

THE GLOBAL TECH RACE

AI, CHIPS AND INTELLIGENT INFRASTRUCTURE

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In 2025, the AI race erupted into a battleground between the U.S. and China. Semiconductors – the essential building blocks of chips – leapt to front-page news as Trump’s “Liberation Day” tariffs conspicuously spared them, only to target them with a national-security probe two weeks later. Washington is now mulling 100 percent duties on imports from non-U.S. firms, while Beijing flexes its diplomatic and economic muscle to expand its hold on the semiconductor chain in Southeast Asia and beyond.

Semiconductors have become the oil of the AI age – symbols of power, politics and progress. While Taiwan is the undisputed capital of chip-making, governments worldwide are shoveling billions into establishing domestic fabrication plants, or fabs, and luring massive data-center projects, hoping to cement themselves as AI and business hubs. These facilities’ vast appetite for electricity is reshaping power geographies – from the Nordics to rising hubs in Malaysia, Morocco and South Africa. Meanwhile inside boardrooms, 82 percent of executives say that scaling AI is a top priority (MIT). And the latest buzzword isn’t *chatbot*, it’s *agents* – autonomous systems that deduce, plan and act. But these AI tools are also arming cyber criminals, with sophisticated, machine-speed attacks targeting new vulnerabilities. Here, we trace the chain from end to end – from infrastructure trends to chip design, and the software reshaping business models – to find out who is setting the pace, and how, in the global tech race.

New power geographies: Where will compute live?

Data center systems spending is expected to surge 42.4 percent this year, as organizations invest heavily in AI capabilities (Gartner). With data centers’ power demand expected to reach 4 percent of the global power demand by 2030 (McKinsey), software computation, or compute, is shifting to regions that offer cheap energy and permissive grid regulations.

NTT Global Data Centers is scaling nearly a gigawatt across Europe, “doubling down in Frankfurt, London, Amsterdam and Paris, and in tier two sites like Berlin,” says EMEA Managing Director Konstantin Hartmann. To address power, NTT is “exploring SMRs, fuel cells and green hydrogen.” Meanwhile, Oliver Schiebel, CEO of hscale, is targeting Milan, Madrid and Oslo, and “actively investigating” opportunities in the Middle East. “We expect substantial growth in Norway,” he adds. The Nordic countries, after first serving the crypto mining boom, are now an AI data center hotspot with cooler climates and renewable energies cutting power costs. Here, NVIDIA’s GPU boom has fueled demand from a new class of providers: NeoClouds – GPU-as-a-service specialists building AI-native environments from the ground up. Hyperscalers, by contrast, still run broad, multi-purpose clouds and are only now densifying infrastructure for AI at scale. “In the coming years, NeoClouds are expected to account for a significant

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JOSH PARKER | CSO, **NVIDIA**

AI is probably the most democratizing technology ever developed—which means small teams and even individuals are empowered to do more with less, and to test new ideas. We’re really living in the Cambrian explosion of tech, and there are more opportunities than ever for positive, innovative disruption.



TANUJA RANDERY | EMEA MANAGING DIRECTOR, **AWS**

We are heading toward a future where humans and agents work side by side to execute tasks — whether that is shopping, back-to-school planning or optimizing agriculture.



KAI BECKMANN | CEO, **EMD ELECTRONICS**
A BUSINESS OF **MERCK, KGAA, DARMSTADT, GERMANY**

Supercomputers consume massive amounts of power. Compare that to the incredible human brain, which runs only on around 20 watts. Bioconvergence, using DNA to store data—which is currently still expensive and slow to write and read—could open a whole new area of storage.



RICHARD TENG | CEO, **BINANCE**

Blockchain and AI are two fundamental technologies that will drive every economic sector going forward, be it shipping, real estate or financial services.

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portion of demand,” says Dominic Ward, CEO of Verne, which operates centers in Iceland and Finland. Cologix observes the same outsourcing trend in Canada. “Instead of spending \$75 million on GPUs and IT staff, [companies] can connect to GPU-as-a-service providers in our centers,” says President Sean Maskell. He compares the shift to cloud adoption, which saw hybrid deployments combining legacy equipment with cloud services. “Now we are seeing hybrid AI: businesses will control part of their IT while using AI-as-a-service from providers next door.” Like the Nordic countries, Canada is a climate and green-energy sweetspot and, in Alberta, a huge data infrastructure build-out is underway. “A couple of years ago, AWS invested in building a \$4 billion data center here and told us: ‘we need to triple the number of data centers worldwide, and so do our competitors,’” recalls Rick Christiaan, CEO of Invest Alberta. That project kickstarted the region’s infrastructure focus. Today, it is developing ‘Wonder Valley’, set to become the world’s largest AI data center park, with 49 projects worth \$1 billion each.

Elsewhere, Malaysia is attracting new data infrastructure, offering proximity to tech-hub Singapore while providing more energy capacity. Indonesia, Morocco and South Africa are also gaining momentum. But when it comes to so-called AI factories, NVIDIA CSO Josh Parker points out that LLMs can be trained anywhere – client proximity isn’t an issue. “We say ‘AI doesn’t care where it goes to school,’” he says. “Having a fast connection to the internet doesn’t matter for AI training like it does for traditional data centers. Regions outside of today’s data center hubs could see new AI factories – if energy is available.”

AI ecosystems: Who converts brain to business?

The race isn’t just for land. In Munich, Paris and the Bay Area, researchers, VCs, and policymakers are rallying to cultivate local petri-dishes of public-



JAMES YANG | CEO, MICROIP

Chips are now national security assets. But developing a full chip ecosystem takes decades. Taiwan has spent nearly 50 years on this. Even if TSMC were to build a foundry in the UK, it would still need to ship chips back to Taiwan for packaging and testing. The U.S. also cannot build the whole supply chain alone.



ROBERT OPP | CHIEF DIGITAL OFFICER, UNDP

We are collaborating with partners in West Africa on digitizing the Twi language. Foundational LLM models often do not include a language like Twi, limiting the extent to which local populations can effectively use the latest technologies.



LINDA TSAI | PRESIDENT OF INTELLIGENT SYSTEM SECTOR, ADVANTECH

In factories, especially with labor shortages and aging populations, we will need autonomous robots. They will advance fast, while humanoid robots might still be far from being in our homes due to safety regulations and functional safety requirements.

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We shouldn’t fear AI – it’s a tool to stay ahead in a competitive market. With the right security in place, it can be embraced confidently. Our experts provide secure AI models, ensure compliance, and protect data across your business.

GREG BERARD | CEO, PELLERA TECHNOLOGIES



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private innovation. Expertise varies regionally: “In the Bay Area, AI is the dominant topic – from large language models to AI at the edge. In Europe, it’s industrial and automotive solutions,” says Patrick Aidoune, Group VP of Microcontrollers, Digital ICs and RF, STMicroelectronics.

Munich in Germany, for example, is a hub of innovation and investment. Ranked fifth in the EU Global Tech Ecosystem Index 2025, it has coupled academic heft with policy support. “Bavaria as a federal state prioritized AI early. With the Technical University of Munich and the IWA Valley startup scene, Munich ranks high for AI in Europe,” says Stefan Schaible, senior partner at Roland Berger. Senior Partner Marcus Berret says change is afoot in the whole EU bloc: “For 20 years we complained Europe was good at hardware, bad at software. That is changing. Now there is up to one trillion euros in additional funding for infrastructure and innovation.” Talent flows are shifting too, according to Dr. Oliver Schoppe, principal at VC firm UVC Partners: “We have seen an influx of talent to Europe, especially from the U.S., driven by political reasons.” And France is another European forerunner, with major players such as KLA Ancestors in hardware and Mistral in AI software. “The French government’s political support has strengthened this ecosystem,” says Youssef El Manssouri, co-founder and CEO of Sesterce. But Europe’s Achilles heel remains scale. “Too many young companies struggle to grow. If Europe wants to foster innovation, we must reduce bureaucracy,” says Prof. Dr. Niko Mohr, CEO of Rittal and Executive Board Member at Friedrich Loh Group.

Hardware’s next act: Packaging and photonics

With so much investment focus on R&D, chip innovation is accelerating. “Look at Taiwan Semiconductor Manufacturing Company (TSMC): moving from 28nm to 10nm took seven years. But now we are seeing a new process node – from 5nm to 3nm to 2nm – announced every one or two,” says William Cheng, senior vice president at iST.

2025 is the 60-year anniversary of Moore’s law, and transistors are now nearing atomic dimensions. The next leap is new architectures. “Since we have hit physical limits on shrinking, innovation is moving to the back end. Smart packaging – heterogeneous integration – is the next frontier,” says Burkhardt Frick, CEO, SUSS MicroTec. Heterogeneous integration is moving fast too, propelled by the economic value of AI systems; that’s why Samer Kabbani, CEO of AEM Holdings, calls the commercial sweet spot “the middle stack – package assembly and integration testing.” Meanwhile, new players are joining the game: In February, Arm announced it would start building its own chips – a move that will bring it into direct competition



Everyone wants AI to handle more processes, but AI only works if those processes are well structured. If the backend is messy, AI just amplifies the chaos. That is where we come in—ensuring systems are clean, integrated, and efficient.

BENJAMIN STREHL | CEO, USU GMBH



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Any kind of deep tech development is only as good as the use cases you put on top of it. Technology itself rarely delivers immediate value—the value comes when you use it to create value-adding use cases. In this context, we are deeply driving industrial AI.

PROF. DR. NIKO MOHR | CEO, RITTAL



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▶ with many of its customers. Raspberry Pi has also begun selling chips standalone and for the first time, expects to sell more chips than boards this year: “The interesting journey is becoming a semiconductor company,” says Dr. Eben Upton CBE, Founder & CEO. “Over the next decade, we will probably become a company with co-equal electronics and semiconductor businesses.”

The nascent field of photonics offers an especially exciting approach to new chip and server architectures. Computing with light (photons) is faster, carries more data and dissipates less heat than using electrons. In July, Stuttgart-based photonics company Q.ANT GmbH switched on the world’s first operational photonic processor. “Across the U.S., Europe and China, patent activity in photonics is neck and neck. Everyone knows the computer ecosystem must change in the next five to seven years,” says CEO Michael Förtsch. Will these low-temperature systems threaten ROI for data center operators who have invested in expensive liquid cooling technologies? Prof. Dr. Mohr does not think so: “Photonics is certainly disruptive, but it will require significant further development and investment before it can be industrialized and commercialized. Over the next three years, I do not see it as a major disruption,” he says. And for all its promise, photonics is not a panacea. “For now, photonics should be viewed as a complementary technology rather than a comprehensive solution,” cautions AEM’s Kabbani.

Digital transformation: Boardroom mandates and agentic AI

Advanced chips are enabling a universe of new AI applications, and boardrooms are clamoring to implement them. “For the last five years, every major event – whether Gartner, Forrester, or FinOps – has featured AI heavily. CIOs have the opportunity to lead company-wide transformation,” says Benjamin Strehl, CEO of USU GmbH. Organizations in all sectors are most likely to use generative AI – AI that generates text, images, or ideas from data – in marketing and sales, but adoption elsewhere varies

by industry. For example, it’s prevalent in service operations in media and telco, software engineering in tech, and knowledge management in professional services (McKinsey). Strehl points out that beneath the hype, the reality remains uneven: “Most companies have a chatbot here, an invoice scanner there – but real, scaled adoption remains rare.” Often, data organization is the first barrier. “It must be consolidated and organized properly. Fragmented or inconsistent data will not yield meaningful AI insights,” says Emil Eifrem, CEO of Neo4j, a world leader in graph database systems. But beyond data quality, EY’s APAC Managing Partner Patrick D. Winter stresses that “infrastructure and governance around AI implementation, and clear, measurable ROI targets” are critical for success. To date, EY has invested \$400 million in AI upskilling, with nearly 80 percent of staff now using AI.

The latest leap is agentic AI – software systems that don’t just respond, but deduct, plan and act. The hype level for this is high: “Agentic AI is everywhere – you see it on every billboard along Highway 101 in the Bay Area,” says Vijay Guntur, CTO of HCLTech. Tanuja Randery, EMEA Managing Director for AWS, calls AI agents the year’s biggest trend and says they can “completely reimagine complex processes”. Project management platform Teamwork.com is launching a “gallery of AI agents”, like virtual executive assistants or traffic managers. “Customers will essentially onboard an AI agent, just like they would a new employee,” says Daniel Mackey, CEO. AlayaCare already is piloting agentic systems in home-based care: “We have introduced AI agents that manage intake, visit rescheduling, and billing autonomously. Only 50 to 60 cents of every dollar in home care reaches the frontline caregiver. With effective AI automation, we could hit 70 to 80 cents per dollar,” says Adrian Schauer, founder & CEO.

Edge AI vs Cloud

One of the biggest new demand drivers for AI hardware is Edge AI – essential for robotics and autonomous driving, where split-second responses are vital. Unlike cloud AI, it runs inferences locally near devices and sensors, cutting reliance on servers. “We are reaching a tipping point where the capabilities previously only available in server-class hardware are now being integrated into small, fanless devices. For instance, we are working on building the world’s smallest audio system-on-module,” says Sameer Sharna, AVP of MediaTek’s IoT unit.

That compact power is spurring new types of devices. LG Electronics, for example, is embedding ‘Affectionate Intelligence’ in home appliances, which “empathizes” with users and delivers “hyper-personalized lifestyles where devices and services harmonize to transcend mere physical locations,” according to Head of Global Customer Strategy Division Alexio Rhee. Meanwhile, Arm is putting SLMs in cars: “One of our partners is working on replacing the user manual with Gen AI... you can talk to your car: ‘What does this warning light mean?’” says Suraj Gajendra, VP of Automotive. NVIDIA has launched DGX Spark, a desktop supercomputer priced under \$500. “And Sam Altman is reportedly investing \$6 billion with Jony Ive to design a secretive, AI-powered personal device,” says Frankwell Jyh-Ming Lin, Founder and CEO, Andes Technology. “Everyone is exploring AI-powered devices that run LLMs locally. If they crack it, the market will



PASCAL GAUTHIER | CEO, LEDGER

Both AI and quantum computing pose significant cybersecurity threats, but they also enhance our ability to protect against them.



FREDERIK GREGAARD | CEO, CARDANO FOUNDATION

Agentic AI is poised to become the “Google Maps” for blockchain, demonstrating blockchain’s value, even though it will not necessarily be the focus. By combining blockchain and agentic AI, we can prevent monopolistic control and safeguard consumer data.



GRÉGORY LALOY | IOT PRODUCT LINE DIRECTOR, THALES

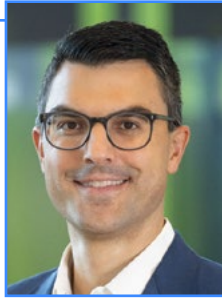
Post-quantum cryptography is a crucial area of interest for us, as we see more powerful computers capable of carrying out attacks.

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STEFAN ENGLERDER | CEO, ENGEL GROUP



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The future of home care lies in agentic AI. By embedding intelligence into everyday workflows, we can shift resources to the frontline, improve outcomes, and redefine what innovation in healthcare really means.

ADRIAN SCHAUER | FOUNDER & CEO, ALAYA CARE



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explode.” Khein-Seng Pua, CEO of the Taiwan-based Phison Electronics, says Asia outstrips the world in developing Edge AI: “Taiwan and Malaysia are leading. India is booming... The U.S. is slow. Europe is nearly inactive. Developers there have been conditioned to build on cloud infrastructure. In Asia, we have built for the edge.” But in Europe, others would push back on that claim. “Edge AI is the standout innovation for 2025,” says Prof. Dr.-Ing. Axel Sikora, chairman of the Embedded World Conference in Germany. France-based STMicroelectronics has already made it a priority: “We expect that by 2030, close to 10 percent of microcontrollers will use AI from literally zero today. Edge AI will be a huge volume business, as opposed to high-end, power-hungry AI chips,” says Aidoune.

Smart manufacturing and robotics: From 2 percent gains to 80 percent

Edge AI is having a radical impact in the industrial sector, where autonomous robots are transforming factories. “In manufacturing, a 2–3 percent efficiency gain used to be huge. Now, in AI projects, we are seeing 15–80 percent improvements,” says Berret from Roland Berger. “In the next five years, the autonomous-driven machine will become standard, particularly in combination with remote access and management,” says Stefan Engleder, CEO of ENGEL Group, which is preparing to launch a self-driven, AI-supported injection molding machine. Boston Consulting Group forecasts that 60 percent of global factories will be “lights-out capable” by 2035, driven by robotics and AI agent adoption. “We believe the breakthrough will come with the development of humanoid robots,” says Mats Gökstorp, CEO of SICK AG. Ali Ors, Global Director of AI Strategy at NXP Semiconductors, calls the “big move” towards humanoid robots “fascinating” and adds, “we are shifting from science fiction into real technology.” Design and safety questions remain unresolved, however, and Dr. Hoe Seng Ooi, CTO of NexCOBOT, warns that trust is paramount: “Humanoid robots are mobile and battery-powered. The key issue is trust. You do not want a Terminator scenario in your house – you must be able to shut the robot down safely anytime.”

Cybersecurity: Fighting AI with AI

As digitization accelerates us into a world of heightened productivity, vulnerabilities are multiplying in step. Digital identity exemplifies this mix of promise and peril: Picture gliding through an airport gate, immigration, and hotel check-in without ever pulling out a document – it’s all blissfully convenient and efficient. “But then there is the darker side. What happens if your digital identity is stolen? You could be locked out of your digital life entirely,” says Ralf Wintergerst, CEO of Giesecke+Devrient. And AI is redrawing that threat landscape. Scale is the new weapon, says Mike Beck, CISO of Darktrace: “AI is enabling attacks to be scaled in ways we have never seen before. Attackers can now quickly codify against vulnerabilities and deploy it at an incredible pace.” SoSafe, whose recent study found that 50 percent of respondents had experienced AI-powered social engineering, is seeing LLMs in phishing, fraud and misinformation. “Deepfake CFO scams are already happening, and as agentic models gain internet access, the risks only grow,” says CEO Niklas Hellemann. The global cost of cybercrime is projected to reach US \$10.5 trillion in 2025,

according to Deloitte. “Cyber risk is by far the fastest-evolving risk,” agrees Paolo Mantero, Chief Strategy Officer of Zurich Insurance Group. “Most attacks target small businesses, with 90 percent of insurance claims coming from SMEs.” That pressure is forcing security doctrine to evolve: “There is a clear shift toward zero-trust security,” says Tom Gillis, SVP of Cisco. Yet even AI defense is uncertain. “Unlike traditional applications, AI’s non-deterministic nature makes its behavior unpredictable. To address this, we are investing heavily in AI defense: using AI to protect AI,” he adds.

The tech hack: Think cross-field

For the C-suite, the playbook is simple but brutal: bet radical on AI, stay ruthless on data, cultivate culture and never blink on security. “Do not fear AI,” says Greg Berard, CEO, Peller Technologies. “It is a tool that adds value and can help businesses stay ahead of competitors. Understand its potential impact on operations, governance, and security, and embrace it.” And real innovation, argues USU GmbH’s Strehl, comes from human dialogue. “The best ideas do not come from ChatGPT – they come from conversations between experts in different fields. Cross-industry awareness and constant dialogue – that is the edge.”

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