KÜNSTLICHE INTELLIGENZ

…JOBKILLER VON MORGEN?

Marc Stampfli

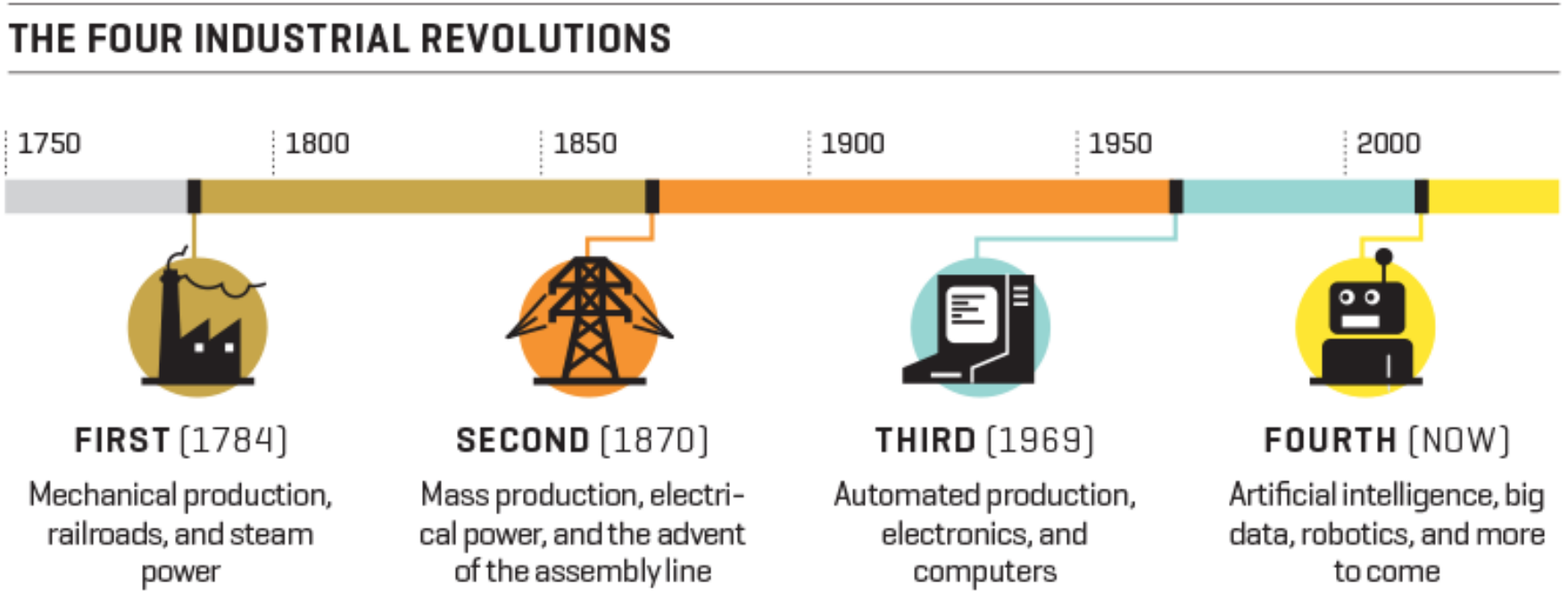
NVIDIA

https://www.linkedin.com/in/marcstampfli/

https://twitter.com/marc_stampfli

E-Mail: mstampfli@nvidia.com

INTELLIGENT ROBOTS AND SMART MACHINES

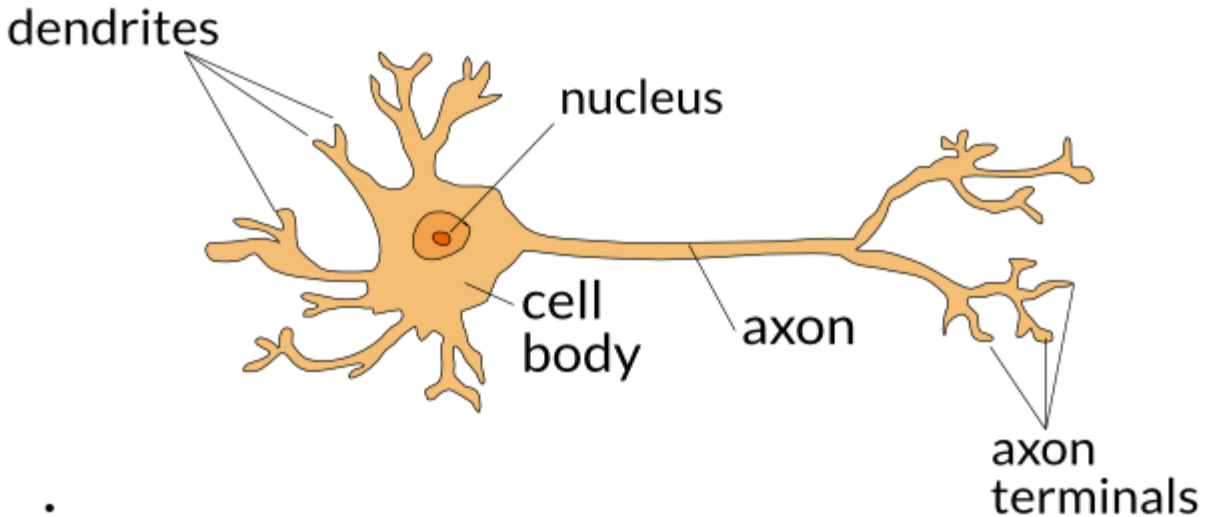


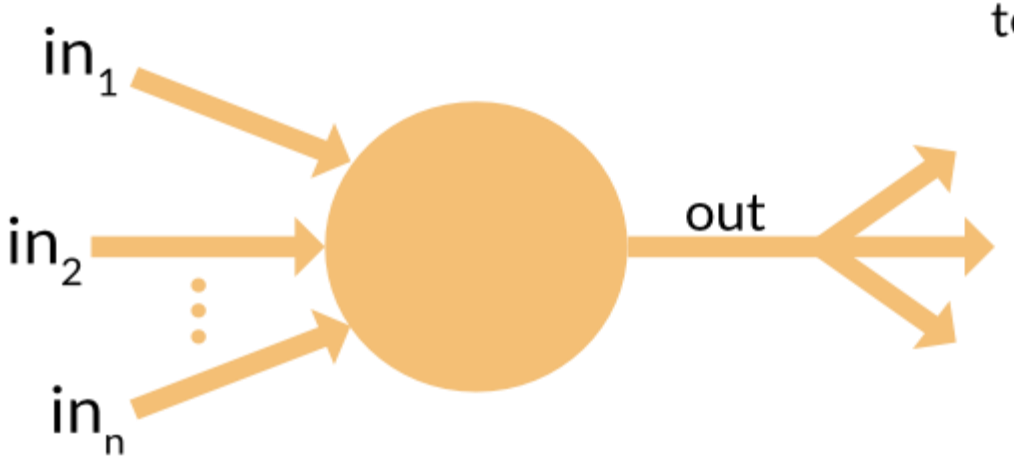
"mobile computing, inexpensive sensors collecting terabytes of data, and the rise of machine learning that can use that data will fundamentally change the way the global economy is organized."

— Fortune, "CEOs: The Revolution is Coming" March 8, 2016

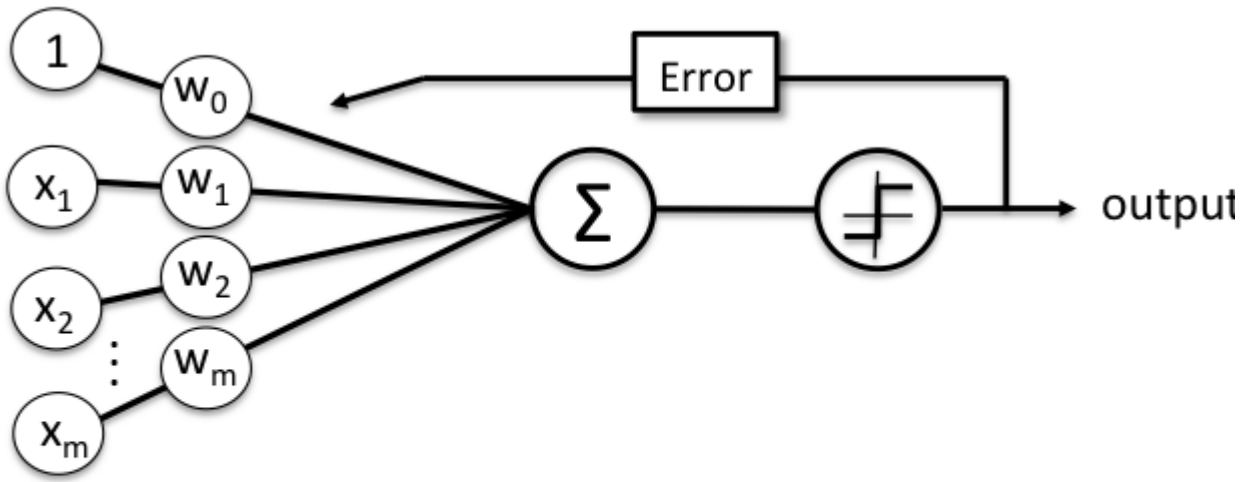
ARTIFICIAL NEURONAL NETWORK

ARTIFICIAL NEURAL NETWORK



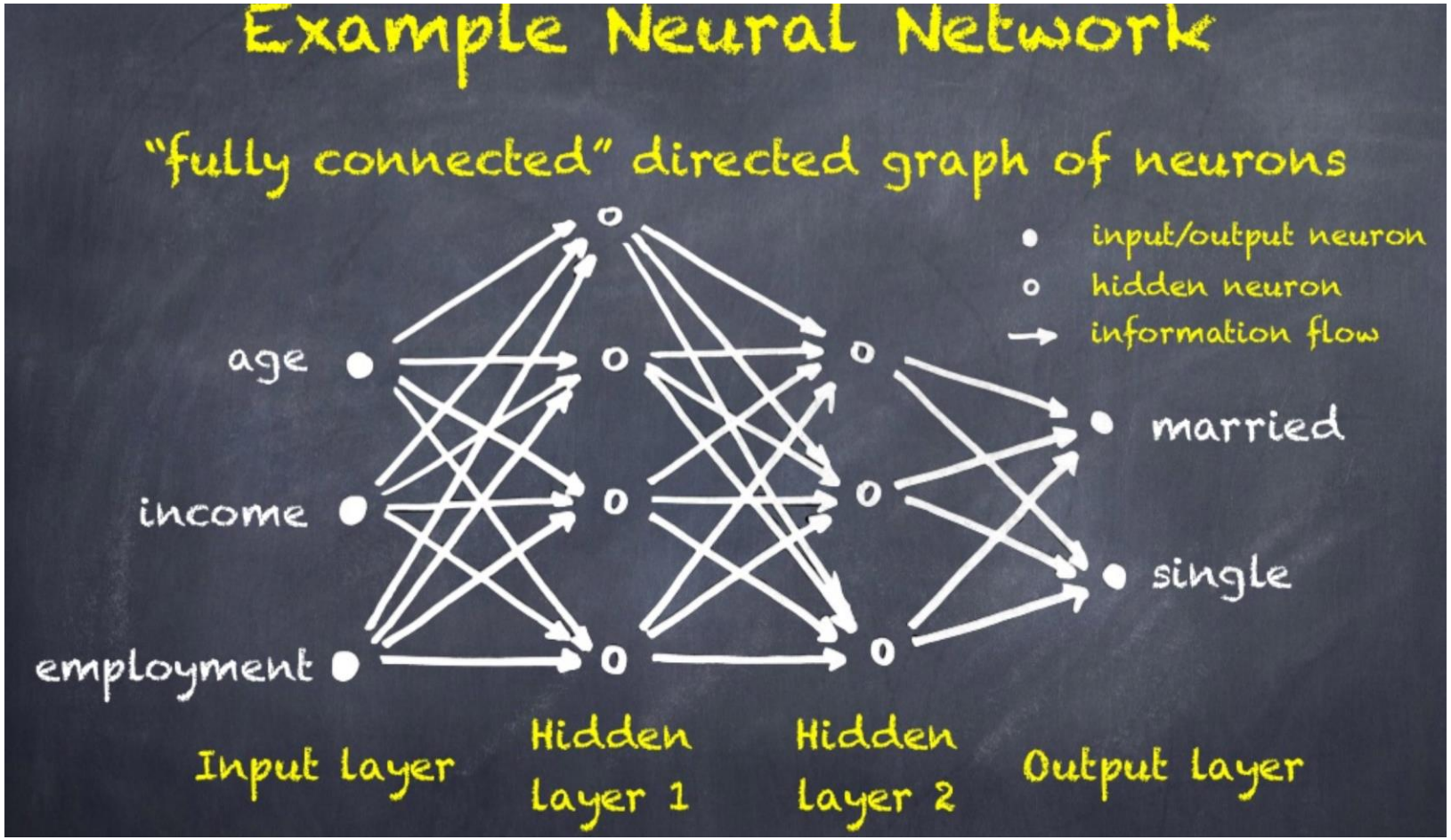


ARTIFICIAL NEURAL NETWORK

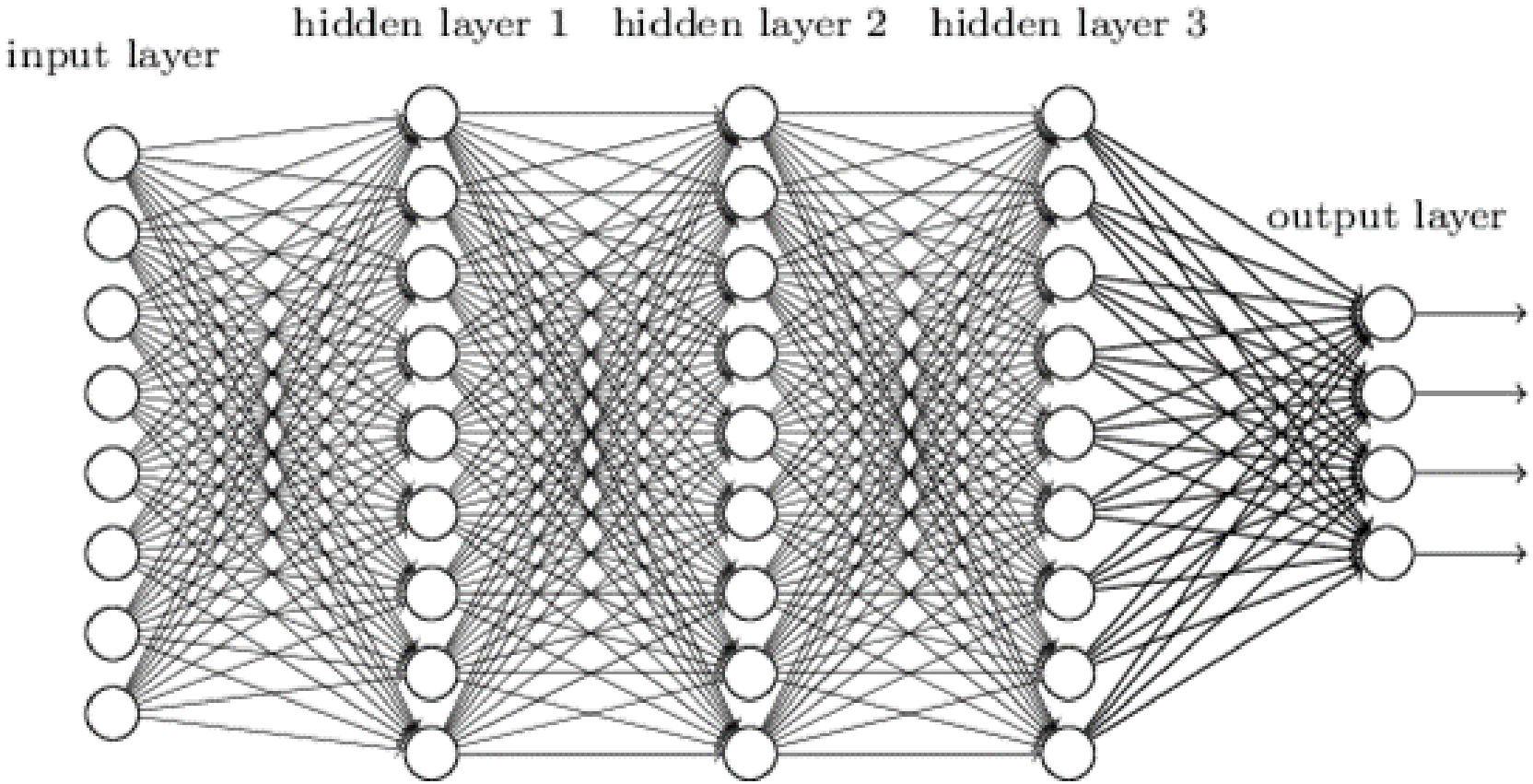


Schematic of a perceptron classifier.

ARTIFICIAL NEURAL NETWORK



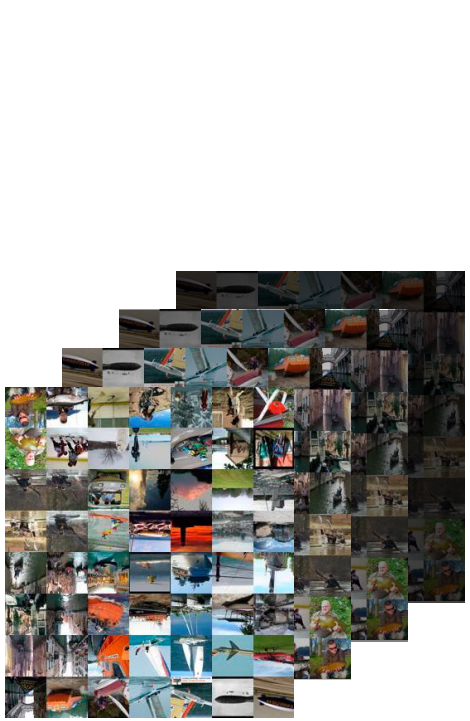
DEEP ARTIFICIAL NEURAL NETWORK

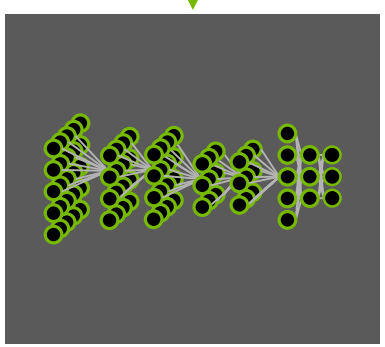


11 billion neural connections today (frog), compare to humans 100 trillions

DEEP LEARNING — A NEW COMPUTING MODEL

"Software that writes software", "AI is eating Software"





"little girl is eating
piece of cake"

NVIDIA IGNITES THE AI BIG BANG

Artificial intelligence is the use of computers to simulate human intelligence.

AI amplifies our cognitive abilities — letting us solve problems where the complexity is too great, the information is incomplete, or the details are too subtle and require expert training.

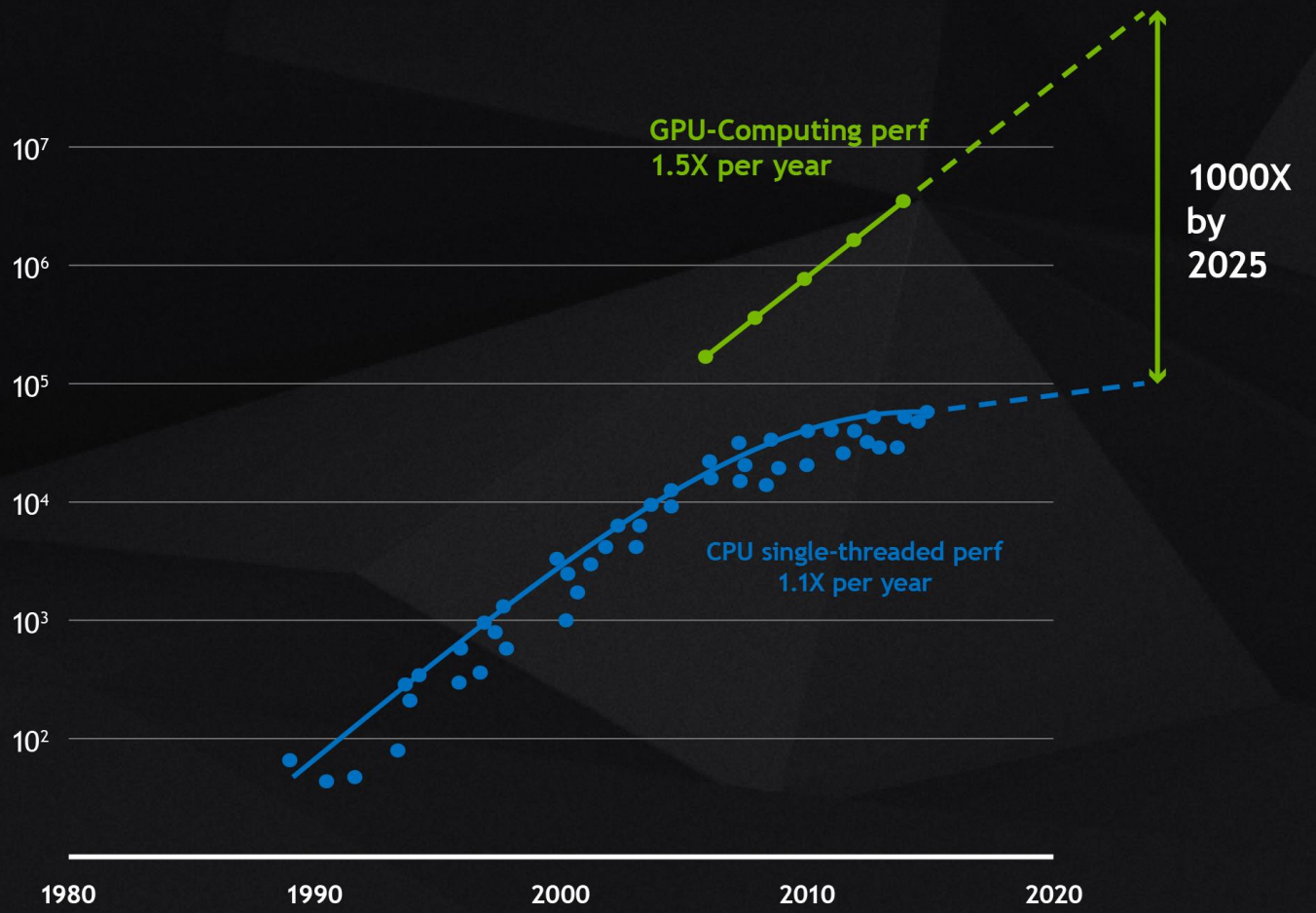
Learning from data — a computer's version of life experience — is how AI evolves. GPU computing powers the computation required for deep neural networks to learn to recognize patterns from massive amounts of data.

This new computing model sparked the AI era.

THE TIME FOR GPU COMPUTING HAS COME

For 30 years, the dynamics of Moore's law held true. Microprocessor performance advanced at a rate of 50 percent per year as more and more transistors were fit onto a single chip. But that approach is hitting the limits of semiconductor physics, and, today, CPU performance only grows by 10 percent per year.

NVIDIA GPU computing has given the industry a path forward — and will provide a 1,000X speed-up by 2025. NVIDIA's CUDA® programming model complements the CPU with a specialized processor suited for parallel processing. And we innovate across the entire stack, from processor to systems to algorithms to applications.



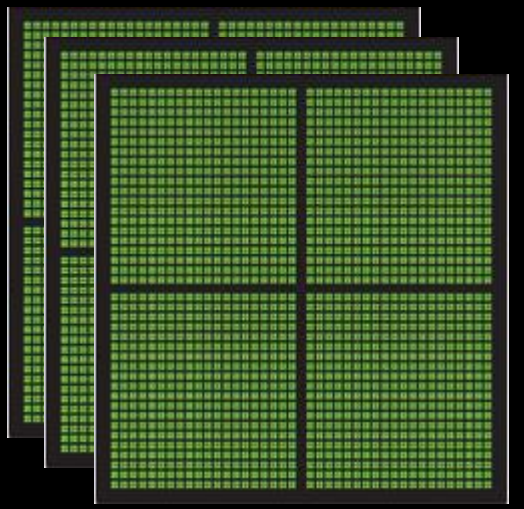
40 Years of Microprocessor Trend Data

What makes a GPU different

- A core in a chip is the processing unit which receives instructions and performs calculations
- Clock rate refers to the frequency at which one core of a multi-core processor is running
- More cores means more calculations per clock cycle
- CPU optimized for sequential serial processing of complex orders
- GPU optimized for massive parallel processing of calculations

CPU with multiple Cores

e.g. 12-20 Cores

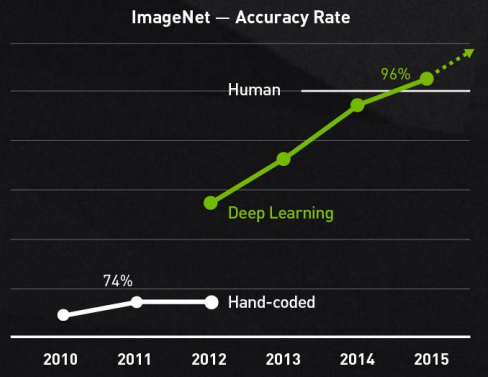


GPU with n-times Thousands of Cores

e.g. n x 5120 cores

AI ACHIEVES "SUPERHUMAN" RESULTS

The big bang of modern AI set off a string of "superhuman" achievements. In 2015, Google and Microsoft both beat the best human score in the ImageNet challenge. DeepMind's AlphaGo recorded its historic win over Go champion Lee Sedol in 2016 and, more recently, beat the best player in the world, Ke Jie. Breakthroughs in AI happen almost every day.



MODERN AI IS REVOLUTIONIZING EVERY INDUSTRY

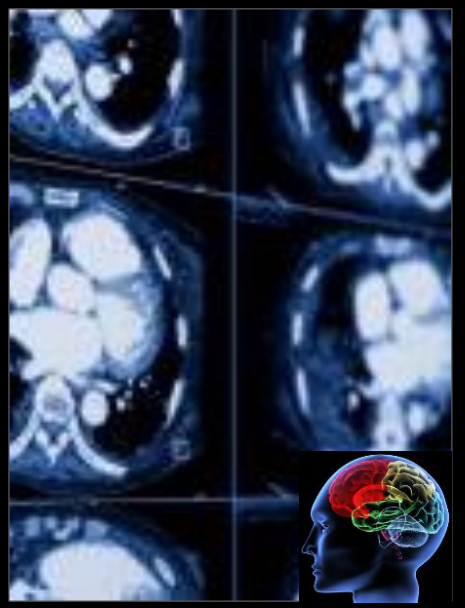
In addition to our AI technologies, we advance fundamental research, foster universities and startups, and bring our full capabilities to industries where we can have the greatest impact.

DEEP LEARNING IS SWEEPING ACROSS INDUSTRIES

INTERNET SERVICES

Image/Video classification
Speech recognition
Natural language processing

MEDICINE



Cancer cell detection
Diabetic grading
Drug discovery

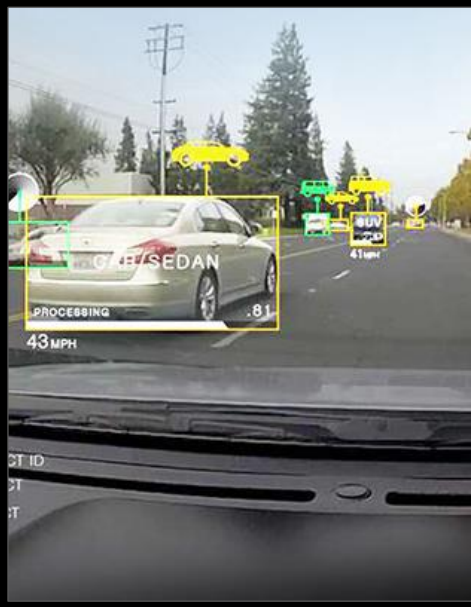
MEDIA & ENTERTAINMENT

Video captioning
Content based search
Real time translation

SECURITY & DEFENSE

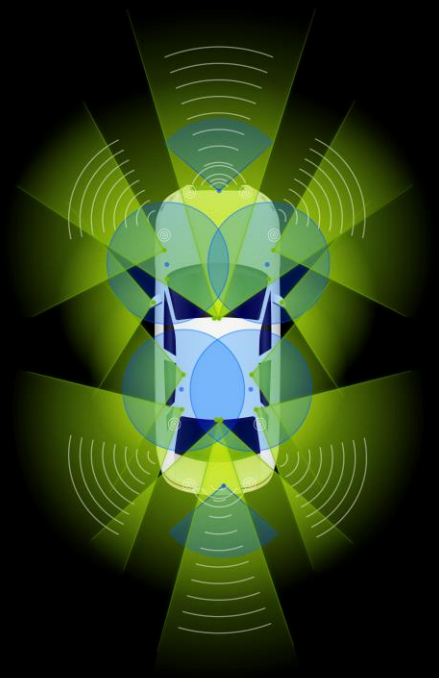
Face recognition
Video surveillance
Cyber security

AUTONOMOUS MACHINES

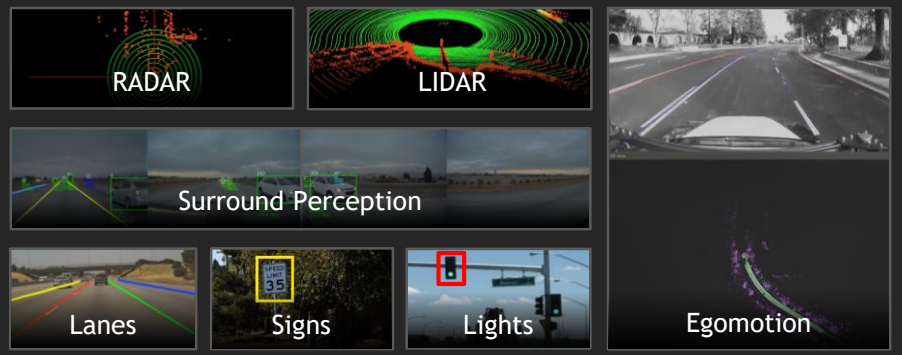


Pedestrian detection
Lane tracking
Recognize traffic signs

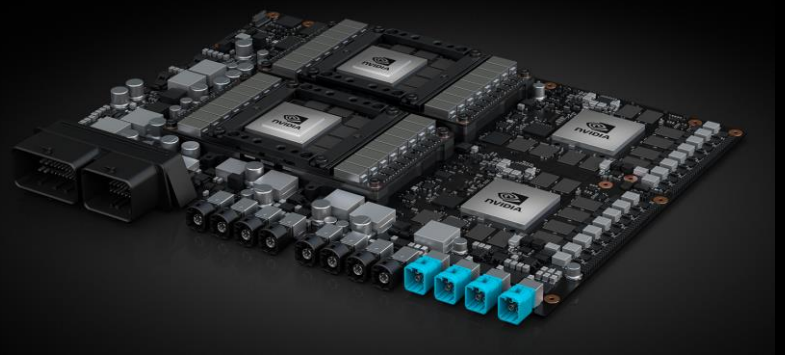
NVIDIA DRIVE PLATFORM FOR SELF DRIVING VEHICLES



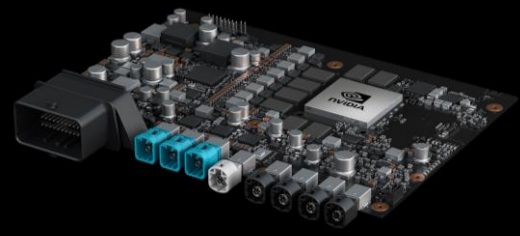
DRIVE AV



DRIVE PEGASUS

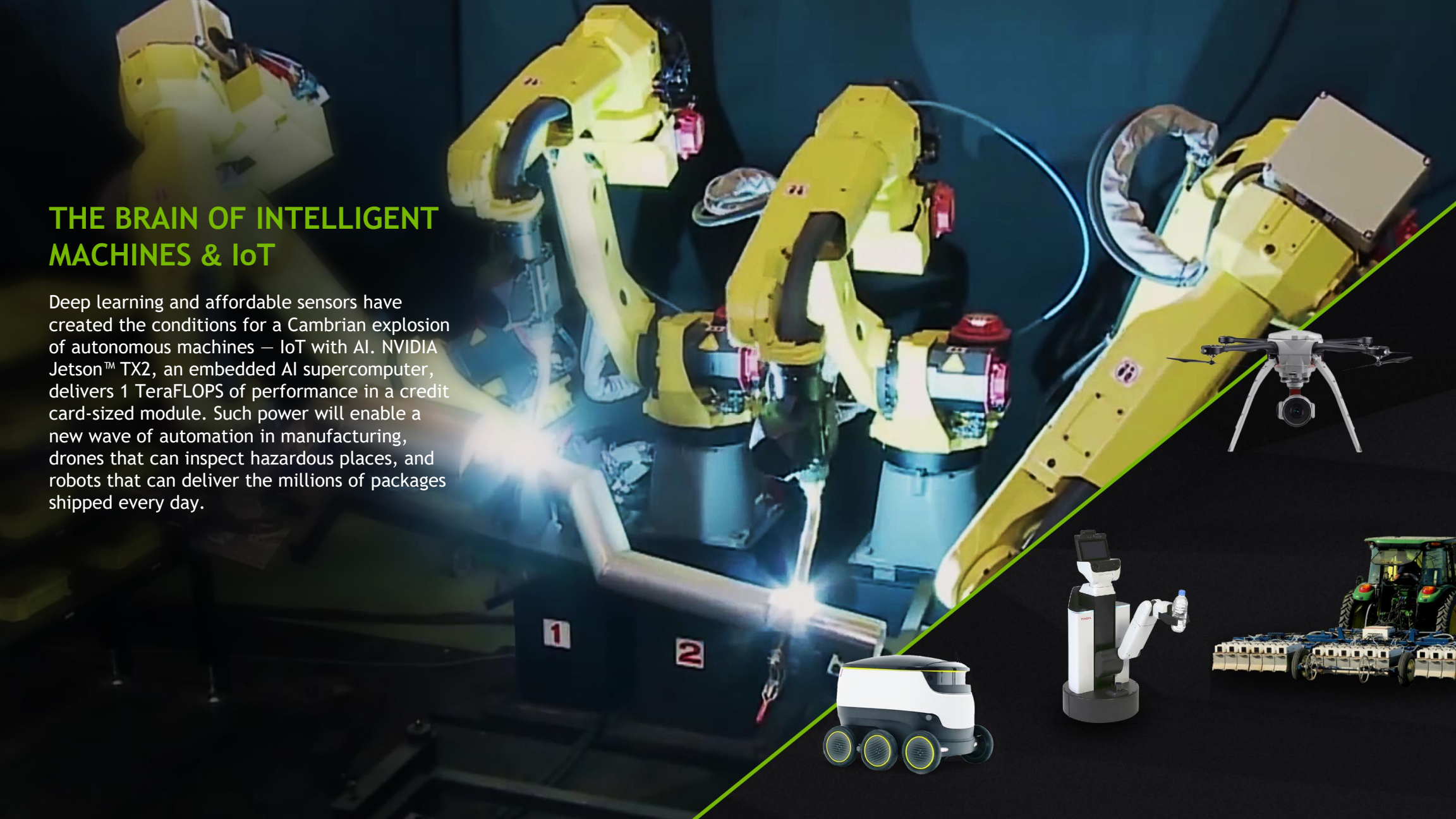


DRIVE XAVIER



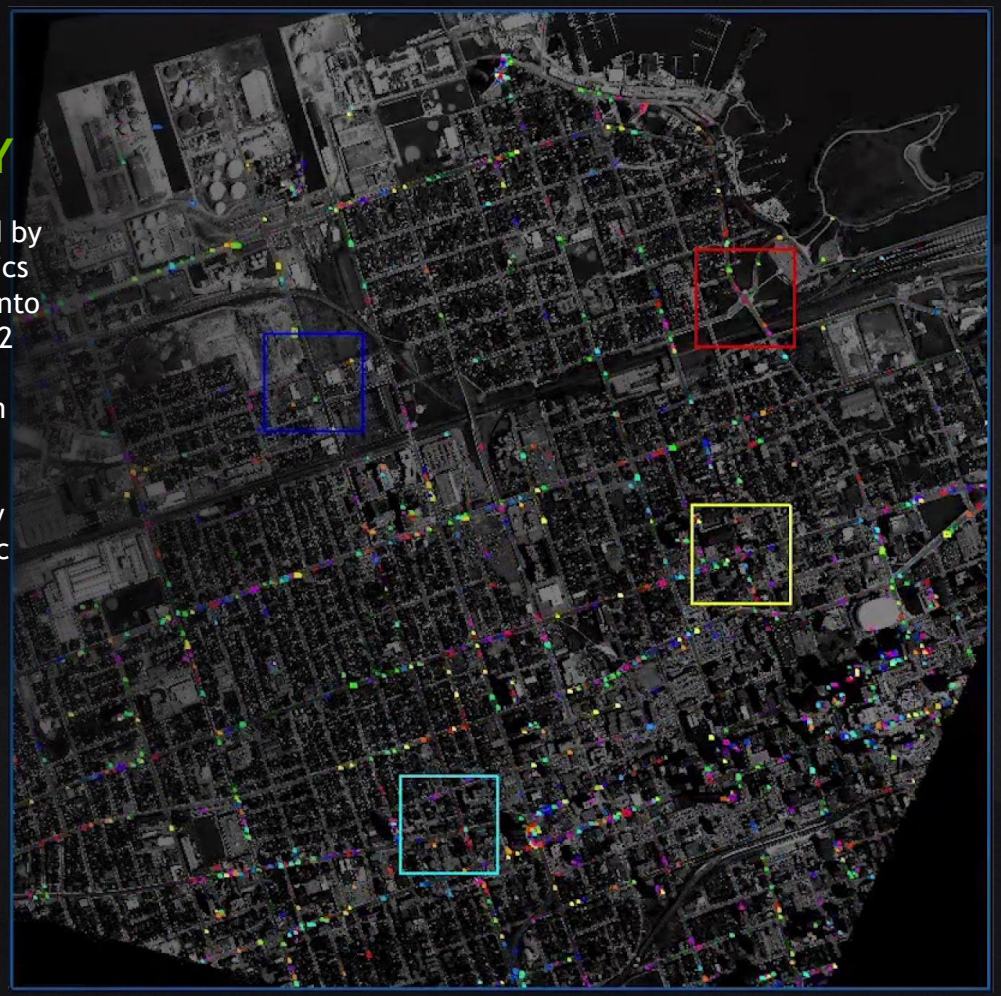
THE BRAIN OF INTELLIGENT MACHINES & IoT

Deep learning and affordable sensors have created the conditions for a Cambrian explosion of autonomous machines — IoT with AI. NVIDIA Jetson™ TX2, an embedded AI supercomputer, delivers 1 TeraFLOPS of performance in a credit card-sized module. Such power will enable a new wave of automation in manufacturing, drones that can inspect hazardous places, and robots that can deliver the millions of packages shipped every day.

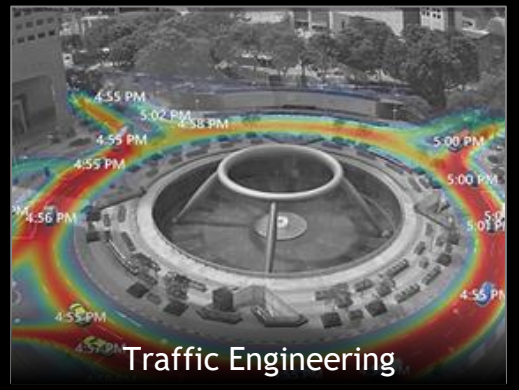


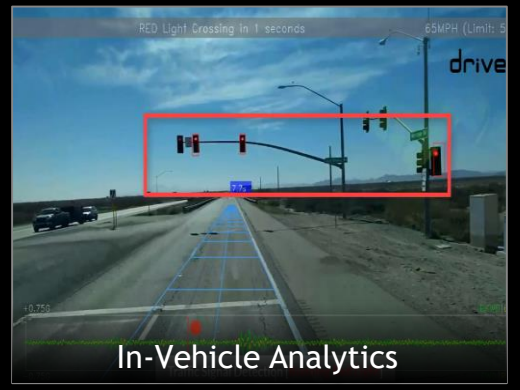
THE BRAIN OF THE AI CITY

There will be 1 billion cameras in the world by 2020. AI will power intelligent video analytics that can turn this massive amount of data into safer, more efficient cities. With Jetson TX2 at the edge and Tesla GPUs in the cloud, NVIDIA Metropolis is an end-to-end platform that provides a foundation for the AI City. More than two dozen partners around the world have adopted Metropolis for a variety of applications, from public safety to traffic management to city services.



DEEPSTREAM FOR REALTIME ANALYTICS AT SCALE





CALL TO ACTION

DEEP LEARNING INSTITUTE

DLI Mission: Help the world to solve the most challenging problems using AI and deep learning

We help developers, data scientists and engineers to get started in architecting, optimizing, and deploying neural networks to solve real-world problems in diverse industries such as autonomous vehicles, healthcare, robotics, media & entertainment and game development.

GPU TECHNOLOGY CONFERENCE

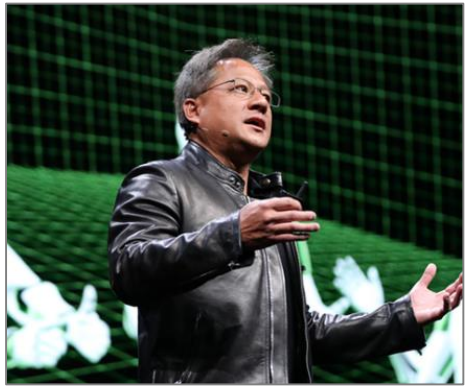
October 9-11, 2018 | Munich | #GTC18
www.gputechconf.eu

CONNECT

Connect with technology experts from NVIDIA and other leading organizations

LEARN

Gain insight and valuable hands-on training through hundreds of sessions and research posters



DISCOVER

See how GPU technologies are creating amazing breakthroughs in important fields such as deep learning

INNOVATE

Hear about disruptive innovations as early-stage companies and startups present their work

REGISTRATION IS OPEN AT WWW.GPUTECHCONF.EU

Don’t miss the world’s most important event for GPU developers
October 9—11, 2018 in Munich

NVIDIA

> Founded in 1993

> Jensen Huang, Founder & CEO

> 11,000 employees

> $6.9B in FY17

"World's Best Performing CEOs"
— Harvard Business Review

"World's Most Admired Companies"
— Fortune

"World's Best CEOs"
— Barron's

"Most Innovative Companies"
— Fast Company

"Employees' Choice: Highest Rated CEOs"
— Glassdoor

"50 Smartest Companies"
— MIT Tech Review


NVIDIA