Innodisk's Machine Vision Solution Kit Powered by AMD's Kria SOM

Solution Delivers High-Performance with Low Latency in a Small Box for Vision AI and Video Analytics Applications at the Edge

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PARTNER

INDUSTRY

Industrial, AIoT

CHALLENGES

Innodisk wanted to create a machine vision kit for vision AI and video analytics applications. It needed a flexible, highly integrated, and power-efficient processing solution with low latency and long-term availability.

SOLUTION

The Kria™ SOM from AMD Xilinx significantly improved performance, reduced hardware development time, and simplified inventory management.

RESULTS

Working with AMD, Innodisk has seen many improvements in the capabilities of its AI models and also the training process.

AMD TECHNOLOGY AT A GLANCE

Kria SOM

Innodisk has been serving industrial markets for many years, so James Chen, a senior specialist in the department of embedded peripherals at Innodisk, says that it's not surprising when the company is able to anticipate customer needs before being asked about it.

"As a leading company in the industrial markets, we often know our customers' needs well in advance and can produce creative products to address them," he said.

Chen said that for AIoT systems, as an example, it's more important than ever to help ensure high availability and have reliable management tools. That thinking was the reasoning behind the company's recent launch of InnoAgent, a hardware module that allows out-of-band remote management of systems, even if they have crashed, or are completely offline. Innodisk not only provides the hardware, but the full, turn-key solution.

That same connectedness to the market led Innodisk's to develop its machine vision solution kit (EXMU-X261) targeting industrial applications, including defect detection and image classification.

CHALLENGE

Innodisk had recently noticed that more of its customers were building products aimed at the AI and IoT spaces.

The company evaluated an AI solution from another chip company with software development tools and product lines for different computing power demands. "We found that this solution may not be suitable for all customers," Chen said. "The first reason is that the power consumption is quite high and not suitable for a fanless environment. The second reason is that there is not enough flexibility in the products. For example, the support for low-precision AI models is not good. A third reason is that the company does not provide long-lifetime supply, which is exactly what industrial market customers need."

"On the other hand, low power consumption, high flexibility, and long-term availability are the key advantages and characteristics of AMD's FPGA-based solution," Chen said, "and that's why we choose the Kria SOM for our product."

SOLUTION

The Innodisk machine vision solution kit is designed for vision AI and video analytics applications at the edge and is based on AMD's Kria SOM module. Featuring adaptive SoCs with an integrated FPGA fabric, Kria SOMs offer high performance with low latency in a small box.

"The Kria K26 SOM provides at least three-times more performance than the competitor's GPU when running the YOLOv3-tiny model," Chen said. "The K26 SOM-based module design reduced hardware development time and simplified inventory management. Added to that, the powerful Vivado

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AMD

development tool helped the software developers work with familiar AI frameworks in a short time."

Chen said that Innodisk learned of AMD's Kria K26 SOM through the distributor, AVNET. "AVNET's FAE teams provided sufficient resources to help Innodisk quickly start the development of one of our first products, the machine vision solution kit. We are very satisfied with the service provided by AVNET."

RESULT

"Compared to previous product development experiences with other vendors, AMD and AVNET have provided us with excellent support," Chen said. The benefits have included rich development tools with excellent documentation; many reference implementations on Github, a healthy developer community, and very strong AVNET FAE support, which helped us greatly reduce debug time."

"AI technology is constantly changing," Chen continued. For example, the architecture of a deep neural learning network is always evolving and new specs like the TSN (Time-sensitive Networking) protocol are still being modified. AMD's FPGA product is an ideal solution due to its high flexibility characteristic. It is quite an important feature in some vertical markets, especially factory automation."

"In the past, we thought FPGA products had powerful functions but were not easy to use. But last year, we purchased the new KV260 starter kit with FPGA-based adaptive SoCs, and found

that AMD provides a wealth of development tools, such as EDA, Vivado™, Vitis™, and Vitis-AI with rich technical documents, that greatly helped us understand FPGA products and accelerated the launch of our products," Chen said.

"We are very impressed with the product line breadth and depth of AMD, especially in the field of AI applications," Chen continued. "Due to the small and diverse product characteristics of industrial markets, FPGAs are the most suitable AI solution for industrial AI applications based on three benefits: low power consumption, high flexibility, and long-term availability.

"We see AMD as one of the leaders in the industrial space, and their FPGA-based products offer very unique features for industrial automation," said Don Yu, special assistant to the chairman at Innodisk. "Working with AMD, we have seen many improvements in the capabilities of our AI models, and also the training process, based on the Vitis AI SDK," added Yu. "We've really learned a lot on how to shorten the AI process from training to inference.".

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About Innodisk
Innodisk is a service-driven provider of industrial embedded flash and DRAM storage products and technologies, focusing on the enterprise and industrial markets. The company's technology helps customers build reliable products for Artificial Intelligence of Things (AIoT), Healthcare, Aerospace, and other industrial markets.

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