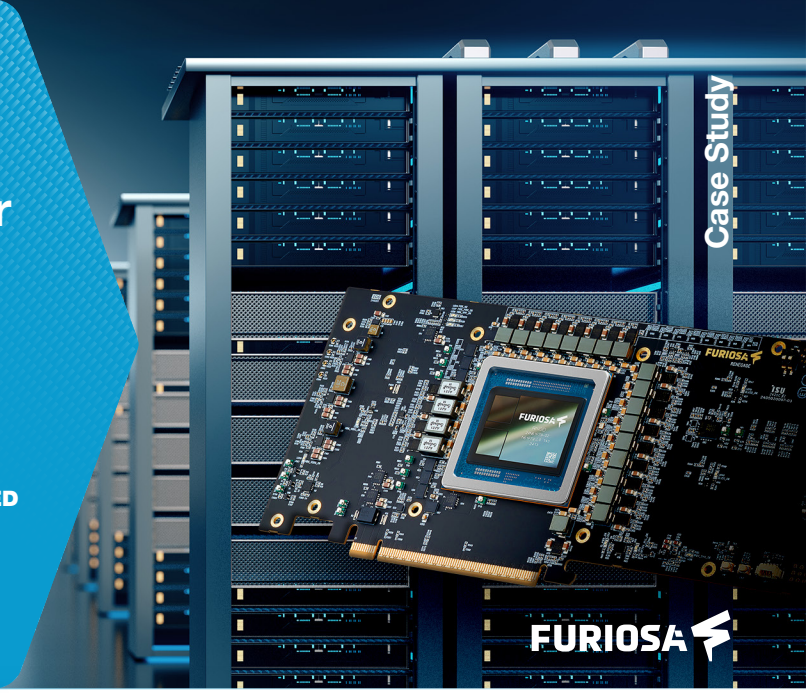
proteanTecs

FuriosaAI Enhances AI Processor Performance per Watt Through Advanced In-Chip Monitoring

Learn how an innovative datacenter chipmaker leveraged proteanTecs' deep data analytics to achieve superior visibility during NPI



ACCELERATED MASS PRODUCTION READINESS
While optimizing performance per watt

STRENGTHENED COMPETITIVE EDGE
With in-chip monitoring

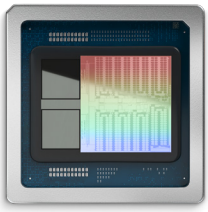
The Customer

FuriosaAI is a semiconductor company building a new kind of AI chip for data centers and enterprise applications.

The company's flagship product, RNGD (pronounced "Renegade"), accelerates inference with advanced large language and multimodal models and is currently sampling with customers. Built on a 5nm process with HBM3 memory and Furiosa's innovative Tensor Contraction Processor architecture, RNGD delivers an unmatched combination of performance, programmability and energy efficiency compared to traditional GPU solutions.

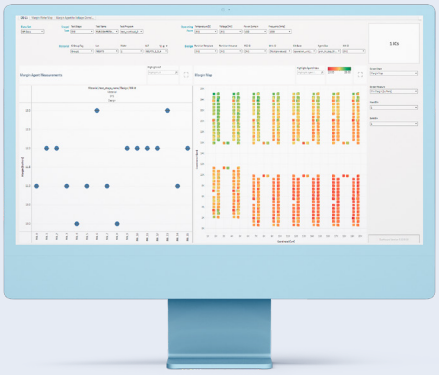
The Objective

Enhance product visibility during New Product Introduction (NPI) with on-chip monitoring



Furiosa aimed to enhance its monitoring and analytics capabilities upon receiving dies from the ASIC house, mainly focusing on workload-aware assessment of timing margins, temperature and voltage.

This addition was meant to facilitate informed decisions based on deep data analytics and predictive insights that would push the company's already high power/performance standards even higher.



Examining different areas within the chip in the proteanTecs analytics platform shows the spatial signature.

Advanced Analytics Based on In-Chip Monitoring for Process Characterization

Furiosa integrated proteanTecs' on-chip agents and analytics platform to help ensure every RNGD AI processor meets rigorous PPW requirements. The company gained visibility into the process correlation to simulations, timing margins, functional coverage, power integrity, and on-die variation while enhancing the product's quality and reliability profile.

Two capabilities were among the results that Furiosa achieved:

Use Case 1: Timing Margin Characterization

proteanTecs' on-chip Margin Agents and dedicated ML algorithms provided detailed insights into the performance variations between different sections within the chip while applying functional workloads. By gaining a comprehensive parametric understanding of the chip's spatial margin map, Furiosa was able to to build confidence in the design envelope and to ensure optimal PPW.

Use Case 2: DC/High-Speed Voltage Fluctuations and Thermal Monitoring

With proteanTecs' low-area, digital VDroop sensors integrated across the chip, Furiosa could identify voltage fluctuations and take action to ensure stable performance under varying workloads. Furiosa also leveraged high-coverage temperature monitoring, which can provide additional insights into thermal conditions at both chip and system levels.

The Results

Strengthening the leadership position: Gaining parametric visibility in production has helped Furiosa cement its place at the forefront of the competitive semiconductor market.

Capitalizing on deep insights: Beyond NPI, Furiosa will utilize in-field monitoring data for continuous optimization, ensuring optimal PPW. Furiosa's customers not only gain a top-performing processor, with best-in-class specifications, but can also leverage the integrated monitoring capabilities to improve the performance and reliability of their own systems.

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