

alt.ai begins construction of LLM-based Computational Architecture Generation Model

Accelerating industry-specific GPU development, ushering in an era where AI creates its own computational Infrastructure

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/EINPresswire.com/ -- alt Inc.

(<https://alt.ai/en/>, head office: Minato-ku, Tokyo; CEO: Kazutaka Yonekura)

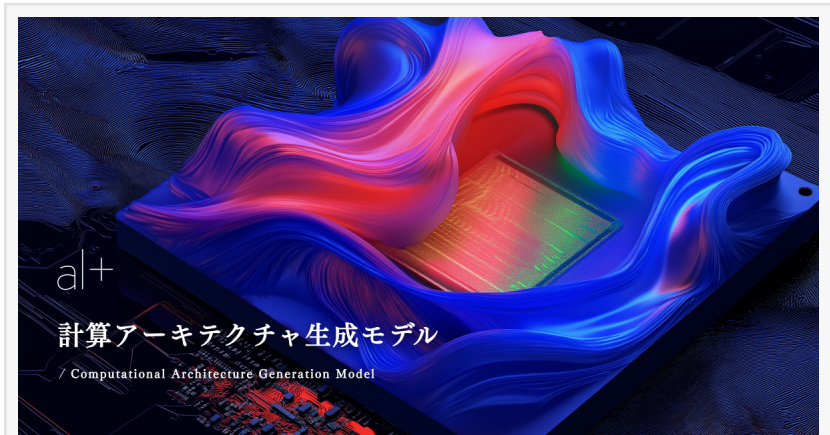
has initiated a joint research project with Professor Duc-Minh Nguyen (Vice Dean, School of Electrical and Electronic Engineering, Hanoi University of Science and Technology), a world-renowned authority on computer architecture. Through this research, we aim to utilize large

language models (LLMs) to transform the design process for industry-specific GPUs, reducing traditional GPU design costs by approximately 80%—up to \$22.6 billion per year.*

* Annual savings of up to \$22.6 billion: Our engineering team calculated the combined annual development costs of the world's major fabless GPU manufacturers. After estimating the impact that automation through LLM will have on the GPU design process and the cost savings, we aim to achieve annual savings of approximately \$22.6 billion. (As of February 14, 2025, based on in-house research.)

□ The future of GPU design, transformed by LLMs

As AI workloads have grown more diverse in recent years, it has become more difficult to achieve optimal computation with conventional general-purpose GPUs. In fields such as high-performance computing, autonomous driving, medical AI, and edge devices, custom chip designs for specific applications are required. However, the current GPU design process is complex and costly, and chip development for specific applications remains a high barrier for many companies.



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In this project, we will develop “Computational Architecture Generation Model” using LLM to solve the following problems:

- LLM-led GPU architecture design

- LLM analyzes the workload of each industry and generates the optimal architecture

- Whole process is automated, from initial design through logical design, circuit layout, and prototyping

- High-efficiency hardware/software co-design

- Leverages Professor Minh's expertise in SRAM-based Spiking Neural Network designs to optimize software/hardware integration

- Dramatically reduces the number of prototypes required for silicon mounting

- Cuts design modification costs and time through AI simulation

- Decreases foundry burden by reducing silicon prototype iterations

- Fundamentally transforming GPU design cost structure

In 2024, fabless GPU design costs totaled approximately \$28.3 billion worldwide. Traditional GPU design processes face challenges including engineer-dependent processes, inefficiencies in the prototyping and verification phases, and difficulties in determining optimal design specifications.

By leveraging LLMs, this project will dramatically reduce the costs required for GPU development, bringing about the following benefits:

- Potential annual cost savings of up to \$22.6 billion through design process automation

- Compression of GPU design costs to just \$5.7 billion, if 80% cost reduction is achieved

- Lower barriers for new chip development, enabling diverse custom GPUs for various applications

The initiative aims to democratize GPU development, enabling application-specific optimizations to be achieved quickly and at low cost.

- alt as project leader: strategic research linked to national-level AI technology development

We envision a future in which AI and robotics design and optimize their own computing infrastructure without human intervention. Although GPUs are essential computational infrastructure for AI, their design and development processes remain inefficient and rely on traditional methods. By revolutionizing the way GPUs are designed, we're building the foundational technology for AI self-evolution and self-adaptation.

alt has been one of the few LLM development companies selected to receive national funding through the GENIAC program. In developing our flagship P.A.I. (Personal Artificial Intelligence) technology and expanding the advanced applications of LLMs, we're taking on the challenge of "AI-based hardware design automation," in which AI itself optimizes computing infrastructure.

Professor Minh has received global acclaim for his research on optimizing the design of next-generation AI architectures, having won the 2025 "Code-a-Chip" prize for his "Software/Hardware Co-Design for a SRAM-Based Spiking Neuron Network" project. By combining Professor Minh's expertise in software/hardware co-design with our LLM breakthroughs, we aim to remove bottlenecks in traditional GPU design and bring about a paradigm shift in computing architectures.

□Comment from Professor Duc-Minh Nguyen

LLM-based GPU design has the potential to revolutionize conventional hardware design. In this project, we aim to establish a method to more quickly and precisely design GPUs optimized for each industry.

□About Professor Duc-Minh Nguyen□

□<https://scholar.google.com/citations?hl=en&authuser=1&user=zuj2xSwAAAAJ>□

□For inquiries about LHTM-2/LHTM-OPT/GPT and other LLM solutions

□<https://alt.ai/aiprojects/gpt/>□

□About alt Inc.

Founded in November 2014, alt is a company that "aims to free people from unproductive labor" by creating "P.A.I." (Personal Artificial Intelligence) and AI clones. In addition to AI GIJROKU, a communication intelligence that utilizes speech recognition technology born from the development of an AI dialogue engine, we also develop and provide products, such as altBRAIN, CLONEdev, and altTalk, that provide solutions to various business issues through PoC (Proof of Concept).

<https://alt.ai/en/>

<Media Inquiries to:>

Misako Nishizawa

alt Inc.

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