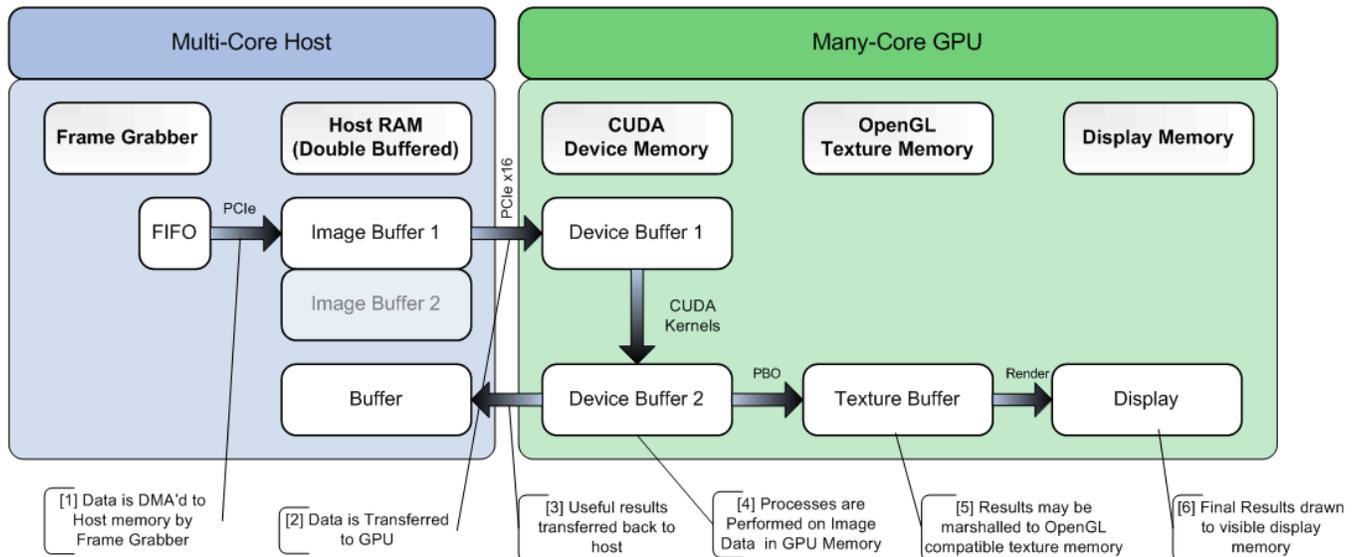


GRIPWorkx SDK

Video capture and GPGPU processing framework



GRIPWorkx is Vision4ce's video capture, processing and display software development kit. The SDK provides a framework for the development of real-time video acquisition, GPGPU processing and display software applications on Vision4ce GRIP hardware.



Real-time video processing using the GPU. Video data is streamed from a frame grabber into main memory using a DMA process and an interrupt is generated when a complete frame is available for processing. The frame is then transferred to the GPU into CUDA memory space for processing with a CUDA kernel. After processing the data can be transferred back to the host or marshalled into a compatible memory space in OpenGL texture memory. This OpenGL texture memory can then be displayed on a monitor. GRIPWorkx simplifies all of these allocation and marshalling tasks, accelerating the development process.

The main component of the GRIPWorkx SDK is the **CoreLib 'C' API**, which provides functions for image capture and display. The CoreLib API also links to the **Nvidia CUDA driver API** and provides functions for the transfer of image data to and from CUDA enabled GPU hardware for processing. The CoreLib API also provides for rapid image transfer from CUDA device memory to OpenGL display buffers for visualization.

The GRIPWorkx SDK includes source code for a number of **sample applications**. The AcqProcDemo sample application shows how to integrate the CoreLib API with CUDA runtime kernels for development of GPU processing algorithms.

Example API Functions

Image Capture

```
V4_CapCreateSource  
V4_CapContinuous  
V4_CapSingle
```

Image Transfer

```
V4_DispCreate  
V4_XferCapToGPU  
V4_XferHostToGPU  
V4_XferToHost
```

Image Display

```
V4_DispRefresh  
V4_DispUpdate
```

High Precision Timing

```
V4_TimerCreate  
V4_TimerStart  
V4_TimerRead
```

Sample Application Screenshot



CoreLib Image Sources

The Vision4ce GRIP hardware can encapsulate different types of video capture devices, each of which has a different vendor-specific API. In order to unify the capture process across all GRIP hardware configurations and protect end-users from changes to capture hardware, GRIPWorkx implements a software abstraction layer based on the concept of generic *image sources*. Image sources are loaded and controlled by the CoreLib. At run-time, image sources produce GRIPWorkx compatible images at the capture rate and notify the user application via a capture callback. Image sources themselves are libraries that wrap vendor specific APIs and are loaded under user control by the GRIPWorkx CoreLib. With GRIPWorkx the developer needs to learn only one capture API and is free to decide from application to application which platform and capture hardware is required. Vision4ce GRIP hardware supports a wide variety of acquisition hardware from different OEM vendors, but with GRIPWorkx, hardware from different vendors can be interchanged, effectively isolating the end user from future hardware changes.



Vision4ce participates in the NVIDIA developer partner program