

MDK PRODUCT BRIEF

Movidius provides the ultimate in low-power vision processing solutions, comprised of the Myriad 2 family of vision processing units (VPUs) plus a comprehensive software development suite we call the Myriad Development Kit (MDK).

The MDK brings together world-class development tools and software frameworks for programming the Myriad 2 VPUs. Also included are a number of Computer Vision, Image Signal Processing and other libraries to enable the best performance while programming at the C/C++ level, as well as driver sources to enable hardware integration. An out-of-the-box camera API gives Myriad 2 developers a world-class camera pipeline.

Fully integrated within a graphical environment, and well-documented with user guides and examples, the MDK enables fast iteration from prototyping through to commercial code production.

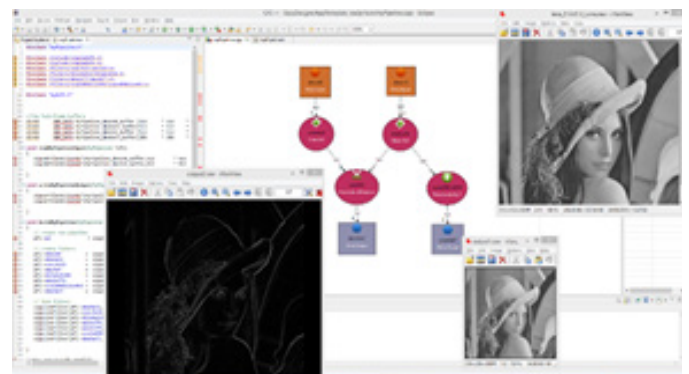
A NEW APPROACH TO RAPID PROTOTYPING

Movidius has created a programming approach to allow developers to take advantage of all Myriad 2's architectural features while removing some of the complexities of manually-scheduling code execution. With the MDK, what was once painful to make changes in an algorithm's code and fit it back into an overall application with hand-adjusted DMA descriptors now takes much less time as the application's kernel functions fit within a directed graph framework that is automatically scheduled, removing complexity from the developer's tasks and bringing it into the on-chip runtime scheduling mechanism.

The programming framework gives developers the freedom to mix together in their applications both proprietary algorithms incorporating low-level source libraries provided in the MDK, as well as the hardware accelerators flexibly set with parameters. This reduces the time and effort needed to make changes to kernel functions in an application.

MDK TOOLS

- Integrated toolchain for SHAVE processors and RISC CPUs
- Vector optimizing compiler for SHAVE processors supports C/C++ with extensive intrinsic support
- Assembler and Assembly optimizer
- GCC toolchain for RISC CPUs
- Standard ELF/DWARF Linker
- Myriad 2 Full Chip Simulator, bit-accurate and cycle-accurate
- Myriad 2 debugger supporting SHAVE and CPU cores, with TCL command line
- Function Trace Profiler, Sampling Profiler, and System Trace Profiler
- Movidius Eclipse IDE supports full compile-profile-debug flow with application Graph Designer framework and integrated memory visualizer and image comparer



MDK CAMERA DEVELOPMENT KIT

- Unified Multi-camera Framework and component control, adaptable to different sensors
- Flexible ISP pipelines and scalable architecture
- Robust auto-functions – exposure, white balance, and focus
- Camera calibration and sensor tuning tools

MDK LIBRARIES

- **Over 300 Computer Vision Library kernels such as:**

- Bitwise logical functions
- Boxfilters of various sizes
- Convolutions, convSeparable of different sizes
- AbsoluteDiff, Canny, AccumulateSquare/Weighted, and other functions
- CensusMatching
- CornerMinEigenVal
- Color conversions
- Dilate and Erodes of different sizes
- Gauss, Laplacian/sLaplacian
- HarrisResponse
- Histogram
- IntegrallImage

- Maximum, maxPool, minKernel, minMax
- medianFilter of various sizes
- OpticalFlow PyrLK
- sumOfAbsDiff, sumOfSquaredDiff
- threshold filters
- whiteBalance functions
- **Linear Algebra Library**
 - SGEMM matrix multiply
 - Other BLIS functions
- **ISP Library**
 - Mono & Bayer pipelines
 - Lanczos & Bilinear scaling
 - Warp, Purple Flare, Grey-desaturate, Mono-imbalance, Local Tone Map and many more hardware and software kernels

Myriad Development Kit Components

Myriad 2 Machine Intelligence Applications

Camera Development Kit (CDK)

Imaging, Machine Vision Solutions

Custom Camera Frameworks

Simulators

Unified Software Frameworks
Sensor & Workflow Management

Movidius Partner Applications

Calibration & Tuning Tools

Development Frameworks

SIPP
Directed Graph API

OPEN CL

Libraries

Linear Algebra

CV

ISP

Board Support Package (Driver sources)

MoviTools

Eclipse IDE

C/C++, LLVM Compiler

Multi-core Debugger

Assembler

Simulator

Profiler

MYRIAD 2 MA2x5x Development Hardware