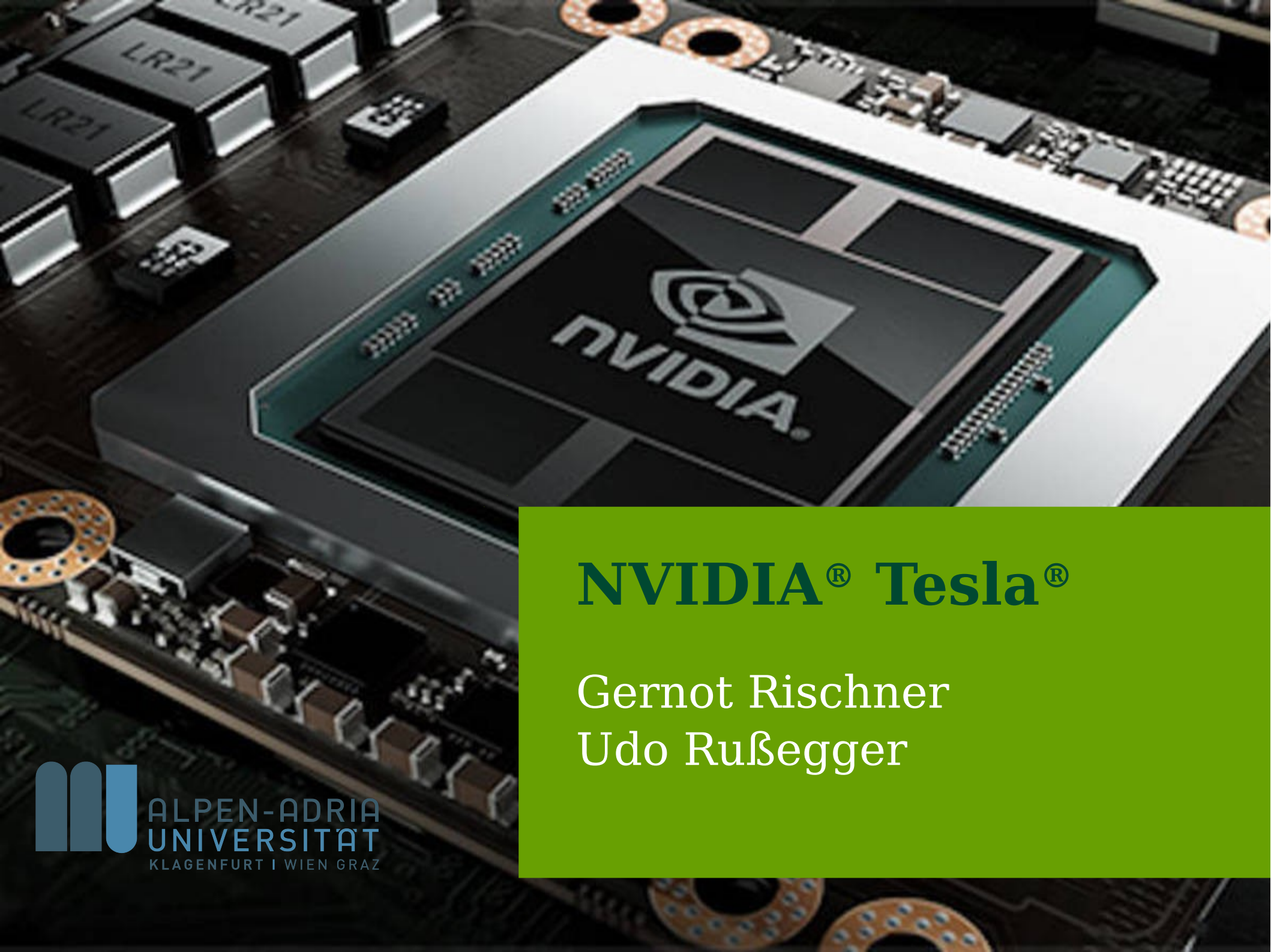


NVIDIA® Tesla®

Gernot Rischner
Udo Rußegger

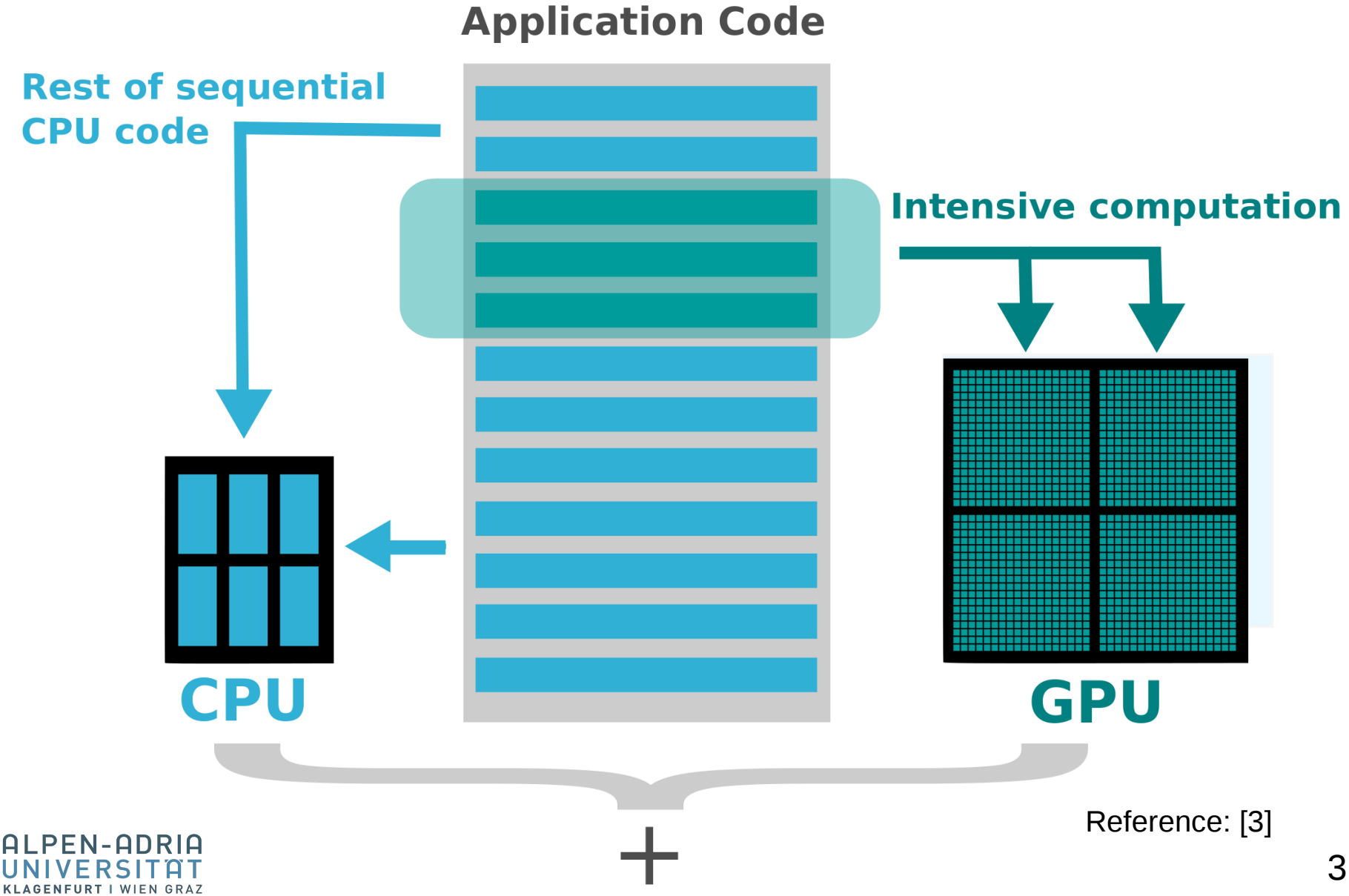
ALPEN-ADRIA
UNIVERSITÄT
KLAGENFURT | WIEN GRAZ

What Is NVIDIA® Tesla® ?

- Designs GPUs (graphic processing units)

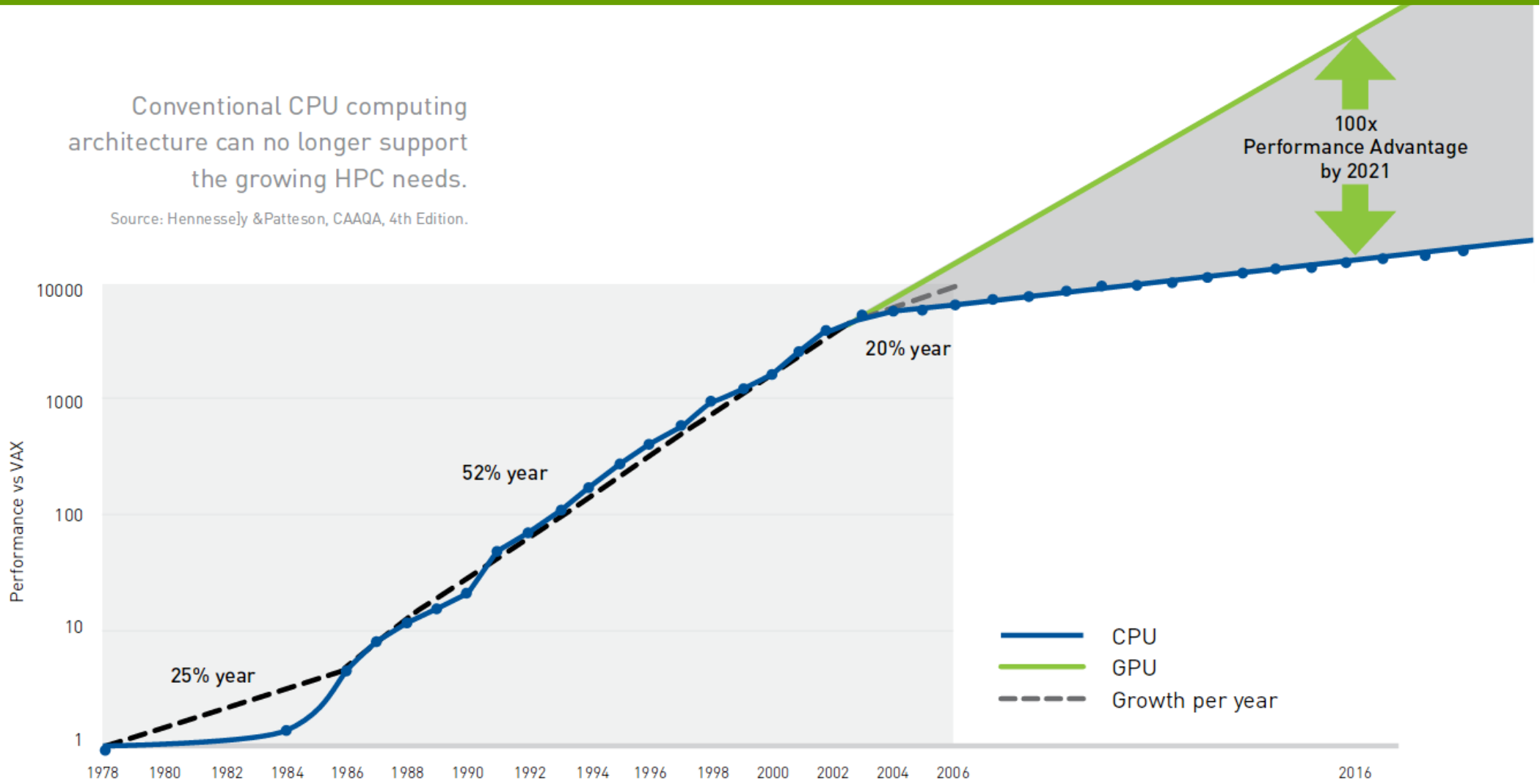
- GPU produced by NVIDIA
  - GPGPU computing (general purpose graphics processing unit)
  - Designed for large-scale parallel computer

How Does GPU Acceleration Work?



Reference: [3]

The GPU – CPU Gap (by NVIDIA®)

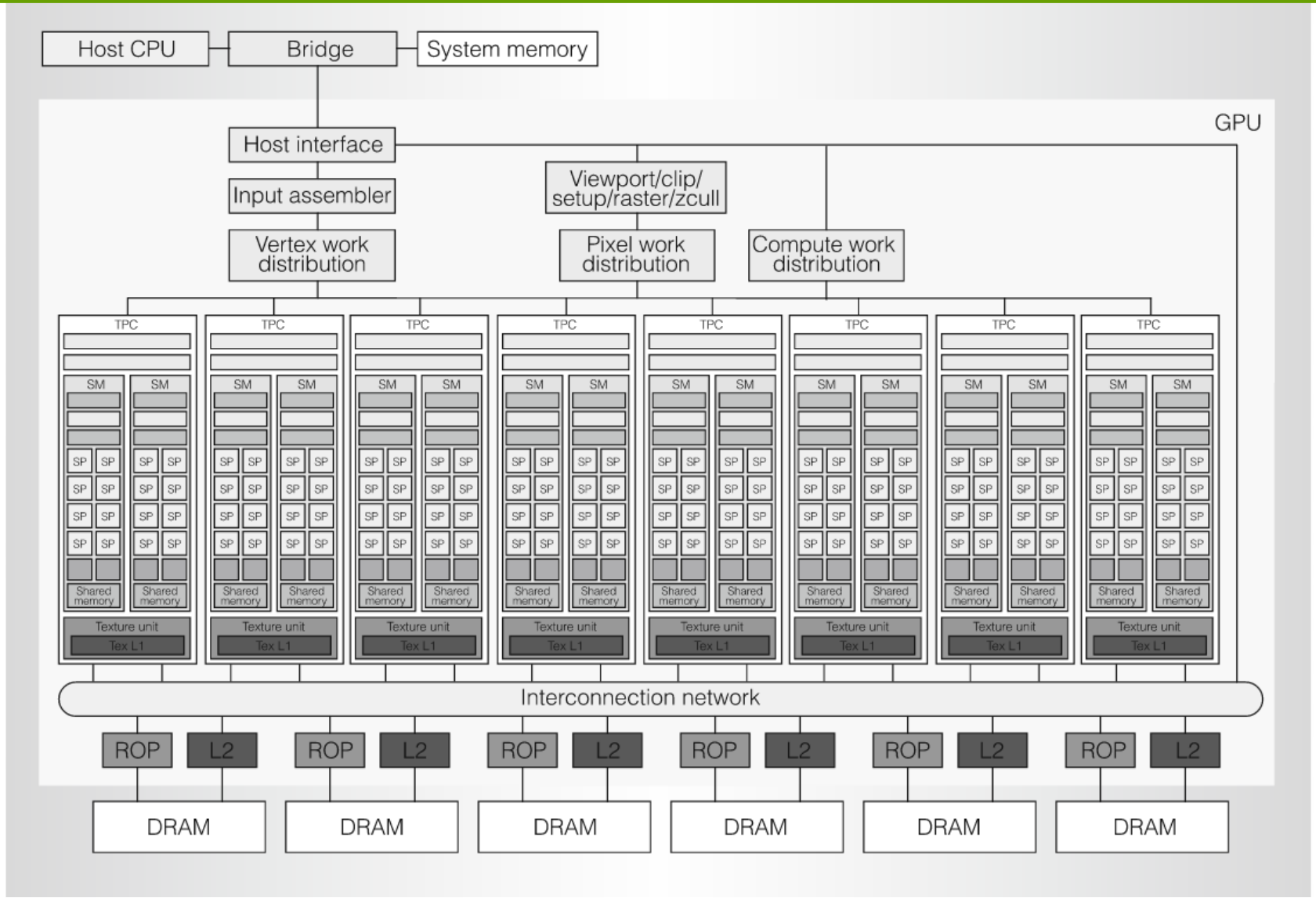


Reference: [4]

GPU Hardware Roadmap

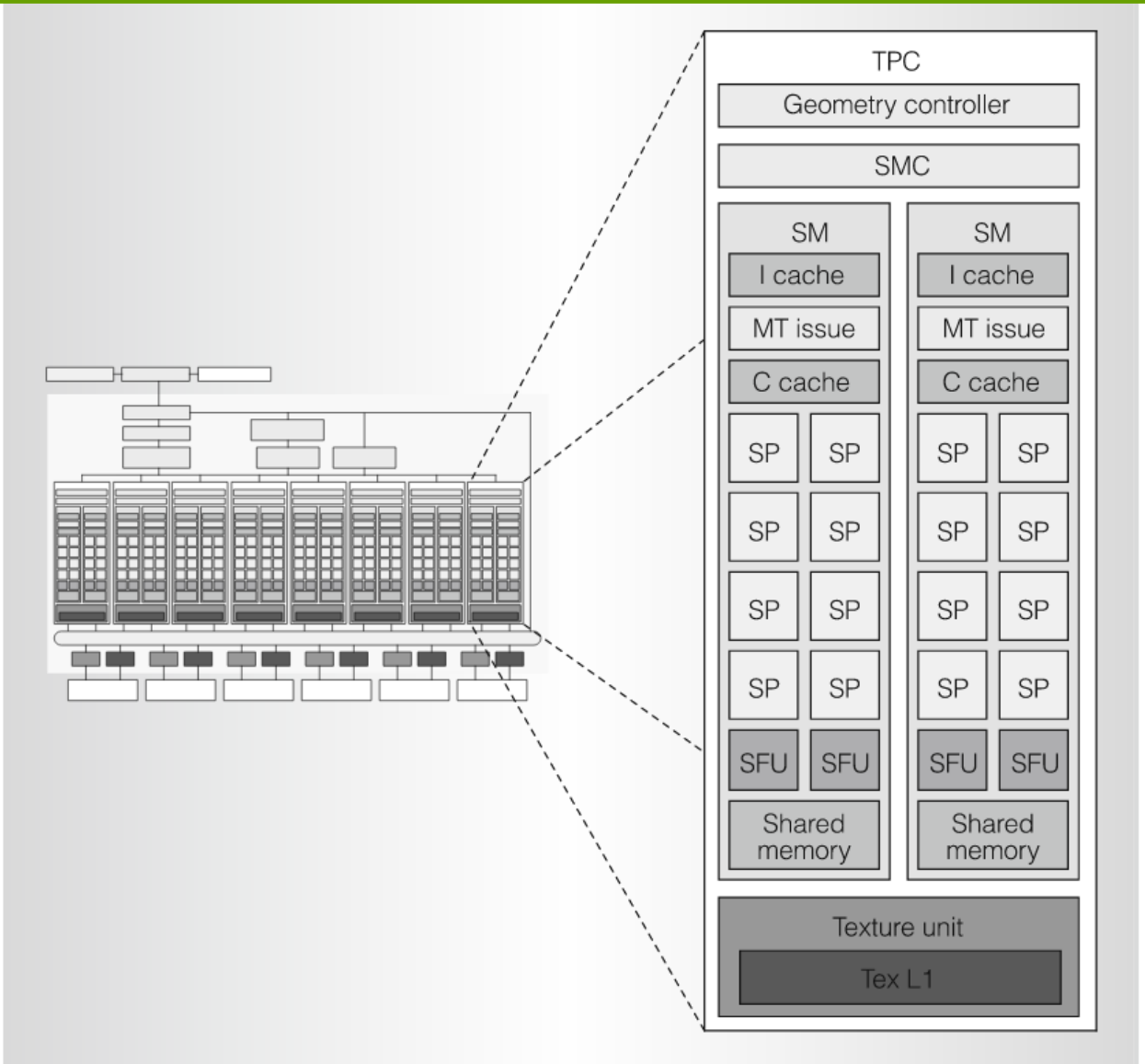
Reference: [6]

NVIDIA® Tesla® Architecture (1/2)



Reference: [1]

NVIDIA® Tesla® Architecture (2/2)



Reference: [1]

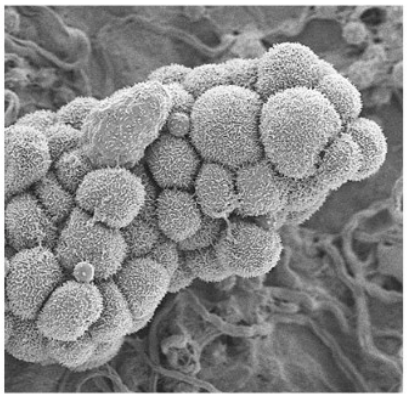
Specifications: Then vs. Now

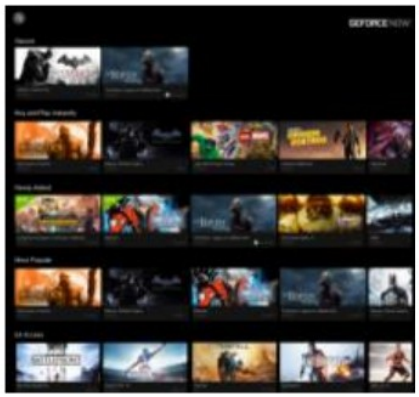
- Comparison between **G80(2006)** and **GP100(2016).**

	G80	**GP100**
Transistors	681 million	15300 million
SP	128	3584
SM	16	56
TPC	8	28
Base Clock	1350 MHz	1328 MHz
Process	90-nm CMOS	16-nm FinFET
TDP	170 Watts	300 Watts
Processing power (Single-presicion FMA)	345.6 GFLOPs	9519-10690 GFLOPs

Reference: [1],[2]

NVIDIA® Tesla® Applications





INTERNET & CLOUD

Image Classification
Speech Recognition
Language Translation
Language Processing
Sentiment Analysis
Recommendation

MEDICINE & BIOLOGY

Cancer Cell Detection
Diabetic Grading
Drug Discovery

MEDIA & ENTERTAINMENT

Video Captioning
Video Search
Real Time Translation

SECURITY & DEFENSE

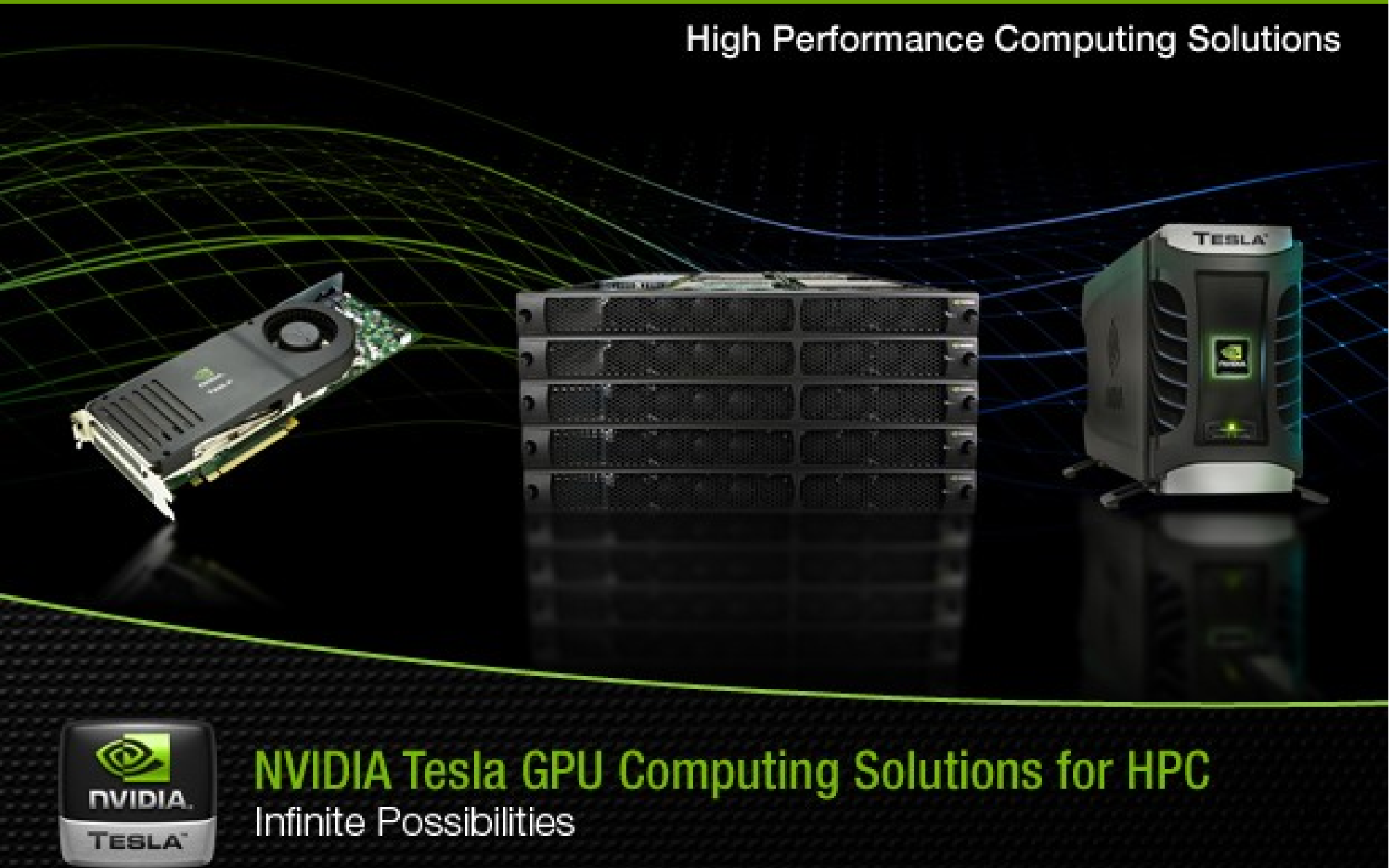
Face Detection
Video Surveillance
Satellite Imagery

AUTONOMOUS MACHINES

Pedestrian Detection
Lane Tracking
Recognize Traffic Sign

Reference: [5]

Thank You!


High Performance Computing Solutions
TESLA
NVIDIA
TESLA
NVIDIA Tesla GPU Computing Solutions for HPC
Infinite Possibilities

References

[1] E. Lindholm, J. Nickolls, S. Oberman, J. Montrym; „NVIDIA TESLA: A UNIFIED GRAPHICS AND COMPUTING ARCHITECTURE“; NVIDIA, IEEE Compute Society 2008.

[2] NVIDIA, “NVIDIA Tesla P100”, Whitepaper, 2016

[3] Scientific Volume Imaging B.V., Huygens GPU acceleration: Increase your computing performance by using the power of the GPU, https://svi.nl/HuygensGPU,

[4] NVIDIA, WHAT IS GPU-ACCELERATED COMPUTING? http://www.nvidia.com/object/what-is-gpu-computing.html

[5] NVIDIA, Deep Learning on GPUs, http://on-demand.gputechconf.com/gtc/2015/webinar/deep-learning-course/intro-to-deep-learning.pdf, 2016

[6] Ziff Davis, LLC.PCMag Digital Group, Nvidia’s 2016 roadmap shows huge performance gains from upcoming Pascal architecture https://www.extremetech.com/gaming/201417-nvidias-2016-roadmap-shows-huge-performance-gains-from-upcoming-pascal-architecture