

## **Think Silicon to introduce a new Inference Micro GPU Architecture based on RISC-V at Linley Fall Virtual Processor Conference**

ATHENS, GR, SAN JOSE Calif. Think Silicon S.A, the leading provider of ultra-low power GPU IP for embedded systems, today announced that Dr. Iakovos Stamoulis, CTO of Think Silicon will be present at the technology industry's premier processor conference, the Linley Fall Virtual Processor Conference. The conference will be held on October 20<sup>th</sup> – 22<sup>nd</sup> and 27<sup>th</sup> – 29<sup>th</sup>, 2020 and will feature high-quality technical content from leading semiconductor companies worldwide.

*Think Silicon will introduce NEOX™ a new inference Micro GPU Architecture based on RISC-V ISA @LinleyGroup fall virtual processor conference*

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"Industry demand for AI performance has skyrocketed over the last few years driven by rapid adoption from the data center to the edge. This year's Linley Fall Processor Conference will feature our biggest program yet and will introduce a host of new technology disclosures and product announcements of innovative processor architectures and IP technologies," said Linley Gwennap, principal analyst and conference chairperson. "In spite of the challenges posed by the pandemic, development of these technologies continues to accelerate and we're excited to be sharing these presentations with a global audience via our live-streamed format."

Think Silicon extended its IP portfolio with a new inference Micro GPU Architecture based on RISC-V ISA suitable for AI-Vision and graphics tasks to enable different classes of performance, efficiency, and features for application and deeply embedded uses. Designed for scalability, Think Silicon Core IP can be tailored to workload requirements through the highly configurable parameters of the architecture.

### **Extending AI SoC design possibilities from bare metal to Linux**

The combination of up to 64 scalable shader cores opens a wide range of design points and applications from bare metal/RTOS to Linux systems. This new processor core features a combination of Graphic Vector RISC-V ISA extension and customized user defined instructions. According to Dr. Iakovos Stamoulis, CTO Think Silicon: "*The NEOX™ architecture is the most flexible system we have ever developed. It includes AI specific ISA extensions, SIMD Vector in variable length datatypes including 8-bit and optionally Graphics ISA Extensions/Coprocessors: Unified Shader Architecture, Tile Based Rendering, Color/Vertex, Vector Support and contains dedicated hardware modules such as rasterizer, texture unit, tile management unit and texture caches.*"

He continued: “*Supporting a dedicated interface allows SoC architects to augment the instruction set with user defined instructions to enable product differentiations and the ability to create custom unique designs.*”

## **Creating an Ecosystem for Application Development**

New architectures require access to development environments to create and optimize software. The SDK provides open source and proprietary tools for analyzing, visualizing, converting, compressing, and deploying on pre-trained and post-trained AI/ML/NN models on the NEOX™ architecture. The AI SDK is based mostly on TensorFlow with converters from other frameworks, and it supports the most widely used models.

The tools allow developers to perform various steps in importing models, such as conversions from commonly used neural formats — Model Visualizer, Performance analyzer, memory requirements estimation model compression and model analysis — until the desired balance between ‘accuracy-performance-memory’ is achieved.

### **A New Paradigm for Parallel Processing** (*actually a very old one*)

Many Parallel Programs are coded using POSIX pThreads or OpenMP. A Common ISA between CPU and GPU allows for threads to be offloaded to lite-weight GPU threads.

NEOX™ in summary:

- RISC-V based ISA suitable for Graphics /AI and Vision Tasks
- Scalable Design: 4-64 cores targeting from small IoT device
- Multithreading: Memory-latency tolerant and Efficient pipeline
- Leverage RISC-V ecosystem and Tooling (GCC/LLVM)
- AI Inference Toolkit: Model Conversion, Analyzer, Profiler, Optimizer.
- Low Power: Small Design with Ultra Low area and Gate Count
- Extensible: User defined custom Instructions

Registration for The Linley Group Fall Virtual Processor Conference is free and open [now](#) for qualified registrants. The conference is intended for chip designers, system designers, equipment vendors, OEM/ODMs, service providers, press, and the financial community.

## About Think Silicon

Think Silicon S.A., an Applied Materials company, is the leading provider of ultra-low power 2D & 3D Graphics, AI and Video IP for smart IoT/edge connected end nodes such as display and camera devices and embedded systems. At Think Silicon our innovation enables the rapid deployment of multitude applications on resource-constrained devices while significantly improving battery life, save power to shape a more sustainable future in graphics, vision and AI processing. Think Silicon S.A. headquarters and development center is based in Athens and Patras Greece with sales and technical support offices in North America, EMEA and Taiwan.

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