A HISTORIC MOMENT
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THE ROAD TO REAL-TIME PHOTOREAL

GEOMETRY
Rens
THE ROAD TO REAL-TIME PHOTOREALISTIC PHOTOGRAMMETRY

GEOMETRY
Rens

PHOTOGRAMMETRY
Rens
THE ROAD TO REAL-TIME PHOTOREAL
THE ROAD TO REAL-TIME PHOTOREAL

GEOMETRY
Rens

MATERIALS
NVIDIA

PHOTOGRAMMETRY
Rens

SIMULATION
NVIDIA
THE ROAD TO REAL-TIME PHOTOREAL
THE ROAD TO REAL-TIME PHOTOREAL

GEOMETRY
Rens

MATERIALS
NVIDIA

CHARACTER ANIMATION
University of Edinburgh

PHOTOGRAMMETRY
Rens

SIMULATION
NVIDIA

FACIAL ANIMATION
Digital Domain
THE HOLY GRAIL OF COMPUTER GRAPHICS

Turner Whitted
1979
“Multi-bounce Recursive Ray Tracing”
1.2 Hours for 512x512 on VAX 11/780
NVIDIA RTX TECHNOLOGY
Announced at GDC, March 2018
NVIDIA RTX TECHNOLOGY
Announced at GDC, March 2018
ANNOUNCING QUADRO RTX
WORLD’S FIRST RAY TRACING GPU

RTX Family
Up to 10 Giga Rays/sec
Up to 16 TFLOPS + 16 TIPS
Up to 500 Trillion Tensor Ops/sec
Up to 100 GB/sec with NVLink
NEW TURING GPU
GREATEST LEAP SINCE 2006 CUDA GPU

A Step-function Jump in Realism
New Hybrid Rendering Model
Interoperable Rasterization, Ray Tracing, Compute, and AI
Amazing for Today’s — Awesome for Tomorrow’s Content
GIANT LEAP

PASCAL
11.8 Billion xtors | 471 mm² | 24 GB 10GHz

TURING
18.6 Billion xtors | 754 mm² | 48+48 GB 14GHz
GIANT LEAP

PASCAL
- 11.8 Billion xtors
- 471 mm²
- 24 GB 10GHz

TURING
- 18.6 Billion xtors
- 754 mm²
- 48+48 GB 14GHz

TENSOR CORE
- 125 TFLOPS FP16
- 250 TOPS INT8
- 500 TOPS INT4

RT CORE
- 10 Giga Rays/Sec

SHADER | COMPUTE
- 15 TFLOPS FP32
- 50 TOPS INT8
NVIDIA RTX
NEW GENERATION OF HYBRID RENDERING
Interoperability Between Rasterization, Ray Tracing, Compute, AI
New Turing Ray Tracing Acceleration in OptiX, DXR, Vulkan
New NGX SDK for DNN Plug-Ins
New NVIDIA MDL Materials Open Source
New Support for Pixar Universal Scene Description (USD)
TURING OPENS $250B VISUAL EFFECTS INDUSTRY

- DESIGN
- DCC
- AEC
- VISUALIZATION
- FILM & TELEVISION
“Real-time ray tracing is here years before anyone thought possible and it’s going to completely change how artists and designers work.”

- Tim Sweeney, CEO, Epic Games
TURING 6X PASCAL

EPIC UE4 RTX ENGINE
MICROSOFT DIRECTX RAY TRACING

PASCAL | R | S | RT | 308 ms

PASCAL | R | S | RT | 576 ms
TURING 6X PASCAL
EPIC UE4 RTRT ENGINE
MICROSOFT DIRECTX RAY TRACING

PASCAL

<table>
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TURING

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<table>
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</table>
NVIDIA DLAA
BREAKTHROUGH IN HIGH-QUALITY MOTION IMAGE GENERATION

Temporally Stable Convolutional Autoencoder
~500 Billion FP16 Ops

Ground Truth
64 Jittered Sample Rendering
Blended
“Turing’s real-time ray tracing and AI capabilities will literally change our cities of the future.”

- Cobus Bothma, KPF
AUTODESK ARNOLD
ACCELERATED BY NVIDIA RTX
ANNOUNCING
NVIDIA RTX SERVER
PRODUCTION RENDERING WITH GLOBAL ILLUMINATION

Powered by Quadro RTX 8000
Ray Traced Global Illumination up to 96 GB Scenes
Remoting and Multi-GPU Virtualization with New Quadro Infinity
Rendering Time Reduced from Hours to Minutes
Q4 Early Access - Q1 GA
TODAY’S RENDER FARM

240 Dual 12-core Skylake CPU Servers
144 kW
$2M Render Farm
NVIDIA RTX SERVERS
A FRACTION OF THE COST

4 RTX 8-GPU Servers
13 kW
$500,000

1/4 the Cost  1/10 the Space  1/11 the Power
NVIDIA RTX SERVERS
A 3-SECOND SHOT IN AN HOUR

4 RTX 8-GPU Servers
13 kW
$500,000

4X Performance  1/3 the Space  1/3 the Power
We never expected to see results this dramatic. This will completely change how our artists work.

- Michele Sciolette, CTO, Cinesite
ANNOUNCING QUADRO RTX
WORLD’S FIRST RAY TRACING GPU

RTX 5000   16 GB / 32 GB   6 Giga Rays/sec   $2,300
ANNOUNCING QUADRO RTX
WORLD’S FIRST RAY TRACING GPU

RTX 5000
16 GB / 32 GB
6 Giga Rays/sec
$2,300

RTX 6000
24 GB / 48 GB
10 Giga Rays/sec
$6,300
ANNOUNCING QUADRO RTX
WORLD’S FIRST RAY TRACING GPU

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<th>Model</th>
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<th>Throughput</th>
<th>Price</th>
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<tr>
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NVIDIA TURING — GRAPHICS REINVENTED

TURING
“RTRT 6X Pascal”

QUADRO RTX 8000 / 6000 / 5000
“World’s First Ray Tracing GPU”

QUADRO RTX SYSTEMS
“7 Shots a Day”

$250B VISUAL EFFECTS INDUSTRY
“Turing Does Photoreal VFX!”