ADLINK
Leading EDGE COMPUTING

Solution Brief

Deep Learning Acceleration Platforms Deliver the Optimal Mix of SWaP and AI Performance

The DLAP Series enables system developers to optimize around performance, budget, power consumption, and space limit constraints at the edge.



Powering AI in Edge Applications

There is growing demand to perform image rendering, image analysis, compute acceleration, and artificial intelligence (AI) in many embedded market segments, including healthcare, manufacturing, maritime, aerospace, transportation, and gaming. AI technologies will also enable machines to improve their own performance and make insightful decisions, as is needed for autonomous manufacturing in the move to Industry 4.0.

A trend in many industries is to transition from simple edge devices feeding data to the cloud for analysis to performing sophisticated inferencing and pattern-matching at the edge. Edge AI can respond faster than cloud AI by eliminating the need to send large data volumes to the cloud. Data security is also enhanced because less data is vulnerable to tampering as it is sent across networks. For mobile applications, edge AI reduces the reliance on unreliable network connections (i.e., dead zones, service outages) by performing AI functions locally.

Some AI computing solutions are heterogeneous, meaning they use graphics processing units (GPUs) to speed up parallel task processing and CPUs to manage large amounts of data and run statistical computations. Compared to homogeneous systems (with either CPU or CPU), heterogeneous systems typically have better system responsiveness, but they also present some significant design challenges:

- Power consumption: GPU + CPU consumes more power than GPU or CPU
- Form factor: GPU + CPU requires more space than GPU or CPU
- Product availability: Many GPUs have relatively short life spans

ADLINK DLAP Series

ADLINK's experienced design team overcomes these challenges with the Deep Learning Acceleration Platforms (DLAP) Series, a set of compact, industrial-grade, and size, weight, and power (SWaP)-optimized platforms for AI-based applications. The DLAP series is designed for durability in harsh industrial and embedded environments, operating at extended temperature, shock, and relative-humidity ranges. These systems are built with long lifecycle products, including GPUs, to significantly extend their availability.

The DLAP Series enables systems integrators, OEMs, and ODMs to lower development costs and shorten the time to market. Figure 1 shows the three categories of DLAP platforms, optimized for SWaP, AI processing, or both.

SWaP

Choose from four compact units that contain an NVIDIA® Jetson™ supercomputer on a module. They are well-suited for AI-based inferencing and machine vision, and in some cases, autonomous machine control.

SWaP-Performance Optimized

The DLAP 3000, 3100, and 3200 utilize Intel® Core™ processors and Mobile PCI Express Module (MXM) graphics cards to deliver compact, thermally-optimized, industrial designs with powerful inference capability.

High Performance

The DLAP 4000 and 8000 are designed to handle heavy AI workloads, built with a server-grade Intel® Xeon® processor or an Intel® Core™ processor, and one or two dual-slot NVIDIA Quadro based PCI Express Graphics (PEG) cards.

Customization Services

As an NVIDIA® Quadro® Embedded Partner, ADLINK can customize solutions for different embedded market segments, enabling customers to rapidly harness the power of AI at the edge. With long-term success in designing embedded modules, carrier boards, and systems, ADLINK can cater to individual projects by quickly developing edge AI platforms based on NVIDIA Quadro Embedded GPUs and Jetson modules.

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High Performance

Application Examples	Models	Size (Liters)	CPU Options	GPU Performance (TFLOPS)	GPU Form Factors
▪ Object recognition for pick and place ▪ Edge servers	DLAP-4000	9.9	Intel® Xeon® or Intel Core™ Processor	130.5 (FP32)	Full-Height, Full-Length PEG card
	DLAP-8000	15		>200 (FP32)	
▪ Mobile medical imaging ▪ Endoscopy systems	DLAP-3000	3.2	Intel® Core™ Processor	75.2 (FP32)	MXM Type A/B/B+
	DLAP-3100	3.2			
	DLAP-3200	5.6			
▪ Machine vision ▪ Edge autonomous systems	DLAP-201-JT2	0.8	NVIDIA® Jetson™ System on Module	1.5 (FP16)	NVIDIA® Jetson™ System on Module
	DLAP-211-JNX	0.9		6 (FP16)	
	DLAP-211-Nano	0.9		0.5 (FP16)	
	DLAP-301-JNX	2.0		6 (FP16)	
	DLAP-301-Nano	2.0		0.5 (FP16)	
	DLAP-401-Xavier	1.8		5.5-11 (FP16)	

Low SWaP

Figure 1. ADLINK DLAP Series

Deep-Learning Consultancy Services

ADLINK offers consultancy services via deep learning profiling to help users determine the right hardware platform to cost-effectively satisfy their performance and SWaP requirements. Taking into account the types of neural networks (e.g., AlexNet and MobileNet), batch size, and other inputs, ADLINK's profiling tool models the performance of computing platforms. The tool runs these inputs against a large database of AI and deep learning accelerators, and generates statistics, such as inferences per second; performance per watt; and performance per dollar, for popular neural networks.

Why ADLINK

The ADLINK DLAP Series gives system developers the flexibility they need to cost-effectively achieve the right mix of SWaP and AI performance. They can choose from a wide variety of CPUs, GPU modules and cards, form factors, and power consumption ranges to satisfy their specific application requirements. DLAP is designed for the embedded market, meaning the products are compact, industrial-grade, thermally-optimized, and supported with an extended lifecycle. With the DLAP series, there is no need to buy a server to run AI inferencing, facial recognition, object detection, or other AI-based applications at the edge.

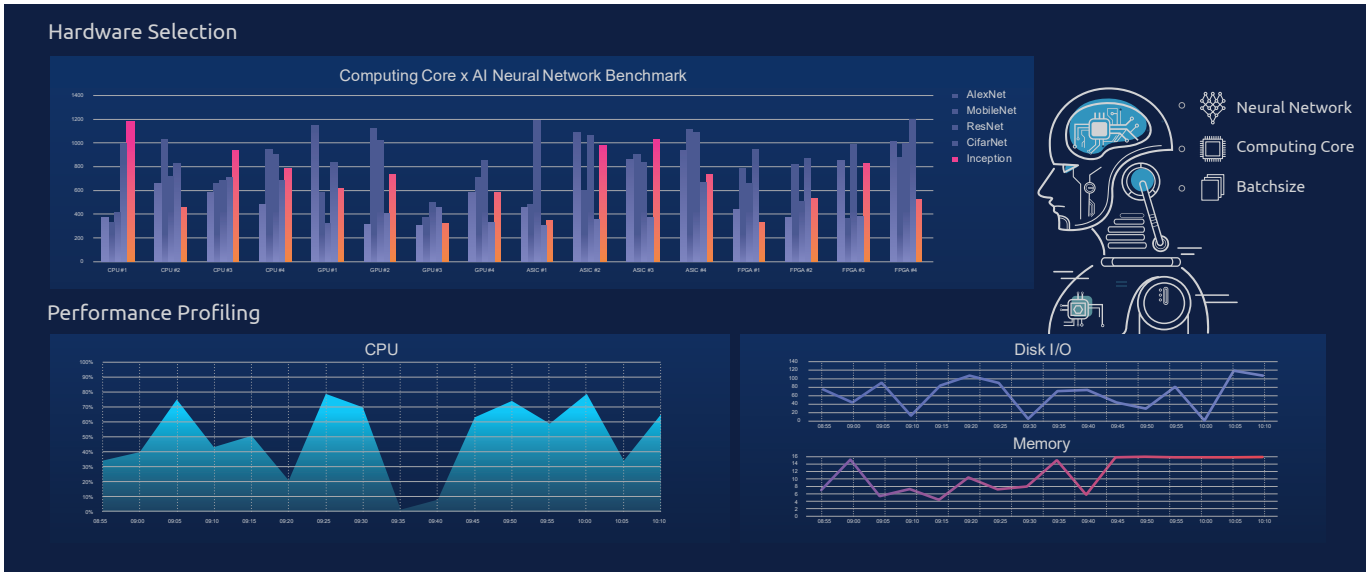


Figure 2. Deep Learning Consultancy Service

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