

What is GPU? Difference between GPU and CPU

GPUs were developed to support and share work with CPUs. So what is GPU? This article by TipsMake will help you answer.

Graphics card, also known as GPU, is a factor that is very important to those who work in the graphics or gaming field. So what is GPU and what are its applications in practice? If you want to learn about GPUs, read TipsMake's article below.

What is GPU?

GPU (Graphics Processing Unit) is the name of the unit that handles graphics-related tasks for the CPU central processor. GPUs contain many features that are many times superior to basic graphics drivers like Intel GPUs.

Picture 1 of What is GPU? Difference between GPU and CPU

What is the main function of GPU

GPUs were developed to support and share work with CPUs. Accordingly, the CPU will control the operating system according to the GPU, while its pulses will handle other tasks on the system. Below are the basic features of GPU:

1. **Support and increase professional image and video performance** in processors such as Adobe Premiere, Camtasia, After Effects.
2. Helps 3D games, computer graphics software such as 3Dmax, Vray, operate smoothly, thereby improving user experience.

Common applications of GPUs are applied in embedded systems, laptops, specialized computers for gamers and workstations.

Normally, GPUs will appear in many laptops. Users can easily check GPU parameters at the graphics card or Mainboard section.

What is the difference between CPU and GPU

Currently, many users are still confused between the two concepts of GPU and **CPU (Central Processing Unit)**. But when it comes to nature, structure, use and effectiveness, they are completely different.

The CPU is considered the central organ responsible for **analyzing and processing** computer data when it is transmitted in command file format. Meanwhile, GPU was born with the task of handling tasks related to data

blocks including images, videos, and graphics. Besides, multi-threaded, parallel and memory information is also supported by the GPU.

Picture 2 of What is GPU? Difference between GPU and CPU

To put it simply, the GPU is just a supporting part of the CPU and is at a lower level than the CPU, an estimate indicates that about 80% of the GPU's Transistors are used for data analysis and are not capable of analyzing data. receive or control the flow of information like a CPU.

GPU is considered the key to opening up many exploitation potentials to help improve graphics processing speed on computers, thereby meeting a variety of user needs. Today, with the rapid development of technology, GPU programming has become much simpler and easier than before. Nvidia and AMD/ATI are some of the famous brands in GPU manufacturing.

Comparison between GPU and VGA (graphics card)

VGA, also known as **the video card**, is responsible for **processing and displaying images** on the computer including: color, resolution, contrast and image quality,. they will be displayed via connection. with screen. Thanks to that, users can operate and communicate with the computer. VGA cards are divided into 2 main types:

1. Onboard cards.
2. Removable card.

The GPU processor is integrated into a separate VGA card, helping to handle visual tasks, improving the computer's performance.

Application of GPU in practice

After understanding the definition of GPU, the following will be the applications of GPU in practice.

1. In the game

The application of GPU in games is most obvious in popular internet rooms, game shops or Cyber ??games that are currently using GPUs. Thanks to that, the games all possess very smooth and realistic images.

In addition, for Streamers, GPU gamers are a tool to help increase the experience of today's very famous games such as PUBG, Call Of Duty,.

Picture 3 of What is GPU? Difference between GPU and CPU

2. In image and video graphics

1. For designers who often have to build and draw images, the GPU's Cuda core will directly affect this process.
2. In making or editing videos, receiving and processing a series of command files from the user is also handled by the GPU.

3. On the other hand, high-end GPUs also support processing and calculation for the Preview feature on 2k or 4k video creators and editors to avoid lag.

3. Artificial intelligence

In addition, in areas such as medical computing, financial models, science, oil and gas exploration, these are items that in the future will be applied artificial intelligence and robots to help solve problems. problem of saving human resources. Accordingly, with its outstanding performance, GPU will be a factor that greatly supports this problem.

The importance of GPU on smartphones

Here are the aspects that make GPUs important for smartphones:

Makes games smoother and runs better

For games with the highest resolution and frame change rate on smartphones, the GPU is responsible for making them smooth and realistic.

Picture 4 of What is GPU? Difference between GPU and CPU

Helps developers create more complex games

Thanks to its outstanding and powerful ability to handle effects and render graphics, a modern GPU will help 3D games become more realistic and high-quality than ever.

How to choose a GPU for your computer

Compared to the CPU headquarters, the GPU will not be as important. However, for users with high requirements such as architects, designers, editors, etc., choosing a suitable GPU is also very important. Below are the criteria you should consider.

Mid-range price

Compared to other components and details of the computer, the graphics card will cost many times higher. But in return, you do not need to change or repair the GPU because its longevity and durability are quite high.

Picture 5 of What is GPU? Difference between GPU and CPU

Therefore, for users who intend to use low-cost GPUs, they should consider it because it will take time to constantly repair and upgrade the card. As mentioned above, you should prioritize choosing GPUs from famous brands such as Nvidia, AMD/ATI,.

In short, the quality will be proportional to the price of the GPU you spend to buy. The higher the cost, the better the quality of the GPU, thereby increasing work performance. Or you can choose to take advantage of GPU discount programs to optimize costs.

Buy graphics cards according to intended use

Most users will be interested in high-quality graphics cards. Depending on the purpose of use, they are classified to meet each user's specific needs.

Currently, graphics cards are extremely diverse in terms of price and brand. These include integrated cards and cards produced to serve gamers, designers, etc.

For games with high graphics such as: Dota 2, League of Legends or Overwatch, graphics cards integrated with GPUs including Nvidia GeForce GTX 1050, AMD Radeon RX 560 are the most reasonable suggestions for you.

Picture 6 of What is GPU? Difference between GPU and CPU

Their price will usually be around 150 USD, this price is considered reasonable for those who need to increase the experience of a game that is not very smooth at high resolution settings.

At a price of about **300 USD**, names such as: **GTX 1060, RX 580** will be suitable choices for users who need to use laptops with high graphics to serve design, programming, and gaming. GTX 1060 and RX 580 can handle medium to high level games well thanks to their smooth operation.

In case users want to upgrade their computer's graphics capabilities, they can consider the names **GTX 1070 or GTX 1070Ti**. These are high-end GPU products priced at around 500 USD.

Famous GPU manufacturers

If you understand the criteria for choosing the right graphics card for your computer, next are the famous GPU manufacturers you can refer to.

1. Adreno Series GPUs

Adreno GPU is owned by Qualcomm, currently it is used for Snapdragon Processor product lines. It is known that Adreno was first known as Imageon and it was developed by the ATI Technologies team and transferred to AMD. Eventually, it was acquired by Qualcomm and renamed Adreno.

Adreno 640B

Launched in 2019, **Adreno 640B** is configured by the manufacturer on Qualcomm Snapdragon 855. Delivering outstanding performance thanks to Adreno 640 including FP16 and FP32 computing units (ALU), said to be 50% more than Adreno 630, while its 7nm FinFET manufacturing process makes it 20% more efficient.

Picture 7 of What is GPU? Difference between GPU and CPU

Adreno 650

Adreno 650 is manufactured based on the 7nm process, providing outstanding processing capabilities, improving 25% performance compared to 'elder' Adreno 640. At the same time, the pixel shader increases clock

speed by 50%. This graphics processing chip was launched on the market at the end of 2019.

Adreno 660

Launched on the market in early 2020, **Adreno 660** is developed based on the 5nm process. Adreno 660 with improved graphics display capabilities up to 35%. In particular, Qualcomm has also confirmed that the energy efficiency of Adreno 660 is increased by 20% compared to previous generations.

2. Mali GPU

The father of **Mali GPU is ARM Holdings**. This is a long-standing brand, founded in 1990 from England, specializing in microprocessor design. Popular with users thanks to its power saving advantages, you can find Mali GPUs on chipsets such as Exynos, MediaTek,.

Below are typical graphics cards from ARM Holdings:

GPU Mali G78 – MP24

Launched in 2020 on HiSilicon Kirin 9000. High-end graphics card Mali G78 – MP24 GPU with 24-core support helps achieve quite high performance scores. Mali G78 – MP24 is integrated for ARM-based SoCs, mainly in Android.

Picture 8 of What is GPU? Difference between GPU and CPU

GPU Mali G78 – MP22

Next is the high-end GPU version Mali-G78 MP22, launched in 2020 with 22 cores operating at a frequency of 650 MHz, providing the ability to display realistic and smooth graphics on mobile devices.

Mali-G78 MP22 is manufactured using a 5 nm process and designed specifically for smartphone chipsets.

GPU Mali G78 – MP14

The high-end graphics card ARM Mali-G78MP14 increases graphics performance by up to 40% thanks to 14 cores. It was announced in 2020 on the Samsung Exynos 2100 (Galaxy S21).

3. PowerVR GPU

PowerVR is designed by Imagination Technologies. Many famous brands today such as Apple, MediaTek, Samsung, Intel, Spreadtrum, also use chipsets from Imagination Technologies. In particular, Apple has used PowerVR GPU for from iPhone to Apple A10 Fusion.

PowerVR GE8320

The PowerVR GE8320 graphics card is integrated by Imagination Technologies for mid-range ARM SoCs. It is equipped in Helio P22 to enhance the average gaming experience on mobile devices for users and belongs to the

Series8XE (GE8xx0) GPU line.

PowerVR Series7XT Plus GPU

PowerVR Series7XT Plus GPU with a 6-core design with the ability to handle graphics up to 50%. In particular, this GPU chip line has been integrated on Apple A10 and announced on iPhone 7, iPhone 7Plus.

What are the frequently asked questions about GPUs?

After understanding all the information about GPUs, TipsMake below will help you answer a few small questions related to GPUs.

Can GPUs replace CPUs?

The answer is no.

GPU's main function is to handle tasks related to images and graphics calculations. However, computers need to process more than that, so at this time, GPUs cannot replace CPUs.

How much GPU capacity is enough?

The capacity of the GPU depends entirely on usage needs and the amount of work the user needs to process on the computer. Specifically as follows:

- Tasks such as modeling and animation: The most reasonable GPU capacity is about 8-10 GB.
- Capacity from 8-16 GB and 24 GB or more for GPU configuration rendering (active).
- Capacity from 6-8 GB for GPU configuration rendering (passive).
- For tasks such as normal video editing, the GPU capacity will be from 6-8 GB and from 8-16 GB for heavy GPU-enabled video editing tasks. In addition, if you have higher performance requirements, you can upgrade the GPU capacity to 16-24 GB.
- For motion design or analysis work: A reasonable capacity will be 8-10 GB for a good level of performance and 10-24 GB to achieve the highest performance.
- 4-6 GB is an appropriate GPU capacity for basic graphic design tasks.

In addition, the capacity of the GPU also greatly affects the user's gaming experience. The most noticeable factors include: Loading time, image quality. Accordingly:

- If your game has 720p resolution, the GPU capacity is about 2GB.
- Games with 1080p resolution have a reasonable capacity of about 4 – 6GB.
- 6 – 8 GB VRAM for 1440p games and 10 GB or more for games with 4K image display.

From there, it can be seen that if the GPU has a capacity of 4 - 8GB, users can freely play games with high FPS. However, to avoid constant updates because these games are constantly developing, you should invest in a GPU with a capacity of 12GB.

Epilogue

Above is all the information to help you answer the question what is GPU. At the same time, TipsMake has also provided you with knowledge surrounding GPUs. Hopefully after reading the article you can choose the right GPU.

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