

Unleashing the Power of GPUs

Your 20-day journey into high-performance computing and AI acceleration.



Day 1: Kickoff & NVIDIA's Origin Story

Your Accelerated Learning Journey

01

Course Roadmap

Discover what this 20-day journey into GPU computing looks like, from foundations to advanced applications.

02

Skill Unlocked

By the end, you'll harness GPU power for real-world AI, data science, and high-performance tasks.

This course will equip you with practical skills and a deep understanding of GPU acceleration.

From Diner Idea to Tech Giant



NVIDIA's humble beginnings trace back to a Denny's diner in 1993, where three co-founders envisioned a future powered by parallel processing.

They took a huge risk, betting everything on the then-niche Graphics Processing Unit (GPU), a decision that would redefine computing.

From a small startup, NVIDIA has grown into a \$3 trillion giant, a testament to their unwavering vision.

Why GPUs Matter: A Paradigm Shift

1999: GeForce 256

Dubbed the "world's first GPU," it revolutionized graphics and gaming by offloading complex calculations from the CPU.

1

2007: CUDA Launch

NVIDIA introduced CUDA, a parallel computing platform and programming model, enabling developers to program GPUs for general-purpose applications, unleashing their true power.

2

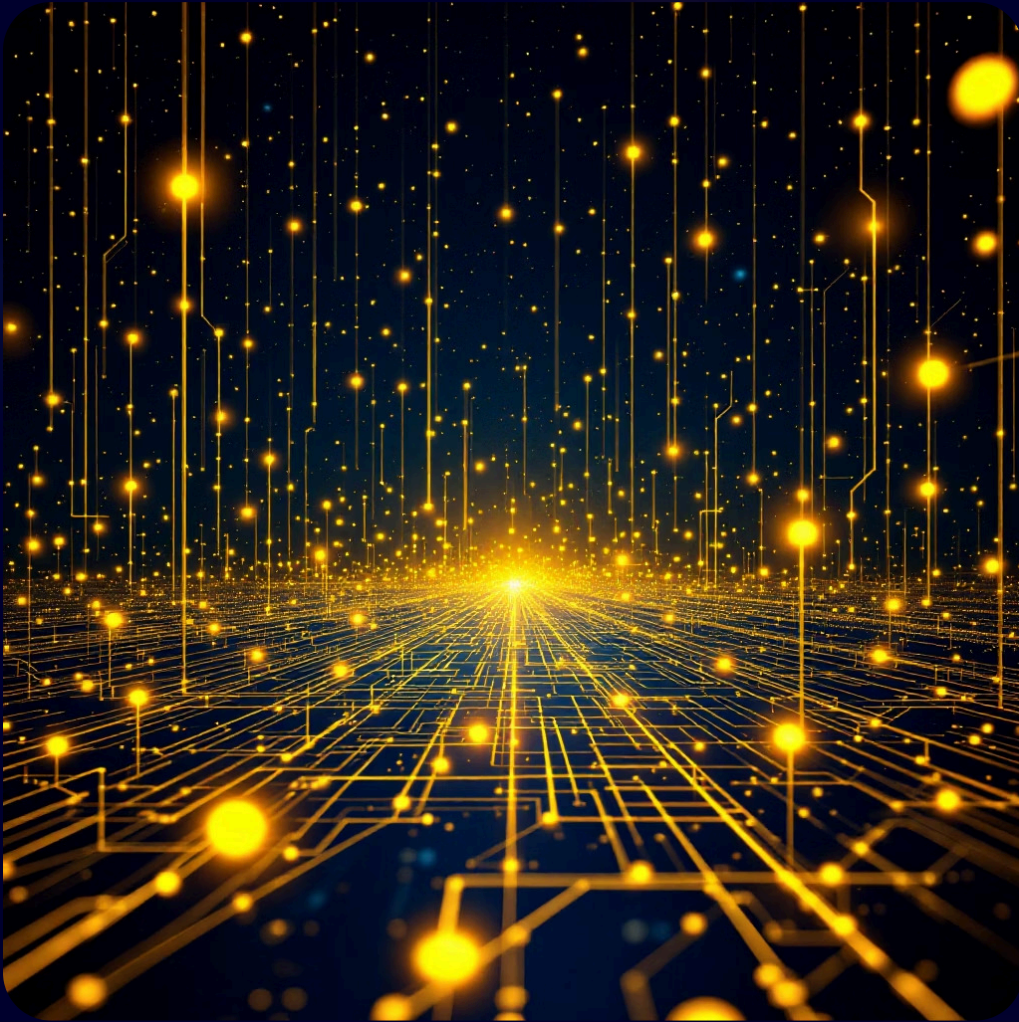
3

Graphics to General-Purpose Compute

The GPU evolved beyond just rendering pixels, demonstrating its potential for broader computational tasks (GPGPU).

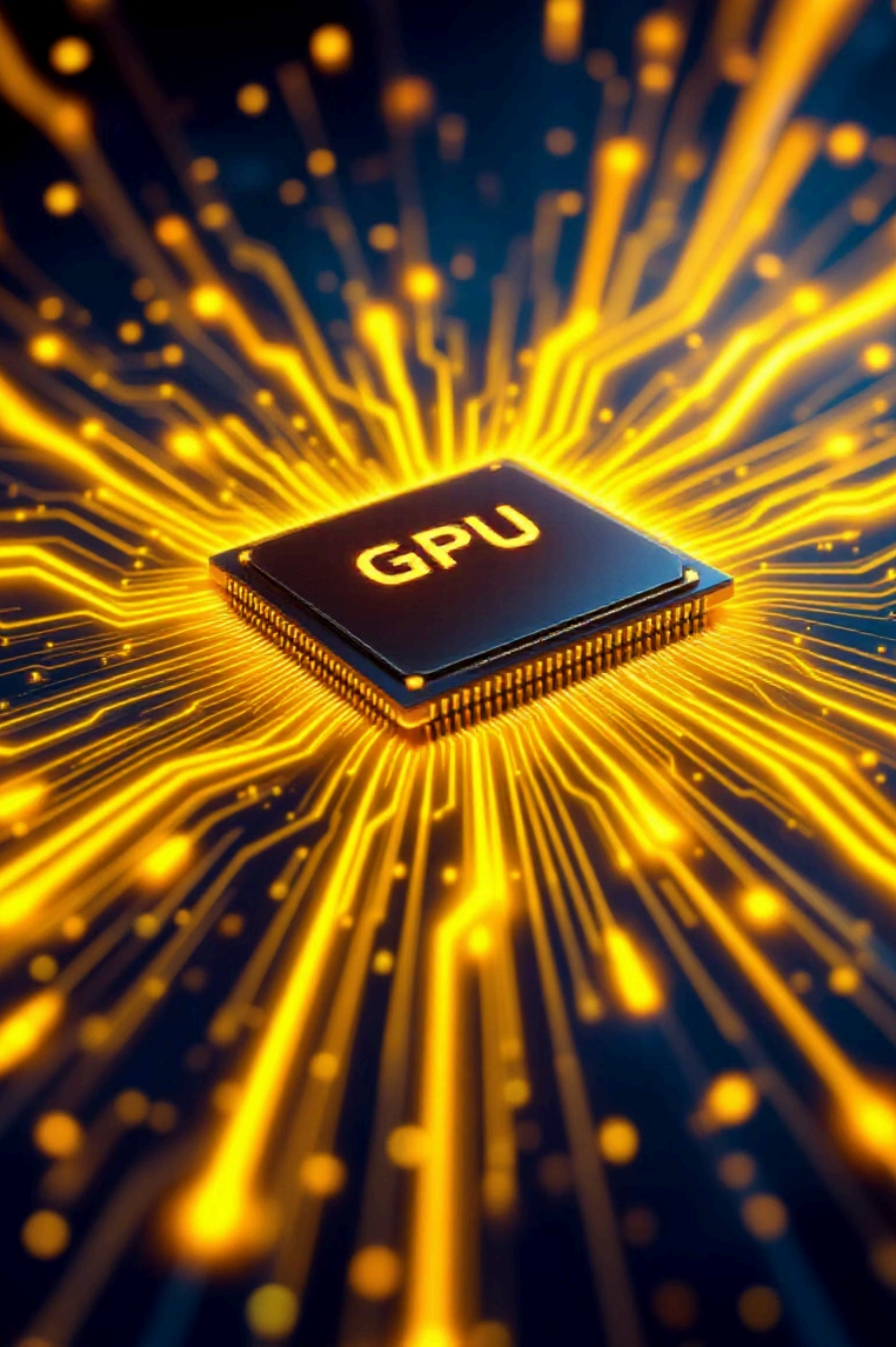
This marked the transition of GPUs from specialized graphics processors to powerful, versatile computing engines.

GPUs Shaping Our World



- Driving AI innovations, from self-driving cars to medical diagnostics.
- Powering immersive gaming experiences and realistic simulations.
- Accelerating scientific breakthroughs in drug discovery, climate modeling, and astrophysics.

GPUs are the silent engines behind the complex matrix multiplications and deep learning algorithms that define modern AI.



Why Speed Matters

"The true power of GPUs lies in their ability to unlock workflows once deemed impossible."

GPU acceleration doesn't just make things faster; it fundamentally changes what we can achieve. By dramatically reducing computation time, GPUs enable us to tackle problems of unprecedented scale and complexity, fostering new discoveries and innovations.

Hands-On: Feel the Performance Jump

 Join us in a Colab activity to experience GPU acceleration firsthand.

Python Loop vs. NumPy (CPU)

First, we'll run a computationally intensive task using a standard Python loop and then optimize it with NumPy, observing the difference on your CPU.

GPU Runtime Activation

Next, we'll switch to a GPU runtime in Colab and rerun the same NumPy code, harnessing the power of the GPU.

Witness the Acceleration

Prepare to be amazed as you observe a significant performance jump, demonstrating the raw speed of GPU computing.



Key Lesson: Acceleration Changes What's Possible

The practical session will highlight that acceleration isn't just about optimization; it's about expanding the boundaries of what's computationally feasible. Complex simulations, real-time AI, and massive data analyses become tractable problems.

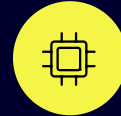
This opens doors to research and applications that were once confined to theory due to computational limitations.

Recap: Day 1 Learnings



NVIDIA's Vision

How a bold bet on GPUs led to a tech empire.



GPU Evolution

From graphics to general-purpose computing.



Real-World Impact

GPUs driving AI, gaming, and scientific breakthroughs.



Performance Leap

Experiencing acceleration firsthand in Colab.

Today, we set the stage for understanding the transformative power of GPU technology.



What's Next?

- **Pre-reading:** Dive deeper into the architecture of modern GPUs.
- **Homework:** Experiment with the Colab notebook, trying different array sizes to observe performance scaling.
- **Day 2 Preview: The CUDA revolution & developer ecosystem**

Get ready to unlock even more of the GPU's potential!