Nvidia Titan RTX

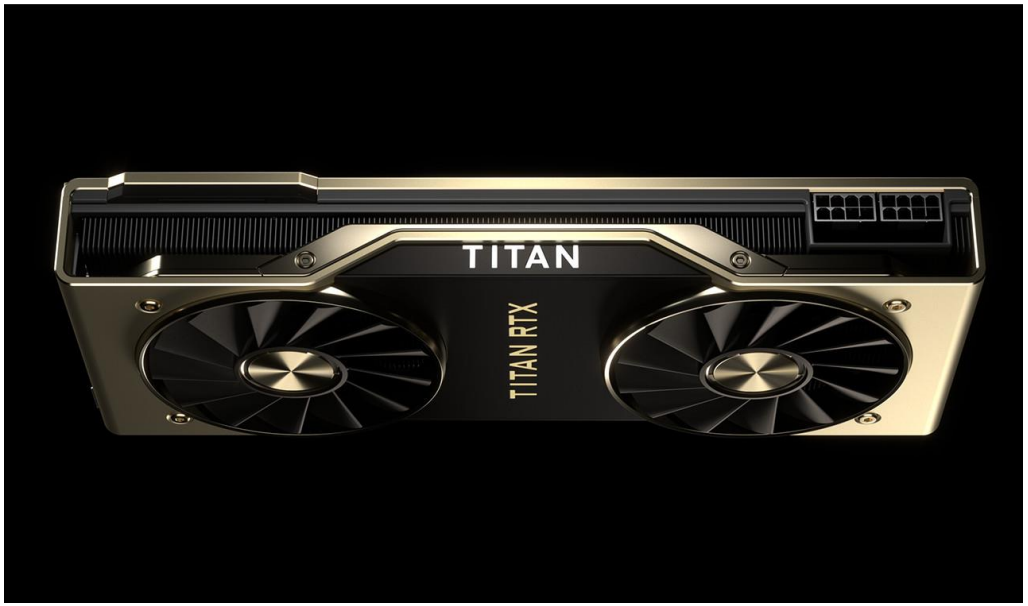
Electrical Engineering Department

Student ID: 110061635

Name : 王瑞賢

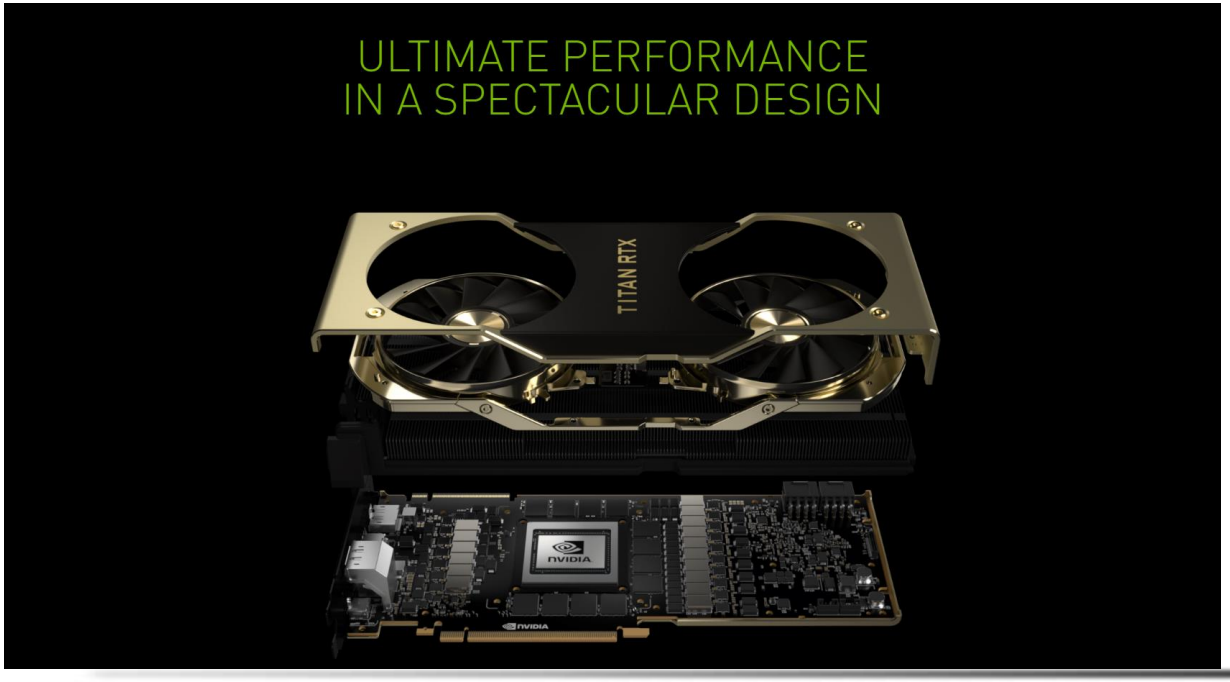
Outline

- **Introduction**
- Nvidia Titan RTX Spec
- Technology Analysis
- Applications
- Conclusion
- References



Introduction

- **Breakthrough PC Performance for Developers and Creators**
  - NVIDIA TITAN RTX is the ultimate PC GPU for the world's most demanding users—AI researchers, data scientists, and content creators.



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Nvidia Titan RTX Spec

1. FAN

Dual 13-blade fans produce 3X higher airflow and ultra-quiet acoustics.

2. TITAN RTX NVLINKTM Bridge

Double the effective GPU memory capacity to 48 GB and scale performance up to 100 GB/s in total data transfer bandwidth utilizing the NVIDIA NVLink™ technology.

3. NVIDIA TURING CPU

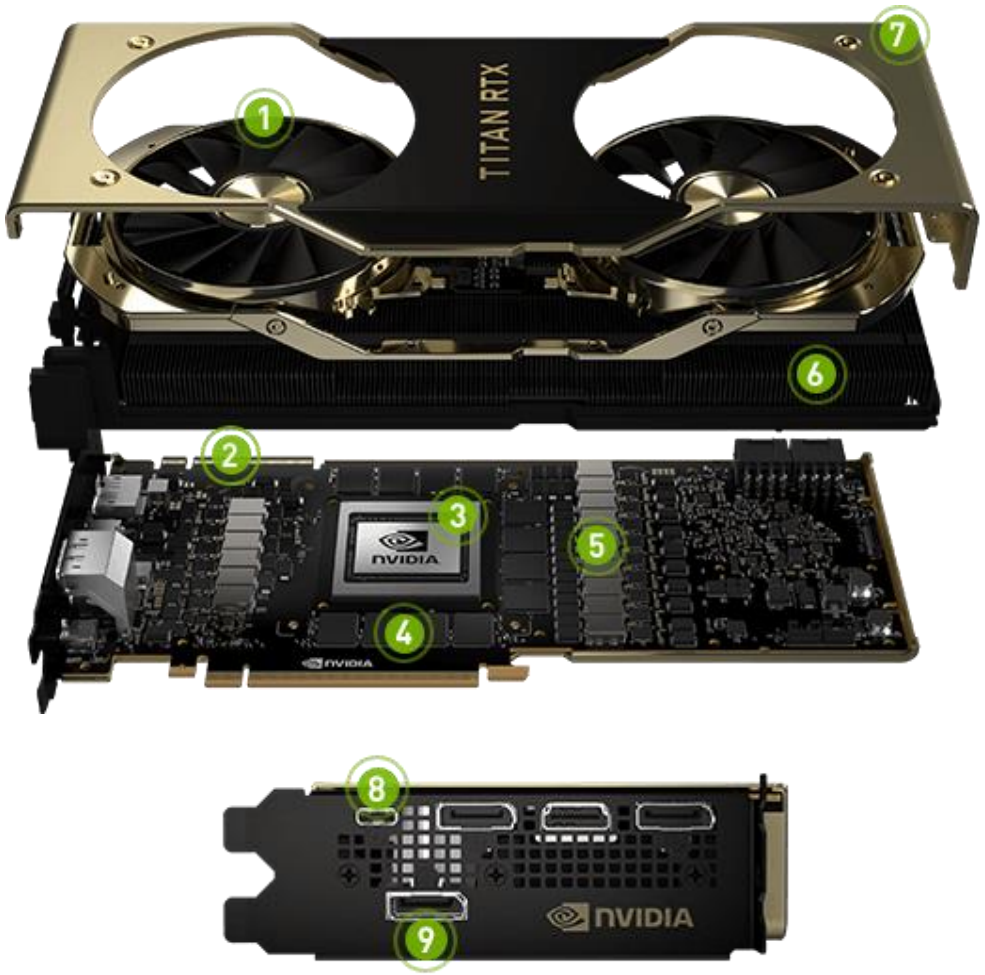
TITAN RTX accelerates photorealistic ray-tracing with 72 RT Cores, AI workflows with 576 Tensor Cores, and parallel computing with 4608 NVIDIA CUDA® cores for developers, researchers, creators, and enthusiasts.

4. GDDR6 MEMORY

24 GB of ultra-fast GDDR6 memory provides up to 672 GB/s of memory bandwidth for greater throughput and to handle larger datasets.

5. POWER SUPPLY

The all-new 13-phase iMON DrMOS power supply delivers more headroom and sub-millisecond power management for maximum overclocking.



Nvidia Titan RTX Spec

6. VAPOR CHAMBER

This full-card vapor chamber is 2X larger to maximize heat spreading and heat transfer to the fin stack.

7. COVER

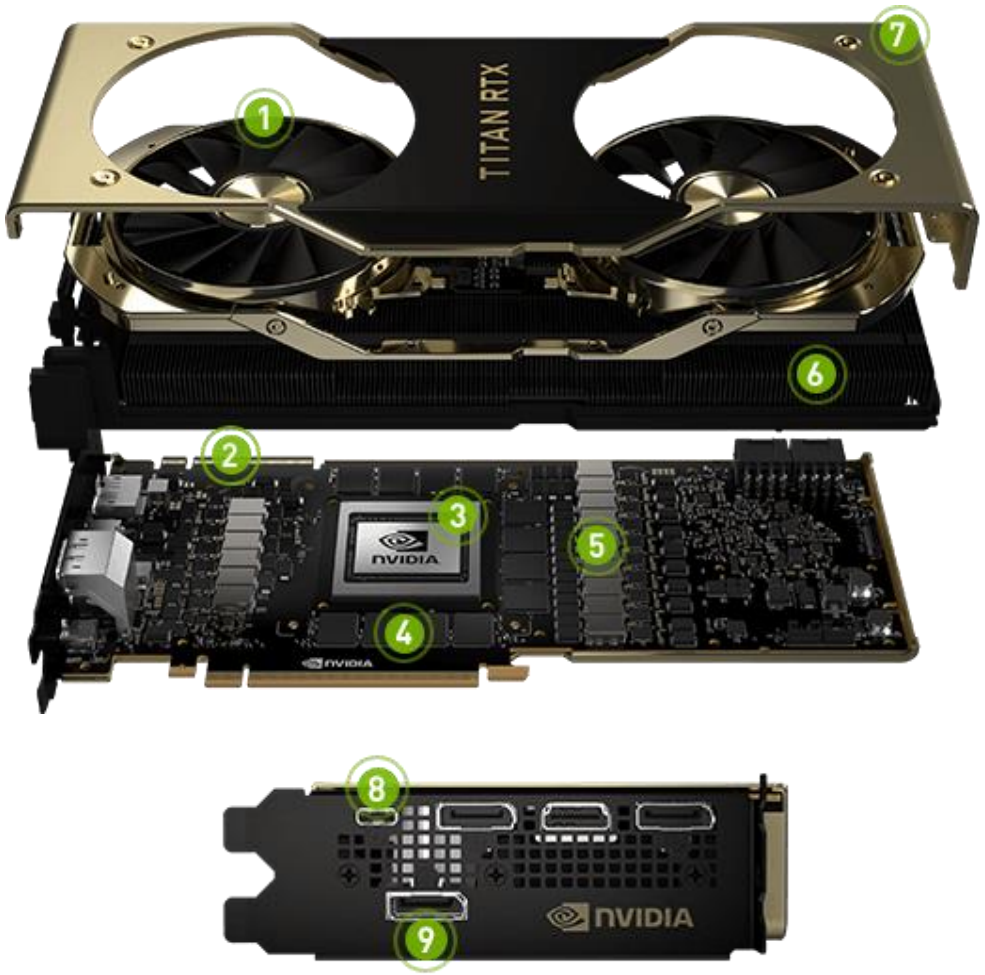
A forged and machine-finished diecast aluminum cover with diamond-cut edge detailing provides a rigid, lightweight frame for an open design with beautifully smooth, continuous curves.

8. VIRTUALLINK

The VirtualLink™* connector simplifies connectivity by meeting the power, display, and bandwidth demands of the next-gen HMD devices to support more immersive experiences.

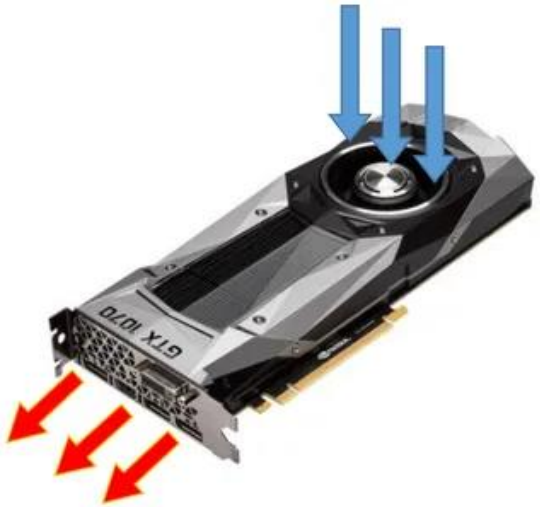
9. DISPLAY PORT 1.4 8K @60 Hz

Drive ultra-high resolutions of up to 8K @ 60 Hz from a single link.



Nvidia Titan RTX Spec

- 1. FAN

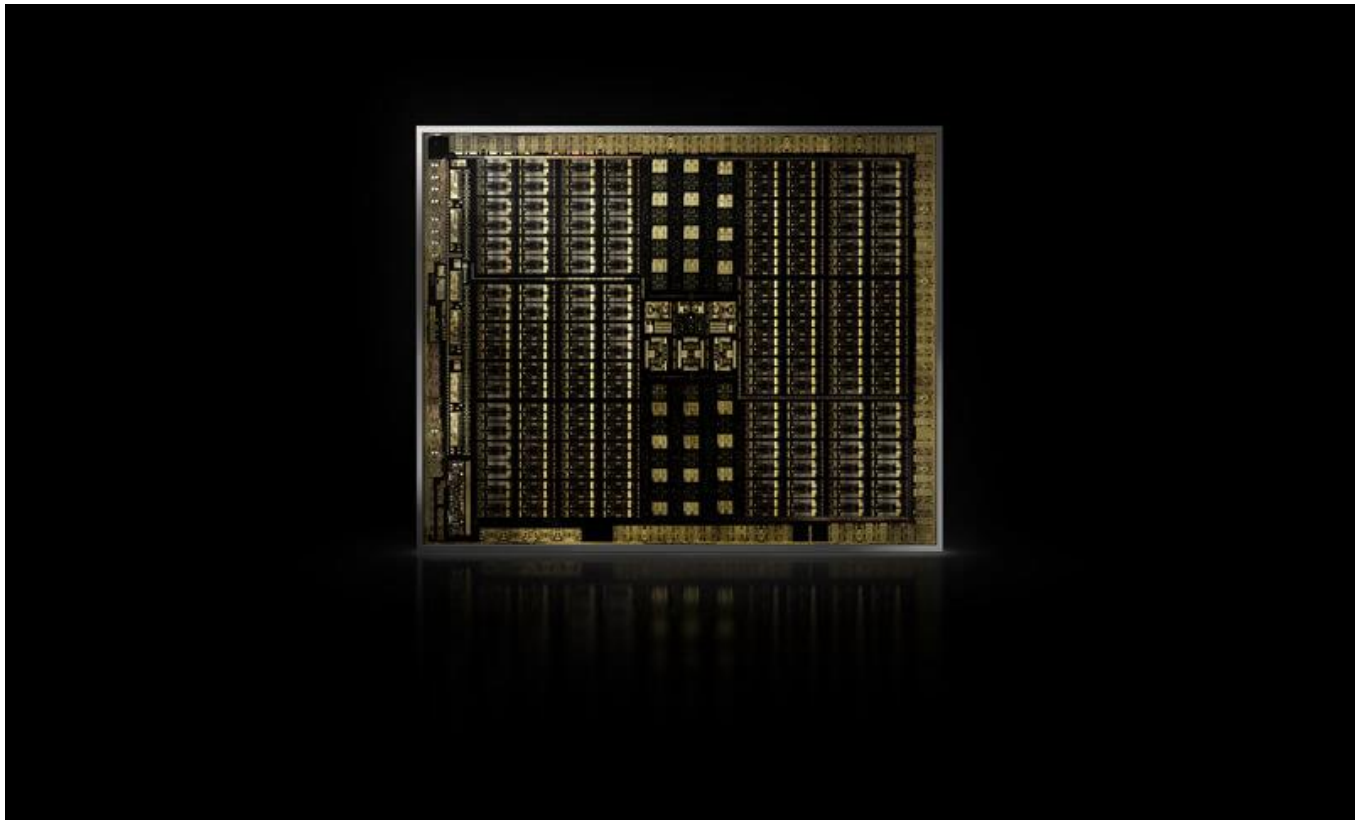


Nvidia Titan RTX Spec

- 2. TITAN RTX NVLINKTM Bridge

Nvidia Titan RTX Spec

- 3. NVIDIA TURING CPU



Nvidia Titan RTX Spec

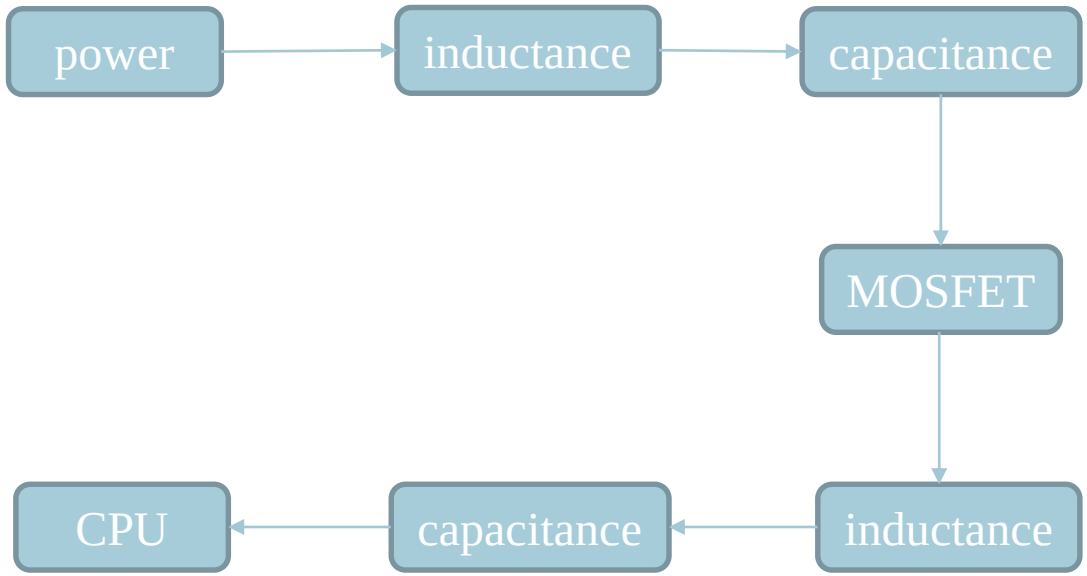
4. GDDR6 MEMORY

(Graphics Double Data Rate, version 6)

Features / Particulars	GDDR5/5X	GDDR6
Manufacturer	Samsung, Micron, and Hynix	Samsung, Micron, and Hynix
Sizes available	512 MB, 1 GB, 2 GB, 4 GB and 8 GB	8 GB and 16 GB
Transfer Speeds	8 Gbps for GDDR5 10 to 12 Gbps for GDDR5X	14 Gbps to 16 Gbps
Power Consumption	High	Low
Power Drawn	1.5 V	1.3 V

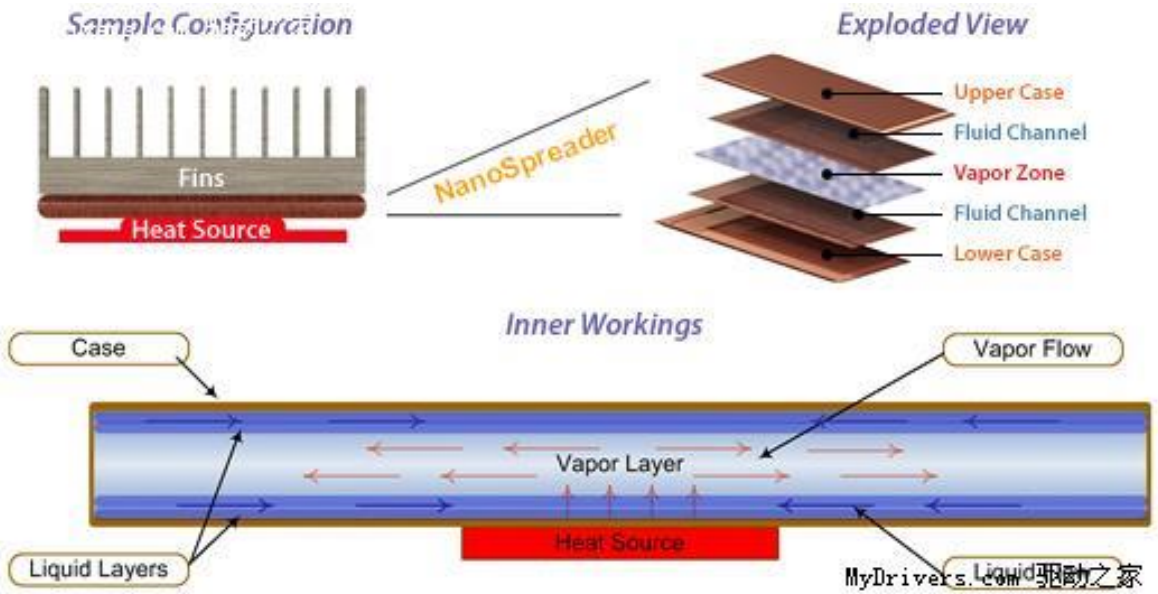
Nvidia Titan RTX Spec

- 5. POWER SUPPLY



Nvidia Titan RTX Spec

- 6. VAPOR CHAMBER



Nvidia Titan RTX Spec

- 7. COVER

Titan RTX

Titan V

Nvidia Titan RTX Spec

- 8. VIRTUALLINK

Nvidia Titan RTX Spec

- 9. DISPLAY PORT 1.4 8K @60 Hz

DisplayPort

HDMI

	bandwidth	resolution
DisplayPort 1.4	32.4 Gbps	up to 8K@60Hz
HDMI 2.0	18 Gbps	up to 8K@30Hz

resolution	refresh rate (Hz)	HDMI 2.0	DisplayPort 1.4
1440p	165	Yes	Yes
1440p	240	No	Yes
4k	60	Yes	Yes
4k	120	no	Yes

Spec comparison

Titan RTX	
Architecture	NVIDIA Turing
Maximum RAM amount	24 GB
Boost Clock	1770 MHz
TDP	280W
CUDA Cores	4608

Titan V	
Architecture	Volta
Maximum RAM amount	12 GB
Boost Clock	1455 MHz
TDP	250W
CUDA Cores	5120

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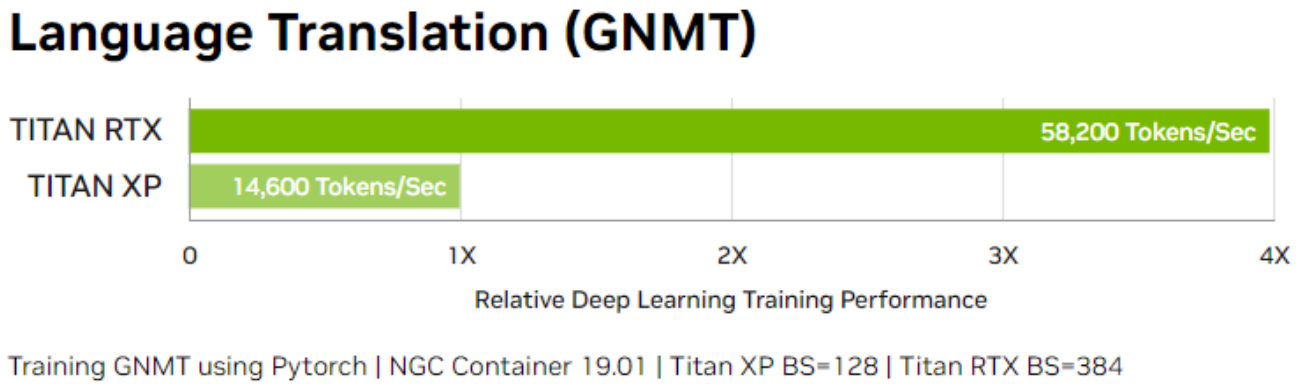
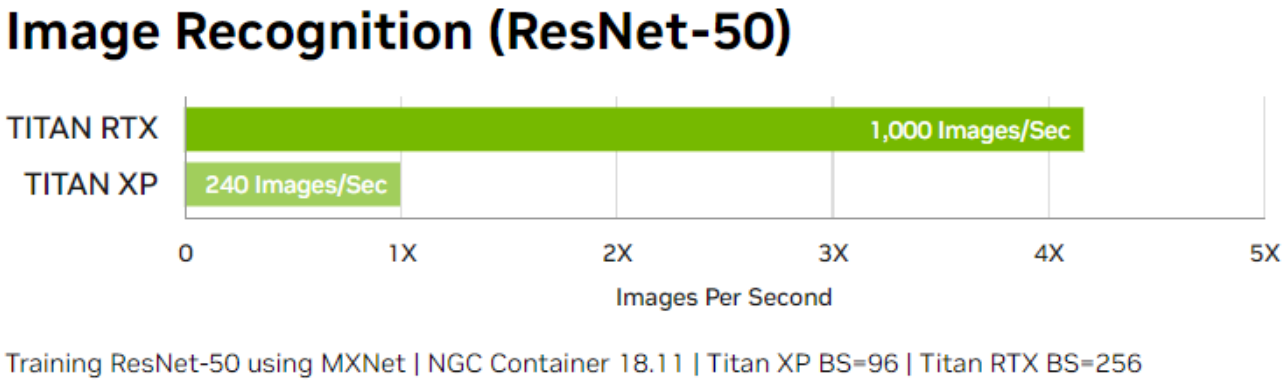
Applications

- **Deep learning**

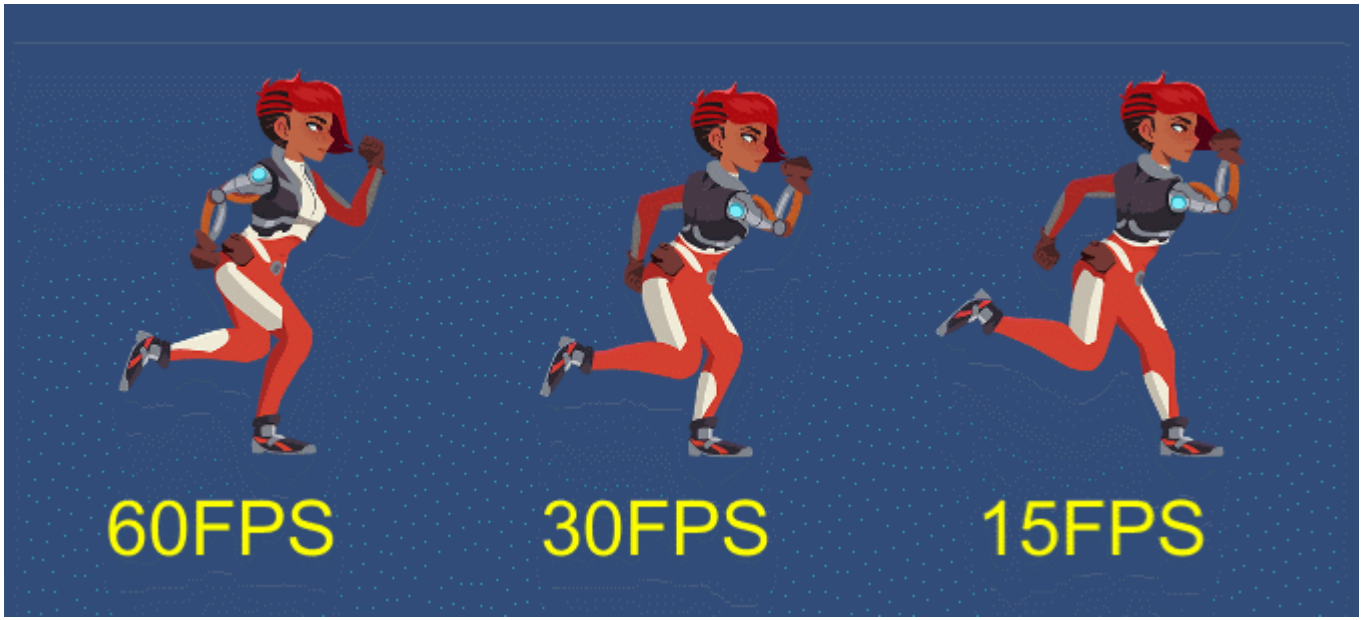




Applications

- **Gaming**

FPS(Frame Per Second)



Applications

Gaming

PLAYERUNKNOWN'S BATTLEGROUNDS	Titan RTX	Titan V
high / 1080p	150–160	140–150
ultra / 1080p	120–130	110–120
4K / 2160p	18–20	18–20
low / 720p	170–180	160–170
medium / 1080p	170–180	160–170

The average gaming FPS of TITAN RTX in PLAYERUNKNOWN'S BATTLEGROUNDS is 6% more, than TITAN V.

Applications

Gaming

Cyberpunk 2077	Titan RTX	Titan V
low / 768p	70–75	70–75
medium / 1080p	50–55	50–55

TITAN RTX and TITAN V have the same average FPS in Cyberpunk 2077.

Applications

- **Gaming**
  - Ray tracing

RTX off

RTX on

Applications

- **Gaming**
  - Ray tracing

RTX off

RTX on

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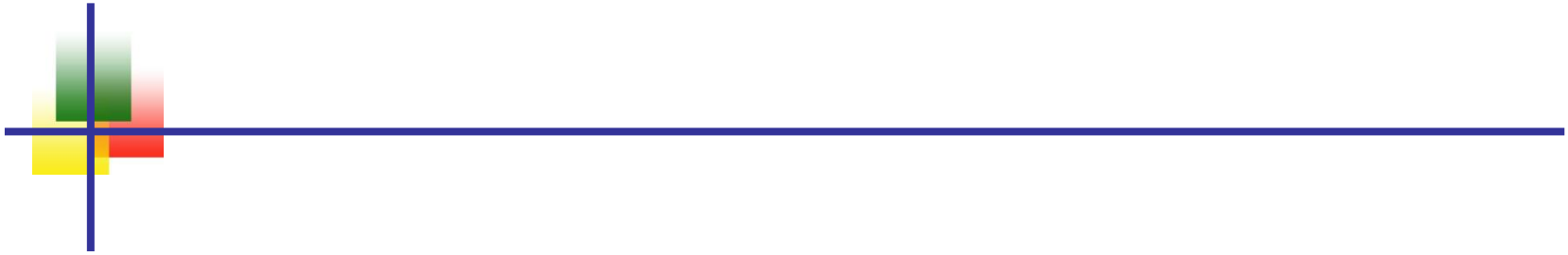
Conclusion

- **Pros**
  - First time using ray tracing
  - Best performance in that era
- **Cons**
  - Performance improvement not obvious
  - Price too high

References

- https://www.nvidia.com/content/dam/en-zz/Solutions/titan/documents/titan-rtx-for-creators-us-nvidia-1011126-r6-web.pdf
- https://www.nvidia.com/en-us/deep-learning-ai/products/titan-rtx/
- https://www.velocitymicro.com/titanrtx.php



Thank you!