-Lanes MIPI CSI-2 FPC 15 pins 1x 4-Lanes MIPI CSI-2 FPC 36 pins	6 x2-Lane MIPI CSI-2 (Extension board ACE-CAM6C) 3 x4-Lane MIPI CSI-2 (Extension board ACCS3-STD-AN00)	N/A	1x 2-Lanes MIPI CSI-2	4x iPEX connector (each one for 4 lanes)
SD Card	1x microSD Card	1x microSD Card	1x microSD Card	1x SD Card	1x microSD Card
MISC. External Interfaces	1x System Control (PWR / RST / Recovery) 5x GPIO 1x RS232 2x UART (1x debug UART) 1x I2C 1x SPI 1x FAN	1x System Control (PWR / RST / Recovery / Sleep) 5x GPIO 2x CAN BUS 1x RS232 1x UART(Debug) 1x I2C 1x FAN	1x System Control (PWR / RST/ Recovery / Sleep) 4x GPIO 2x CAN BUS 1x RS232 1x UART(Debug) 1x FAN	1x System Control (PWR / RST/ Recovery / Sleep) 4x GPIO 2x CAN BUS 1x RS232 1x UART (Debug) 1x I2C (3.3V) 1x SPI (1.8V / 3.3V) 1x FAN 1x 12V output 1x 5V output	1x System Control (PWR / RST / Recovery / Sleep bottom) 5x GPIO 2x CAN BUS 1x RS232 1x UART (Debug) 1x I2C (3.3V) 1x SPI (3.3V) 1x FAN 1x UART (3.3V) 1x Extension slot (60 pins)
Power Requirements	+12V DC only	9.0 to + 19.6V DC	+12V DC only	Wide Input + 12 to + 19V DC	9.0 to + 20V DC
Operation Temperature	-40˚C ~ +85˚C	-40˚C ~ +85˚C	-20˚C ~ +70˚C	-20 ˚C ~ +70 ˚C	-25˚C ~ +80˚C

AI & Deep Learning
Application Example

Edge AI Computing Solutions
Enabling 3D-modeling and Intelligent Analysis in Minutes with Deep Learning

Challenge

In 3D modeling, it is the process of developing a three-dimensions mathematical representation of the surface of any object.

The process contains 3D rendering or computer simulation are computationally intensive. With CUDA-enabled GPU, applications can achieve an order of magnitude less-time. Bring the system with 3D cameras and sensors into a highly mobility devices however are particularly low-energy consumption required.

Solution

Aetina **Jetson Edge AI Computing Solutions** uses the power of cutting-edge Jetson Xavier / TX2 series / Nano to drive more than a TFLOP/s of performance to calculating, analyzing and acting on tremendous amounts of data from the cameras and sensors with operating at less than 10 Watt. These GPU-accelerated Jetson solutions also have outstanding parallel processing in deep learning and AI computing. Let you maximize efficiency, quality and productivity in object detection, image recognition, motion tracking and digital reconstruction.

Real-word Applications

- **Anti-collision Devices:** vehicle system, drone , UGV, warehouse robot, service robot
- **Surveillance:** facial recognition, intelligent video analytics (IVA), retail store analytics
- **Production Automation:** pick-and-place robotic arm, automated optical inspection

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