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ALTERNATIVE THINKING ABOUT INVESTMENTS

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Portfolio News: Groq's Acquisition of Definitive Intelligence

A Reflection of Specialized Hardware for Specialized Software

Groq, a leader in generative AI solutions, has recently acquired Definitive Intelligence, a Morgan Creek Digital portfolio company specializing in intelligence services, utilizing API and generative AI technology to enhance enterprise data utilization.[1] This strategic acquisition is aimed at expanding Groq's reach and capabilities in the AI sector.

Sunny Madra, the former CEO of Definitive Intelligence, will now head Groq's new business division called GroqCloud. This division is set to democratize access to Groq's Language Processing Unit (LPU) Inference Engine, fostering the development of AI applications.[2] GroqCloud provides developers with a comprehensive toolkit, including documentation and code samples, to facilitate innovation. Under Madra's leadership, the GroqCloud team is committed to enhancing capacity, and efficiency, and establishing strategic partnerships.

Groq boasts a team of ex-Googlers, including Jonathan Ross, a key figure behind Google's Tensor Processing Unit (TPU) project.[3] Their expertise has translated to its LPU Inference Engine developments, known for its excess speed and efficiency in language processing tasks. The engine is designed to deliver low latency and energy-efficient performance at scale, catering to the needs of customers running Large Language Models (LLMs) and other generative AI applications.

History of Tensor Processor Unit and Specialized AI Chips

A TPU, an Application-Specific Integrated Circuit (ASIC), represents a hardware accelerator developed by Google out of necessity for advanced hardware to support its extensive machine-learning tasks.[4] These units are integrated with TensorFlow, Google's machine learning open-source framework introduced in 2015, facilitating the prompt execution of AI models.[5]

The TPU's value lies in its adeptness at executing complex mathematical operations that are foundational to specific AI tasks markedly faster than its general-purpose

counterpart units, CPUs, and its redefining of AI computational architecture. Moreover, TPUs are engineered for high-volume, low-precision computation, exhibiting improved efficiency and performance for machine learning applications and neural network operations like matrix multiplications (used for feed-forward and backpropagation, which are input and training computations), image recognition, and natural language processing.[6]

TPUs, as ASICs, epitomize the specialized hardware approach, offering tailored efficiency for tensor computations.[7] Their architecture, featuring Matrix Multiply Units (MXUs) and High Bandwidth Memory (HBM), is optimized for parallel data processing, ensuring high throughput and reduced power consumption.[8] TPUs have undergone several iterations, and perhaps most notably, the Google Cloud TPU v5e, which underscores the importance of custom AI accelerators for the dual purposes of training and inference across a diverse array of applications.[9] Applications, largely enterprise-grade, range from chatbots, code, and media content generation to synthetic speech, vision services, recommendation systems, and personalized models.[10]

Conclusion

The Groq team will leverage Sunny Mandra and his colleagues to support the GroqCloud LPU scaling efforts, offering enterprise-grade AI accelerators for managing language model applications with large compute and memory bandwidth requirements. Morgan Creek Digital welcomes Groq as part of its portfolio and believes that its vision aligns with a central tenet of our thesis; the convergence of powerful processors with generative AI has the potential to bring about major changes and presents prospects for wealth generation. Exponential software of the digital age requires exponential hardware, and with recent advancements in processor technology, characterized by innovations in materials, transistor designs, and specialized architectures like LPUs and TPUs, there is new promise for heightened computational power and energy efficiency. From an investment perspective, the interconnectedness of advanced hardware and software offers unique opportunities reminiscent of the "pick-and-shovel" investment strategy.

Developers of Generative AI, with their emphasis on content creation models, also stand to benefit from the synthesis of more sophisticated models, such as the Generative Pre-trained Transformer (GPT) series, which is feasible because of enhanced processing capabilities (like Nvidia GPUs). This evolution translates to tangible applications, such as creating high-fidelity synthetic media and virtual environments for gaming and simulations. In healthcare, the synthesis of synthetic medical images aids in training machine learning algorithms, thereby advancing Generative AI's capabilities to generate diagnostic content. In gaming, the fusion of advanced processors and generative AI can produce immersive virtual environments that rival reality, the goal of Web3 gaming. Both private and public markets are marked by strategic opportunities, as companies specializing in advanced processor development, particularly those tailored for AI applications, hold a pivotal position in the new wave of digital technologies.

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[1] https://www.prnewswire.com/news-releases/groq-acquires-definitive-intelligence-to-launch-groqcloud-302077413.html

[2] Ibid.

[3] https://www.forbes.com/sites/amyfeldman/2021/04/14/ai-chip-startup-groq-founded-by-ex-googlers-raises-300-million-to-power-autonomous-vehicles-and-data-centers/?sh=47382f6265e3

[4] https://www.ai-event.ted.com/glossary/tpu-(tensor-processing-unit)

[5] Ibid.

[6] https://cloud.google.com/tpu/docs/intro-to-tpu

[7] Ibid.

[8] https://semiengineering.com/knowledge_centers/integrated-circuit/ic-types/processors/tensor-processing-unit-tpu/

[9] https://cloud.google.com/tpu/docs/v5e-inference

[10] Ibid.

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those associated with traditional investments.

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