AIVAS SuperWorkstation Product Overview

Introducing AIVAS, the world's first generative AI all-in-one high-performance personal computer! Architected from the ground up as the most powerful and easy to use massively-parallel heterogenous compute system. AIVAS has been designed to solve the most difficult and large-scale data intensive scientific problems. Packing the equivalent of two full cloud native instances, AIVAS provides a seamless on-ramp and developer platform to any supercomputing cluster, cloud or Arm environment. Leveraging 256 advanced single-instruction, multiple-data (SIMD) CPU vectorization engines and Quad-GPUs. Developers can efficiently execute both the sequential control-intensive and data-parallel phases code of any application. All while executing instructions to access memory and process data in parallel over a larger set of vectors with a unified memory architecture. Gaining 33X compounded performance increase of over state of the art comparable systems. With over 1,000 TOPS of compute or over one Quadrillion of Operations per Second. AGI is going to love AIVAS!

Product Hardware Features

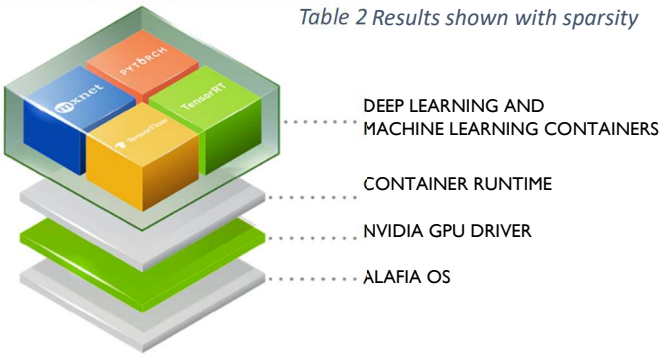
Feature	Description
Processor	Ampere® Altra Max 128 ARM v8.2+ 64-bit CPU Cores up to 3.0 GHz
Graphics	NVIDIA RTX ® Ada Architecture Graphics Card GPU with 20GB GDDR6 error-correction code (ECC) memory
AI Accelerator	(3) NVIDIA Tesla Ada Architecture Tensor Core GPUs with 72GB GDDR6 error-correction code (ECC) memory
Display	27" UHD (3840 x 2160) IPS, anti-glare, touchscreen, 360 nits integrated display 99% Adobe RGB | DCI-P3 99% color gamut/space for crisp, realistic imagery
Color	Cloud Grey and Semi-Gloss Cardinal White
Expansion Internal I/O	4 SlimSAS (PCIe 4.0 x8 lanes) | 2 OCuLink (PCIe 4.0 x4 lanes)
Side ports	USB-C 3.2 | USB-A 3.2 Gen | Microphone / headphone combo
Rear I/O	(2) USB 3.2 Ports | (1) HDMI | (1) miniDP | (1) DisplayPort | (4) Ethernet RJ-45 ports
Audio	2 x 5W stereo speaker | JBL® by Harman ® certified
Memory	2TB error-correction code (ECC) DDR4 RDIMMs 3200 MHz
Camera	USB-C Detachable 5MP IR Camera
Storage	8TB Gen4 PCIe 4.0 x4 NVMe (1M+ IOPS) | Expandable up to 72TB NVMe Storage Up to 7,000 MB/s Sequential Read and 6,100 MB/s Write Speeds
Networking	(2) Intel X550 RJ45 (10GbE) | (1) Intel i210 RJ45 (1GbE)
BMC	IPMI Dedicated RJ45 Realtek RTL8211E
Connectivity	WiFi 7 802.11BE (2 x 2) 5.8 Gbps Max Speed | 2.4, 5, 6 GHz Bands | Bluetooth® 5.4
Power	700 Watts
Dimensions (H x W x D)	24" x 18" x 11" Landscape Mode | 26.5" x 14.5" x 11 Portrait Mode
Weight	20 Kg

contact@alafia.ai | www.alafia.ai

Compute Performance

Data Structure	Performance Throughput
FP32	125 TFLOPs
TF32	480 TFLOPs
FP16	1,024 TFLOPs
BFLOAT16	968 TFLOPs
FP8	2,048 TFLOPs
INT8	2,048 TFLOPs
CUDA GPU Cores	28,416
GPU memory	92 GB GDDR6 ECC
GPU memory bandwidth	320 GB/s

Table 2 Results shown with sparsity



AI Inference Performance

Model Architecture	Inferences per Second
ResNet-50 v1.5 (Image Classification)	52,582
BERT large (Natural Language Processing)	2,591
DLRM v2 (Recommender Systems)	889,909

Table 1 Benchmarked with the Ampere Model Library and MLPerf ™ inference

Software Overview

Fully optimized and high-performance improved software stack	
Operating System	ALAFIA OS 24.04 LTS
Linux Kernel	6.8.0-11-AARCH64-64K
GPU Driver	NVIDIA ARM64 550.67
Machine Learning Frameworks	PyTorch 2.2.1 Optimized Inference Container
	NVIDIA CUDA Toolkit 12.4.0
	NVIDIA cuDNN 9.0.0
	NVIDIA TensorRT 10.0.0

Security and Privacy Features

Support for state-of-the-art encryption and platform security	
Component Level Secure Boot & Root of Trust	• SMpro and PMpro processors • Full disk encryption • Secure firmware upgrade • Firmware rollback protection
Platform Level Trusted Computing	• TPM Module support • SHA-1 PCR Bank | SHA256 PCR Bank • Pending Operation | Platform Hierarchy • Storage Hierarchy | Endorsement Hierarchy
Processor Level Confidential Computing	• Memory isolation through main memory encryption • Trusted execution environments • Physically isolated processors
Operating System Level Privacy Enhancing Technologies	Cryptographic approaches: • Differential privacy | Homomorphic encryption • Secure multiparty computation | Zero-knowledge proofs • Single subscription for security and compliance

contact@alafia.ai | www.alafia.ai

Notice

This document is provided for information purposes only and shall not be regarded as a warranty of a certain functionality, condition, or quality of a product. Alafia Ai, Inc. ("ALAFIA") makes no representations or warranties, expressed or implied, as to the accuracy or completeness of the information contained in this document and assumes no responsibility for any errors contained herein. ALAFIA shall have no liability for the consequences or use of such information or for any infringement of patents or other rights of third parties that may result from its use. This document is not a commitment to develop, release, or deliver any Material (defined below), code, or functionality. ALAFIA reserves the right to make corrections, modifications, enhancements, improvements, and any other changes to this document, at any time without notice.

Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. ALAFIA products are sold subject to the ALAFIA standard terms and conditions of sale supplied at the time of order acknowledgement, unless otherwise agreed in an individual sales agreement signed by authorized representatives of ALAFIA and customer ("Terms of Sale"). ALAFIA hereby expressly objects to applying any customer general terms and conditions with regards to the purchase of the ALAFIA product referenced in this document. No contractual obligations are formed either directly or indirectly by this document ALAFIA products are not designed, authorized, or warranted to be suitable for use in medical diagnostics, medical treatment, military, aircraft, space, or life support equipment, nor in applications where failure or malfunction of the ALAFIA product can reasonably be expected to result in personal injury, death, or property or environmental damage. ALAFIA accepts no liability for inclusion and/or use of ALAFIA products in such equipment or applications and therefore such inclusion and/or use is at customer's own risk.

ALAFIA makes no representation or warranty that products based on this document will be suitable for any specified use. Testing of all parameters of each product is not necessarily performed by ALAFIA. It is customer's sole responsibility to evaluate and determine the applicability of any information contained in this document, ensure the product is suitable and fit for the application planned by customer, and perform the necessary testing for the application in order to avoid a default of the application or the product. Weaknesses in customer's product designs may affect the quality and reliability of the ALAFIA product and may result in additional or different conditions and/or requirements beyond those contained in this document. ALAFIA accepts no liability related to any default, damage, costs, or problem which may be based on or attributable to: (i) the use of the ALAFIA product in any manner that is contrary to this document or (ii) customer product designs.

No license, either expressed or implied, is granted under any ALAFIA patent right, copyright, or other ALAFIA intellectual property right under this document. Information published by ALAFIA regarding third-party products or services does not constitute a license from ALAFIA to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property rights of the third party, or a license from ALAFIA under the patents or other intellectual property rights of ALAFIA.

THIS DOCUMENT AND ALL ALAFIA DESIGN SPECIFICATIONS, CODE, SAMPLE APPLICATIONS, REFERENCE SYSTEMS, FILES, DRAWINGS, DIAGNOSTICS, LISTS, AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." ALAFIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY, OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE. TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL ALAFIA BE LIABLE FOR ANY DAMAGES, INCLUDING WITHOUT LIMITATION ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES, HOWEVER CAUSED AND REGARDLESS OF THE THEORY OF LIABILITY, ARISING OUT OF ANY USE OF THIS DOCUMENT, EVEN IF ALAFIA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Notwithstanding any damages that customer might incur for any reason whatsoever, ALAFIA's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms of Sale for the product.

Trademarks

ALAFIA, the ALAFIA ("brain") logo, ALAFIA Applications, AIVAS and ALAFIA AIVAS SuperWorkstation are trademarks and/or registered trademarks of Alafia Ai, Inc. in the U.S. and other countries. Ampere is registered trademark of Ampere Computing. Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere. All other trademarks are the property of their respective holders.

Copyright