

VectorBlox™ Accelerator SDK v2.0

Accelerate AI Inference Development with PolarFire® FPGAs and SoC FPGAs

Efficient AI Deployment for Embedded Vision and Beyond

The VectorBlox Accelerator SDK 2.0 simplifies AI inferencing on PolarFire® SoC FPGAs, enabling AI engineers to create power-efficient, high-performance solutions for embedded vision and other edge applications. With support for popular AI models and frameworks, it bridges the gap between software-centric AI development and hardware-optimized FPGA deployment.

VectorBlox Key Features

Broad AI Model Support: Pre-optimized support for CNNs like ResNet, YOLO, MobileNet, and custom models. The SDK is compatible with TensorFlow, TensorFlow Lite, ONNX, and OpenVino frameworks.

Seamless Integration with PolarFire SoC FPGAs: Directly leverage the low power, small form factor, and SEU immunity of PolarFire devices for reliable operation in industrial and embedded environments.

Dynamic Model Loading: Load multiple AI models on the same hardware dynamically without reprogramming the FPGA, saving development time.

Bit-Accurate Simulation: Test and validate AI models using software simulators before committing to hardware deployment.

Optimized Neural Network Performance: Advanced tools for quantization and calibration ensure efficient AI inferencing with reduced memory usage and higher throughput.

VectorBlox Advantages

Simplified Development: AI engineers can deploy models using familiar tools and frameworks without needing FPGA design expertise.

Scalability: Supports AI models with varying compute and memory requirements, offering flexibility for future applications.

Reliability and Security: PolarFire FPGAs offer SEU immunity and hardware security features, ensuring robust operation in critical environments.

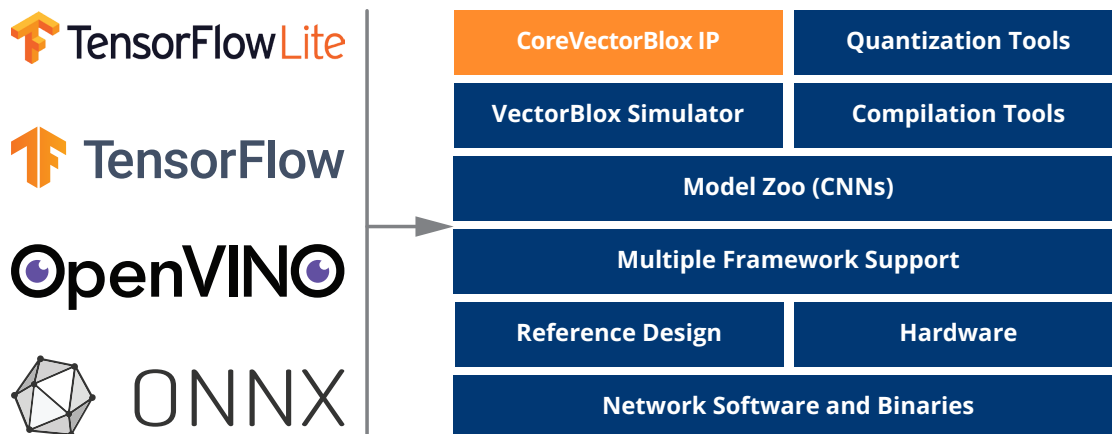
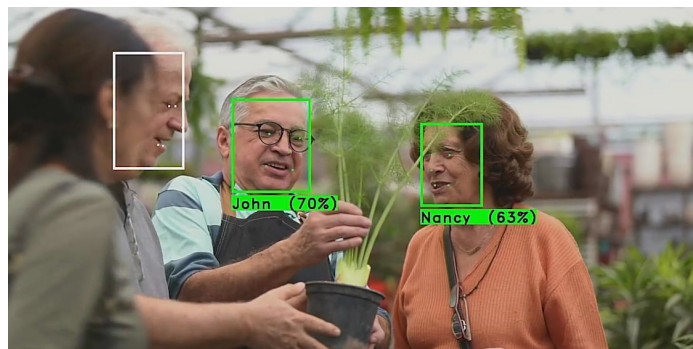


Figure 1—VectorBlox Framework

Applications

Embedded Vision: Real-time AI inferencing for robotics, surveillance, and industrial automation.

Healthcare: High-speed processing for medical imaging and diagnostics.

Autonomous Systems: Reliable AI solutions for vehicles, drones, and factory robotics.

What's New in VectorBlox 2.0

Enhanced AI Model Support: Now with the latest Ultralytics models — YOLOv8 and YOLOv9.

Optimized Runtime Performance: Improved inference times by up to 25% over version 1.4.4 with updated processing pipelines and memory management.

TensorFlow-Lite for AI Embedded Applications: Natively supports TensorFlow Lite INT8 operators.

Excellent Flexibility: PolarFire SoC with a embedded RISC-V cores is ideal for flexible, secure, and power-efficient AI solutions. Its integrated MSS supports Linux and RTOS, while secure boot ensures reliable operation, making it a one-chip AI and vision platform.

Why Choose VectorBlox with PolarFire SoC FPGAs?

Accelerated Development: Leverage pre-optimized CNNs and tools for faster time to market.

Low Power Advantage: Reduce operational costs and ensure performance even in thermally constrained environments.

Compact Form Factor: Integrate high-performance AI processing into space-constrained devices.

Reliability: SEU immunity and robust hardware security features.

VectorBlox Example

Video 1—Licence Plate Recognition (Link)



Learn more

- [VectorBlox Accelerator SDK webpage](#)
- [VectorBlox Accelerator SDK at GitHub](#)
- [PolarFire SoC Video Kit](#)
- [PolarFire SoC Video Kit demo at GitHub](#)
- [CoreVectorBlox IP](#)