SiMa.ai Palette

Software Suite

Highlights

SiMa.ai's Palette® Software Suite accelerates AI development cycles and simplifies complex workflows so customers can successfully deploy their applications into production quickly. Palette is a complete software solution for any Physical AI workflow, delivering industry-leading performance and unmatched ease of use. The integrated agentic development environment simplifies your design process by automatically configuring model requirements and orchestrating SiMa.ai's hardware in the background. This slashes application development from weeks or months to days, automating complex compute processes and ensuring a seamless transition from other vendors' solutions to SiMa.ai. Palette enables concurrent software execution on Modalix™ MLSoC hardware, including the ability to run multiple Docker containers at once.

Palette Development Flow: Develop, Optimize, Catalog, Execute.

Develop: Palette Neat

As an AI developer, you gain a powerful, fully open-source environment with Palette to accelerate via agentic workflows. Its structured repository, practical examples, and reusable skills empower you to quickly generate working applications while retaining full ownership and control over every stage of your code's execution. Palette includes:

- **Palette SDK:** Accelerate your entire development life cycle with faster compilation for SiMa.ai Modalix boards and seamless integration into existing CI/CD workflows.
- **Developer Center:** A comprehensive guide for seamless integration.
- **Insight:** Gain real-time visibility into pipeline outputs and application performance through detailed profiling and visualization.

STEP 1

Load a 'Model'

Start with a compiled model package and let Palette Neat expose it as a reusable application building block.

```
neat::Model model(
   "resnet_50_mpk.tar.gz");
auto result = model.run(rgb);
```

Runnable and App-Ready Component

STEP 2

Compose a 'Graph'

Assemble model stages, inputs, outputs, and application logic into one coherent application.

```
neat::Graph graph;
graph.Add(neat::nodes::Input());
graph.Add(model);
graph.Add(neat::nodes::Input());
```

Runnable and App-Ready Component

STEP 3

Build and 'Run'

Execute the composed application with Palette Neat runtime controls so it performs efficiently on SiMa.ai MLSoCs.

```
auto runner = graph.build();

auto out = runner.run(
   input_tensors);
```

Runnable and App-Ready Component

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Optimize: Model Compiler

- **Unified AI Support:** Achieve optimal performance and seamless integration across all your AI workloads using Model Compiler, including the latest Deep Neural Network (DNN) models and Generative AI (GenAI) models.
- **Heterogeneous Compute Optimization:** Maximize efficiency and performance by automatically partitioning and balancing models across the SiMa.ai Modalix MLSoC's heterogeneous compute resources.
- **Mixed-Precision Acceleration:** Accelerate execution and improve energy efficiency with mixed-precision support (INT8 and BF16) through the on-device mini-pipeline API (C++ on eLxr).

Catalog: Model Browser

- **Project Acceleration:** Access a comprehensive library of pre-optimized models covering common DNN topologies, allowing you to quickly find the right solution for tasks such as object detection, tracking, and classification.
- **Performance Optimization:** Easily evaluate and select models with confidence, as each includes detailed accuracy metrics, performance benchmarks, and key performance indicators (KPIs).
- **Interactive Benchmark Visualization:** Use the interactive Model Browser to showcase real-world performance benchmarks on the Modalix MLSoC.

Execute: Device Manager

- **Streamlined Productization:** Easily verify, package, and securely deploy your entire application, along with all required resources, directly to Modalix MLSoC boards using a single workflow.
- **Complete Lifecycle Management:** Handle all phases of deployment and maintenance, including secure communication and over-the-air updates, ensuring long-term product stability and support.
- **Advanced Debugging and Analysis:** Gain deep visibility into application performance with LogCat, PerfCat, multi-core GDB debugging, and pipeline execution visualization tools to help you quickly identify and resolve bottlenecks.
- **Cross-Platform Development:** Develop and run your applications seamlessly across Linux, Windows, and Mac environments with Palette software support as the Palette software supports all major operating systems.

Contact mlsoc@sima.ai for deployment options.

SiMa.ai

About SiMa.ai

SiMa.ai is a leader in Physical AI, delivering a purpose-built, software-centric platform that brings best-in-class performance, power efficiency, and ease of use to Physical AI applications. The company is focused on scaling Physical AI across robotics, automotive, drones, industrial automation, aerospace and defense, smart vision, and healthcare. Learn more at www.sima.ai.

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