European Deep-Tech Lab Challenges Frontier AI with 'Sovereign' Brain-Inspired Engine Operating at 1/50th of the Cost

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Today, Verkko Robotics, a deep tech European AI Research Lab, unveils VOLTAIC, a spiking neural inference engine designed to learn continuously, resist catastrophic forgetting, and run at a fraction of the cost and energy of leading large multi-modal models. A breakthrough that could challenge the economics of the current frontier AI industry. And provide the foundation for true AI sovereignty.

VOLTAIC comes at a moment of intense scrutiny of frontier AI's resource demands and reliance on external and large US AI providers. It is engineered for extreme energy efficiency: its architecture enforces sparse networks, meaning most of the neurons remain inactive at any given moment. This drastically lowers power consumption, making it well suited to deployment on private hardware.

In independent continual learning benchmarks, VOLTAIC achieved a catastrophic forgetting rate of just ~1.2% on Core50 and 77% accuracy on Split ImageNet-1K - 14 points above the previous record set by other systems - results that place it at the top of its class, delivered at a fraction of the energy cost of conventional transformer-based systems.

Verkko's internal benchmarks place VOLTAIC's cost at 1/50th per query, against a comparable query on leading LLMs. While currently in active development ahead of its Q4 2026 release, these initial validation metrics signal a massive shift away from heavy transformer models.

VOLTAIC is the work of Giancarlo Cobino, Verkko's Chief Scientist and Co-Founder, a frontier researcher in artificial intelligence with over 20 years of experience at the intersection of neuroscience-inspired computing and enterprise AI.

"By shifting from dense, brute-force computation to sparse, adaptive threshold dynamics, we have built an architecture that learns continuously in real time and resists catastrophic forgetting. This efficiency allows the system to adapt to personal behaviour and individual user habits locally, without massive power demands," says Cobino.

Commenting on the launch, Dr. Fabio Vallone, a PhD physicist and researcher at the University of Pisa and the highly regarded Department of Excellence in Robotics & AI at Scuola Superiore Sant'Anna, one of the world's leading institutes for advanced robotics and artificial intelligence, noted: “Voltaic represents a significant breakthrough in continual learning by directly addressing the challenge of catastrophic forgetting, ushering in a paradigm shift in how we train adaptive systems. By introducing novel methodologies, the Verkko Robotics team is unlocking previously unexplored avenues for practical applications and redefining human-AI interaction. This development has the potential to fundamentally reshape our relationship with intelligent machines, and its long-term implications are incredibly promising.”

Sovereignty is a growing concern in Europe. By default, queries sent to most US-based AI providers involve a transfer of data outside EEA jurisdiction, a dependency that contractual safeguards can manage but not eliminate. On 3 June 2026, the European Commission unveiled its European Technological Sovereignty Package. Commission President Ursula von der Leyen stated: "We cannot afford to depend on others for the technologies that keep our hospitals running, our energy grids stable and our services secure." By reducing dependency on massive cloud infrastructure, VOLTAIC is designed as a foundation for sovereign AI.

The prevailing approach to AI, built on transformer architecture, requires billions of dollars to build new-generation models - an exercise that only the largest tech companies can afford. VOLTAIC is built on a different architecture entirely: Hierarchical Synaptic Consolidation (HSC), a proprietary biologically inspired design that draws on how the human brain retains and consolidates memory. The system retains prior knowledge as it learns, so that knowledge compounds rather than degrades. Where transformer models forget, VOLTAIC remembers.

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VOLTAIC is being developed for consumers and large, complex organisations - enterprises running hundreds of disconnected systems, where institutional knowledge is lost across departments and every query is sent to an external AI provider, raising sovereignty concerns. It is in environments like these, particularly in regulated sectors such as finance, legal and aerospace, that VOLTAIC's continuous memory is designed to deliver the most value. Unlike conventional models that must be retrained to incorporate new knowledge, VOLTAIC learns in real time, compounding institutional intelligence rather than discarding it.

Stephen McCreath, co-founder and CEO of Verkko Robotics, said: "The AI industry has been locked in an arms race of bigger models. With VOLTAIC, we aim to break that paradigm. As a consequence of what we are doing, in the future we will be less reliant on large data centres. This is the most exciting time in development, both within Verkko Robotics Ltd and artificial intelligence as we move towards continuous learning."

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