Press Release

Groundbreaking chip patents:
Techifab develops platform with reconfigurable memristors and transistors as the key to neuromorphic computing

- 90% energy savings, 400x faster processing speed for crucial matrix multiplication
- Key combination of memristors and transistors for neural networks, quantum-safe encryption and industrial sensor technology

Dresden (Germany), April 8th, 2025 – DeepTech start-up Techifab has filed multiple patents for its novel TiF platform technology - a scalable architecture that combines both storage and processing of data in a single component and is compatible with CMOS manufacturing processes. Based on a bismuth iron oxide, the TiF platform technology brings reconfigurable memristors and transistors to industrial applications for the first time and addresses the matrix-matrix multiplication operation, which is essential for AI systems but is extremely resource-intensive.

90% energy reduction, 400 times faster processing speed

Matrix multiplication is the central computing operation of modern AI systems and at the same time the largest energy consumer in data centers. Reconfigurable memristors and transistors make it possible to adapt the chip design directly to the mathematical structure of matrix multiplications - the foundation for specialized AI hardware that goes far beyond what classic GPUs, APUs or TPUs can do today. Test series on recognized simulation platforms show: The TiF platform technology can achieve energy savings of up to 90% and a 400- times higher processing speed compared to the classic von Neumann architecture.

“We are talking about a complete paradigm shift in chip architecture,” says Prof. Dr. Heidemarie Krueger, co-founder of Techifab GmbH. “The reconfigurable memristors and transistors of our TiF platform technology are not small incremental optimizations, but enable hardware to be designed for specific tasks and domains - be it for neural networks, quantum-safe encryption or industrial sensor technology.”

Techifab's path to commercial scaling

With this innovation, the start-up funded by the German Federal Agency for Leap Innovations (SPRIND) is following a clear path towards the commercialization of its invention. In addition to the search for further investors, the focus in the short term is on developing the first commercially viable applications.

“In the medium term, we are aiming to work closely with global Integrated Design Manufacturers (IDMs), Design Enablement Providers and other R&D collaborations. Our goal is to achieve highly scaled integrations in AI data centers before 2030. In addition to the use in AI infrastructures, we also see enormous potential in edge computing (e.g. for autonomous driving),” comments Guy Vroemen, CEO of Techifab GmbH.

About Techifab

Techifab was founded in 2021 by Prof. Dr. Heidemarie Krueger and Stephan Krueger and develops the platform technology for neuromorphic chips based on a novel semiconductor material (TiF platform technology). The start-up from Germany's Silicon Saxony region addresses key weaknesses in traditional semiconductor architectures and offers a new, highly energy-efficient alternative for AI, robotics, cyber security and communication technologies.
Techifab currently employs around 50 people at its Dresden headquarters. With 24 registered patents and over EUR 20 million in investments to date, the company is one of the most promising representatives of the European DeepTech scene. The first memristor components, including administration software, have been available as a proof of concept in the Techifab online store since 2024.

Further information: https://techifab.com