

TI OpenVX™ (TIOVX): Standard specifications and extensions

OpenVX™ 1.1 specification

- Graph-based framework ideal for the TI heterogeneous architecture
- OpenVX standard set of data objects
- OpenVX standardized set of low-level vision kernels (43 v1.1 kernels):

Absolute difference

Image pyramid (Gaussian and Laplacian)

Reconstruction from Laplacian pyramid

Remap

Histogram

Accumulate (generate & equalize)

Filters (box, custom, Gaussian, median, Sobel)

Bitwise (And,Or,Xor,Not)

Channel combine & extract

Convert (bit depth, color, table lookup)

Stats (mean, std. dev, min/max locations)

Dilate, erode (3x3)

Non-linear filter (dilate/erode MxN)

Integral image

Optical flow pyramid (LK)

Scale image

Thresholding

Image arithmetics(+,-,*)

Corners (FAST9, Harris)

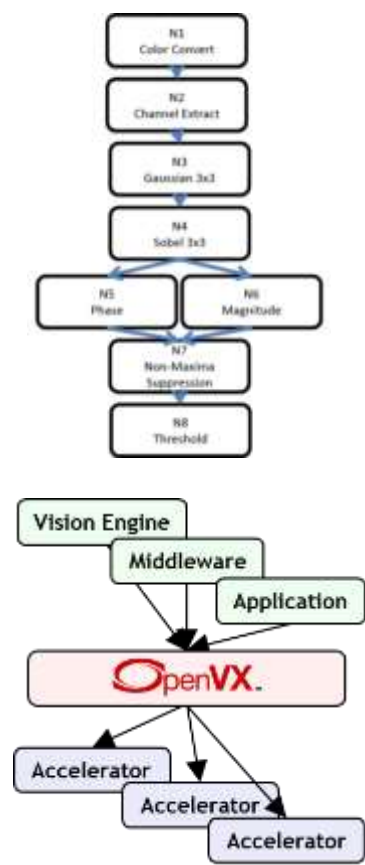
Edges (Canny)

Phase, magnitude

Warp (affine, perspective)

OpenVX™ current adopters

- Current adopters
 - OpenVX has been enabled across automotive, industrial, and consumer markets



OpenVX™ pipelining and streaming extension

API	Remarks
Graph pipelining API	
vxGraphParameterEnqueueReadyRef	Enqueues new buffers to a graph for processing: <ul style="list-style-type: none">- Graph automatically triggers when enough input is enqueued, even though previous graph execution is active- Allows late enqueue of output buffers
vxGraphParameterDequeueDoneRef	Dequeues consumed buffers from a graph: <ul style="list-style-type: none">- Allows early dequeue of input buffers
Streaming API	
vxStartGraphStreaming	Provides framework control of graph scheduling: <ul style="list-style-type: none">- Re-triggers a new graph upon completion of source node

OpenVX™ user data object extension

API	Remarks
User Data Object API	
vxCreateUserDataObject	<ul style="list-style-type: none">Used to pass a user kernel-defined data structure or blob of memory as a parameter to a user kernel.
vxReleaseUserDataObject	<ul style="list-style-type: none">Creates/releases reference to this data object
vxQueryUserDataObject	Queries the user data object for some specific information
vxMapUserDataObject	Allows the application to get direct access to a subset of the user data object
vxUnmapUserDataObject	Unmap and commit potential changes to a user data object subset that was previously mapped
vxCopyUserDataObject	Allows the application to copy a subset from/into a user data object

For more information

- OpenVX 1.1 specification:
<https://www.khronos.org/registry/OpenVX/specs/1.1/html/index.html>
- OpenVX 1.1 pipelining and streaming extension:
https://www.khronos.org/registry/OpenVX/extensions/vx_khr_pipelining/1.1/html/vx_khr_pipelining_1_1_0.html
- OpenVX user data object extension:
https://www.khronos.org/registry/OpenVX/extensions/vx_khr_user_data_object/1.0/vx_khr_user_data_object_1_0.html
- Processor SDK RTOS: <http://www.ti.com/tool/PROCESSOR-SDK-DRA8X-TDA4X>
- For additional questions, refer to the E2E community forums:
<https://e2e.ti.com/support/processors/f/791>



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