Benchmark of AMD Ryzen 9 7950 and NVIDIA RTX 4080

This is a report of benchmarks we ran on a desktop equipped with AMD Ryzen 9 7950x and NVIDIA RTX 4080.
The complete PC specifications can be found below.

The specification of these computers are:

- CPU - AMD Ryzen 9 7950x
- CPU Cooler – Arctic Liquid Freezer II 420
- Motherboard – Asrock x670E PG Lightning
- SSD – Seagate Firecuda 530 SSD 1TB M.2 NVMe
- HDD – Seagate Ironwolf 8TB
- GPU – Manli GeForce RTX 4090 24GB | Gigabyte Geforce RTX 4080 16GB Eagle OC
- PC Case – Lian Li Lancool III
- PSU – Corsair HX Series HX1200
- RAM – Kingston Fury Beast 64GB DDR5 4800MHz
- Software – Ubuntu 22.04 LTS

CPU Benchmarks

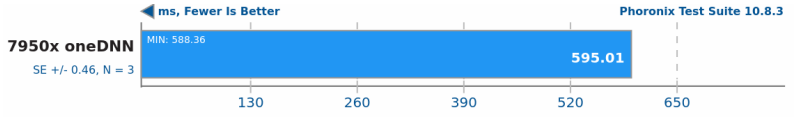
oneDNN 3.0

This is a test of the Intel oneDNN as an Intel-optimized library for Deep Neural Networks and making use of its built-in benchdnn functionality. The result is the total perf time reported. Intel oneDNN was formerly known as DNNL (Deep Neural Network Library) and MKL-DNN before being rebranded as part of the Intel oneAPI toolkit.

Settings:

Harness: Recurrent Neural Network Inference - Data Type: bf16bf16bf16 - Engine: CPU

Benchmark Results



Benchmark results from other users that can be found here

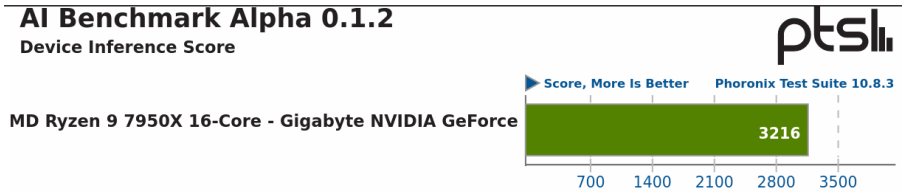
COMPONENT	PERCENTILE RANK	# COMPATIBLE PUBLIC RESULTS	MS (AVERAGE)
2 x Intel Xeon Platinum 8280	99th	4	464 +/- 4
2 x Intel Xeon Platinum 8380	96th	3	484 +/- 21
Intel Xeon Platinum 8490H	95th	4	491 +/- 9
AMD Ryzen 9 7950X 16-Core	92nd	7	581 +/- 6
2 x Intel Xeon Gold 5220R	87th	3	806 +/- 5
AMD Ryzen 9 7900 12-Core	84th	10	845 +/- 11
Mid-Tier	75th		> 892
Intel Core i9-10980XE	73rd	3	929 +/- 1
Intel Core i9-13900K	71st	3	1088 +/- 7
AMD Ryzen 7 7700 8-Core	68th	13	1146 +/- 16
AMD Ryzen Threadripper 3990X 64-Core	60th	3	1314 +/- 45
2 x AMD EPYC 7773X 64-Core	57th	4	1374 +/- 86
AMD Ryzen Threadripper 3960X 24-Core	55th	4	1402 +/- 46
Median	50th		1448
AMD Ryzen 5 7600 6-Core	50th	14	1449 +/- 4

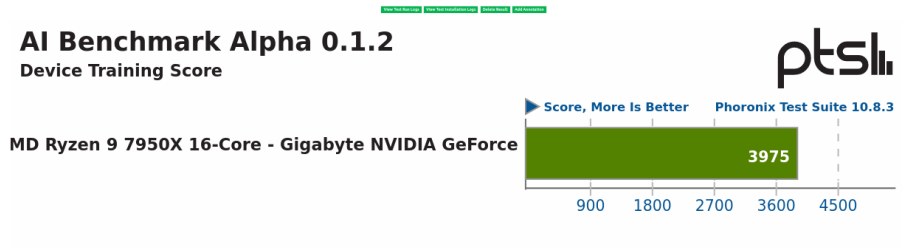
We noticed that our computer scored better than the average benchmark from other users using the same CPU (Ryzen 9 7950x). This may be due to setting the CPU scaling governor to performance with the use of this tool https://github.com/vagnum08/cpupower-gui

AI Benchmark Alpha

AI Benchmark Alpha is a Python library for evaluating artificial intelligence (AI) performance on diverse hardware platforms and relies upon the TensorFlow machine learning library.

Benchmark Results





Benchmark results from other users that can be found here

Device Inference score

COMPONENT	PERCENTILE RANK	# COMPATIBLE PUBLIC RESULTS	SCORE (AVERAGE)
AMD Ryzen 9 7950X 16-Core	99th	8	3285 +/- 157
AMD Ryzen 9 7900X 12-Core	99th	7	2855 +/- 3
AMD EPYC 75F3 32-Core	98th	6	2434 +/- 39
AMD EPYC 7543 32-Core	96th	3	2309 +/- 18

Device AI score

COMPONENT	PERCENTILE RANK	# COMPATIBLE PUBLIC RESULTS	SCORE (AVERAGE)
AMD Ryzen 9 7950X 16-Core	99th	8	7388 +/- 294
AMD Ryzen 9 7900X 12-Core	99th	7	6548 +/- 2
AMD Ryzen 7 7700X 8-Core	97th	11	5356 +/- 536
Intel Core i9-13900K	97th	14	5221 +/- 503

Device training score

COMPONENT	PERCENTILE RANK	# COMPATIBLE PUBLIC RESULTS	SCORE (AVERAGE)
AMD Ryzen 9 7950X 16-Core	99th	8	4103 +/- 138
AMD Ryzen 9 7900X 12-Core	99th	7	3692 +/- 3
Intel Core i9-13900K	98th	14	3289 +/- 348
AMD Ryzen 7 7700X 8-Core	97th	11	3203 +/- 40

GPU Benchmarks

Nvidia driver version: 525.78.01
CUDA version: 12.0.133

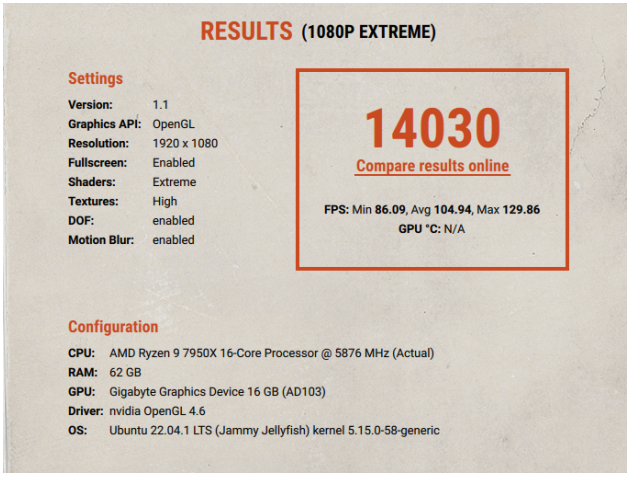
Unigine Superposition v1.1

Unigine Superposition is an extreme performance and stability test for PC hardware: video card, power supply, cooling system. This is the list of the user benchmarks on extreme settings where on the top right you can search for the specific Graphics card.

Settings:

Resolution - 1920 x 1080 | Renderer - OpenGL | Extreme settings

Benchmark Result



We noticed that our result was ~10% worse (14030) than the last user benchmark (15364). We assume that the decrease in performance in our graphics card is due to the overclock settings that users used in https://benchmark.unigine.com/leaderboards/superposition/1.x/1080p-extreme/single-gpu/page-1. However, the decrease in performance may be due to the fact that we use 525.78.01 NVIDIA driver version while the newest driver is 525.85.05.

Comparison with other Graphics cards

Since RTX 4080 is a new graphics card, we could not find many benchmarks using the same GPU but we ran more benchmarks to check our system's stability and compare its performance with other similar graphics cards. These are the results we gathered.

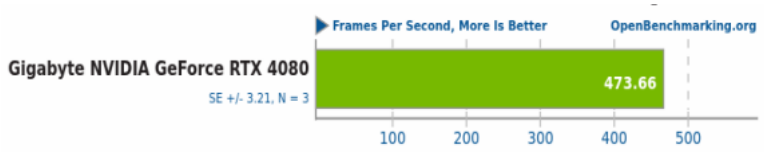
Unigine Heaven 4.0

Unigine Heaven 4.0 test calculates the average frame-rate within the Heaven demo for the Unigine engine. This engine is extremely demanding on the system's graphics card.

Settings:

Resolution: 1920 x 1080 - Mode: Fullscreen - Renderer: OpenGL

Benchmark Results



Benchmark results from other graphics cards

COMPONENT	PERCENTILE RANK	# COMPATIBLE PUBLIC RESULTS	FRAMES PER SECOND (AVERAGE)
ASUS AMD Radeon RX 6900 XT	100th	3	347 +/- 8
AMD Radeon RX 6800 XT	100th	20	338 +/- 32
Gigabyte AMD Radeon RX 6800	100th	8	329 +/- 23
NVIDIA GeForce RTX 3090	99th	24	316 +/- 39
Sapphire AMD Radeon RX 6800	98th	16	278 +/- 18
NVIDIA GeForce RTX 3080	98th	30	275 +/- 28
AMD Radeon RX 6700 XT	96th	20	262 +/- 10
AMD Radeon RX 6750 XT	96th	3	259 +/- 15
NVIDIA GeForce RTX 3070 Ti	96th	13	257 +/- 16
Sapphire AMD Radeon RX 6700 XT	96th	4	256 +/- 6
MSI AMD Radeon RX 6700 XT	95th	4	249 +/- 1
Gigabyte AMD Radeon RX 6700 XT	95th	5	244 +/- 13

We can see that the Gigabyte RTX 4080 had an average of 473.66 Frames per second (FPS) where graphics card such as 6900 XT (AMD's flagship GPU) had an average of 347 FPS. These results can be found here

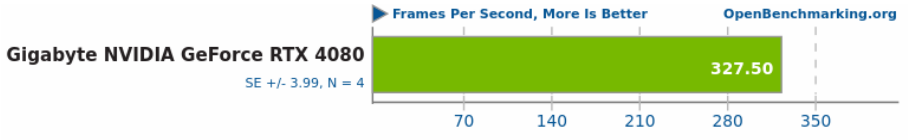
Unigine Valley 1.0

Unigine Valley calculates the average frame-rate within the Valley demo for the Unigine engine. This engine is extremely demanding on the system's graphics card.

Settings:

Resolution: 1920 x 1080 - Mode: Fullscreen - Renderer: OpenGL

Benchmark Results



COMPONENT	PERCENTILE RANK	# COMPATIBLE PUBLIC RESULTS	FRAMES PER SECOND (AVERAGE)
AMD Radeon RX 6700 XT	100th	8	250 +/- 16
Gigabyte AMD Radeon RX 6800	100th	4	250 +/- 18
AMD Radeon RX 6800 XT	99th	7	240 +/- 25
AMD Radeon RX 6700	98th	3	228 +/- 3
AMD Radeon RX 6600 XT	98th	6	226 +/- 9
AMD Radeon RX 6750 XT	97th	3	219 +/- 28
NVIDIA GeForce RTX 3090	97th	15	215 +/- 16
NVIDIA GeForce RTX 3070	93rd	5	192 +/- 10