

CASE STUDY

OpenVX Infrastructure Implementation

Executive Summary:

The client is Europe based semiconductor firm. They provide custom silicon solutions across different domains like automotive, consumer, multimedia, and video surveillance markets. They also offer technology turnkey solutions to their customers.

The client approached Softnautics to develop OpenVX [machine vision infrastructure](#) for their DSP Core and perform conformance testing for OpenVX compliance. OpenVX is an open, royalty-free standard API for cross platform acceleration of computer vision applications.

The solution is targeted to accelerate the development of machine vision applications with high-definition sensor inputs.

Business Challenges

The client was looking for a platform engineering expert to help them build OpenVX support for their DSP core with simulator environment and optimize vision library functions based on DSP core compute capabilities.

Solution Provided

Softnautics assisted the client by providing OpenVX support for diverse compute architecture to provide an accelerated machine vision ecosystem. Vision applications can be developed for a variety of host processors, including ARM, MIPS, and Intel, and linked to the OpenVX host library, which provides functions for invoking application-specific vision functions. Conformance tests ensure adherence to OpenVX specifications and aid in OpenVX consortium certification.

The solution is suitable for use in high-definition, low-latency [machine vision applications](#).

- ✓ Migrated baseline C functions to customer's DSP core compatible functions
- ✓ Optimized 64+ core vision functions based on DSP compute & memory access capabilities
- ✓ Customized host-accelerator interface development based on shared memory access between host processor & simulator
- ✓ Software data structures design for graph execution dispatch & events
- ✓ Demonstrated DMA (Direct Memory Access) engine utilization for data transfers between global RAM & local memories
- ✓ Established the conformance test suite and invoke conformance tests for all vision functions including their run-time variants to ensure compliance with OpenVX specifications
- ✓ Release package with conformance test suite reports

Tools & Technologies

Platforms

- ✓ Host processor with simulated accelerator

Frameworks

- ✓ OpenVX 1.x

Programming Languages

- ✓ C

Tools

- ✓ IDE & toolchain
- ✓ Simulator
- ✓ OpenVX

Operating Systems

- ✓ Linux

Test Environment

- ✓ OpenVX conformance test suite in Linux environment

Business Benefits



Accelerated vision library based on client's hardware compute capabilities



Uplifted client's DSP core with OpenVX 1.x conformant infrastructure support