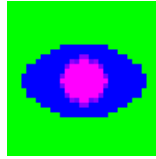


**CUDA VisionWorkbench Revision History**  
**Current through v 1.1.0.5**  
**2/22/2009**



2008 06 12	1.0.5.8	Initial Public Release
2008 06 13	1.0.5.9	Rev. Publisher to openVIDIA, test installer
2008 06 17	1.0.6.0	DLL Host function versions (CPU/C++) updated to "all worker thread"
2008 06 17	1.0.6.1	Implement cross-checks in GPU selection and extract/display GPU caps
2008 06 22	1.0.6.2	DLL var renaming as prep for auto-multi-GPU functionality
2008 06 30	1.0.6.3	Add Sobel Operator, fix GPU selection for multi-GPU systems
2008 07 01	1.0.6.4	Made Processing Bit Depth "Sticky", fixed bug in 8 bit 5x5 TileMax .cu
2008 07 05	1.0.6.5	Cleanup/Comments for CVWB Front End (C# code), added HTML help file
2008 07 10	1.0.6.6	Made Main Window location and Test pattern Width & Height Selection "Sticky"
2008 07 17	1.0.6.7	Revised PBEvents () usage in CVWB front end (C# Code), added new fields to Data file, added Min & Max buttons to Cycle group, made cycle count "Sticky", updated Utilities.cpp
2008 07 23	1.0.6.8	Added GPU memory info to Data file and GUI, fixed CudaGetDevProps () and ReportTimings () functions
2008 07 24	1.0.6.9	Minor cleanup and optimization in ConvoNNNN, CorrNNNN, TileMaxNN and SobelNN CUDA functions. Added gradient and threshold options to SobelNN functions.
2008 07 29	1.0.7.0	Added 8 bit and 16 bit, CUDA/GPU and multithreaded host CPU/C++ functions for 3x3 and 5x5 TileMin, 3x3 Tile Max, 3x3 Convo and 3x3, 5x5 and 7x7 Median. Revised Series operator. More minor cleanup and optimization in ConvoNNNN, CorrNNNN, TileMaxNN and SobelNN functions in .cu files in DLL. Integrated processing operator button handlers in CVWB front end code and improved error handling therein. Minor cleanup to VWBImage class processing functions. Rearranged main GUI to make room for additional operators and for easier usage. Made threshold choices "sticky".
2008 07 30	1.0.7.1	Cosmetic GUI changes and updated behavior of the multiplication scalar text entry box in the <i>Math Constants</i> menu
2008 08 11	1.0.7.2	Changed recommended driver to 177.79 Beta. Adjusted compiler options for release .cu files. Implemented wrappers for utility CudaVisDLL functions used externally and internally (alleviate import/export warnings for dual-use functions). Combined 8 and 16 bit multithreaded Host C++ processing function versions into integrated functions. Updated GPU histograms Histo8.cu and Histo16.cu and GUI options to allow use of GMEM atomics if GPU is arch 1.1 or later and SMEM atomics if GPU is arch 1.2 or later. Minor improvements to front end File menu handling. Fixed bug in AutoScroll functionality after Histogram operation. Revised GetComputeMode function to state variable. Additions to trace logging in CudaInit functions. Revised all Host / multithreaded C++ Median functions and CUDA 3x3 Median functions to use faster insertion-sort method instead of binary-search method. Modified 7x7 8-bit CUDA Median function to use fewer registers for compatibility with older GPUs. Updated <i>usertype.dat</i> file in package for CUDA 2.0 syntax highlighting in VS 2005.
2008 08 14	1.0.7.3	Revised CUDA 3x3 Median functions to use SMEM for temp sorting arrays (speedup). Updated Timings Panel headings for clarity/accuracy. Moved GPU buffer pitch computation before initialization and after allocation, instead of after both. Added 5 <sup>th</sup> image buffer to GPU buffer management to better support series operations. Updated OpSeriesGPU wrapper functions for clarity about GPU and host buffer management technique.
2008 08 23	1.0.7.4	Updated Recommended Driver, CUDA Toolkit 2.0 and CUDA SDK 2.0. Several front-end GUI revisions to reduce main form window to fit in display with res. < 1280 x 900. Histogram results moved to optionally-enabled results dialog.
2008 08 28	1.0.7.5	More front-end GUI revisions to reduce main form window to fit in display with res. < 1024 x 768 with screen res at standard 96 DPI. Fixed bug introduced in 1.0.7.4 with bit depth initialization and correlation kernel initialization.
2008 08 29	1.0.7.6	More front-end GUI tweaks to fit all of the text strings in controls.
2008 08 30	1.0.7.7	Integrated thumbnail and reticle functions. Added live reticles to scroll mode.
2008 09 12	1.0.7.8	Reorganized Solution and Project Dependencies, moved detailed custom build rules for all .cu files to "cuda.rules" file, created x64 Platform solution for Windows Vista 64 bit, updated file and directory management for data, error and trace logging files.
2008 09 13	1.0.7.9	Incremental GUI improvements

2008 09 15	1.0.8.0	Spin locking improvements for biggest CUDA functions. CUDA 7x7 median with reduced register utilization. Split out CUDA specific header (CudaGeneral.h). Revised image file import... now operates with .jpg files, in addition to 24 bit RGB and 8 bit monochrome .bmp files.
2008 09 18	1.0.8.1	More Spin Lock Optimization for CUDA functions plus switch for 7x7 median based upon GPU model.
2008 09 21	1.0.8.2	Moved DLLImports to separate static class. Improved thumbnail update code. Simplified Solution/Project structure and dependencies
2008 09 28	1.0.8.3	Consolidated exported DLL wrapper functions for Cuda functions with iRadius parameters and overloaded them by image data type, and reduced DLL exports/imports interfaces in the DLL and the GUI accordingly. Minor optimizations in CUDA Sobel functions. Made user-selected gain and offset constants used for scalar subtraction and multiplication "sticky" in the GUI from session to session. Added Rotate Corr function.
2008 10 20	1.0.8.4	Integrated ResetImage function and AcquireImageData function in VWBImage.cs. Added 8 and 16 bit raw image file import support throughout front end. CudaVisDLL rebuilt with new rules file
2008 10 22	1.0.8.5	Added image autoscaling option (checkbox option in main window)
2008 10 24	1.0.8.6	Added raw image export options. Integrated file load and radio button functions. Extensive GUI rework to make room for and rationalize new and old caps.
20081121	1.0.8.7	Cleaned up GPU Histogram functions. Simplified and optimized streaming GPU functions with no fundamental req. for SMEM (i.e. limited memory reuse within blocks in the kernel) (ConstMult, ConstSub, CopyImage, ImageAvg, Multiply2D, Subtract2D, Threshold. Updated GPU init functions for CUDA 2.1 SetDevice behavior change (reports error if you re-set a dev from the same host thread). Added session timer to GUI front end. Cross checked with CUDA 2.1 Beta toolkit and CUDA 2.1 beta drivers
20081123	1.0.8.8	Re-optimized CUDA based median functions (8 and 16 bit, 3x3, 5x5 and 7x7 for large perf gains vs previous versions (~2x).
20081129	1.0.8.9	Fixed handler for change in AutoRange checkbox option and made state sticky across sessions. Minor optimizations and cleanup in all CUDA filter functions. Increased max reg count to 42 for all CUDA files except the Histo functions (Note: 42 x 192 < 8192). Adjusted SmartSleep parameters for better stability for smaller kernels, at some cost to CPU utilization. Implemented .pgm file import and export filter and rearranged GUI treatment for export and import of the different file types (bmp,jpg,img,pgm). Fixed issues for handling images with a pixel width not a multiple of 4.
20081202	1.0.9.0	Reorganized AcquireImageData and BitmapFromImageData functions in VWBImage.cs into derived subclass approach, and made other associated changes. Fixed bug in histogram capabilities menu and variable initialization code.
20081208	1.0.9.1	Fixed bug from 1.0.9.0 in image auto-range and auto-offset code. Fixed "yFulcrum" bug in cuda Median functions from 1.0.8.8. Fixed bug from 1.0.9.0 in destination buffer flipping code in 8 and 16 bit GPU ternary functions (Multiply2D, Subtract2D, ImageAvg). Fixed bug from 1.0.8.9 in 16 bit GPU "subt buffer" initialization.
20081210	1.0.9.2	Added Histo refresh code when Histo is displayed and an operation affects the displayed Main image (input or output). Restored bounce-back code when cancelling out of image file open dialog when test pattern image remains resident.
20081212	1.0.9.3	Restored bounce-back code when cancelling out of image file open dialog when test pattern image remains resident. Minor optimization for GPU Convo and Corr functions (moving async kernel/tile copy to GPU ahead in function to obtain slight parallelism in CPU code between copy and core compute)
20081216	1.0.9.4	Implemented 16 bit PGM import filter capability. Cleaned up auto scale code for new input images.
20081229	1.0.9.5	Revised Input and Output thumbnail routines to use new BufferedGraphics class and also show pixel values in a raw manner to more closely illustrate underlying data.
20090102	1.0.9.6	Updated Thumbnail GUI routines for greater clarity and precision for inspecting pixel values and also to be able to offset small cursor detail region (double click on thumbnail view) and reset (using right-click menu on thumbnail views or main view). Fixed timing display bug that occurred when histogram was being displayed and another processing operation was then performed.
20090104	1.0.9.7	Introduced feature for switching Thumbnail magnification between 4:1 and 8:1. Restructured help file to separate revision history and programming guide from operating/ installation guide and also integrate instructions for 32 bit and 64 bit versions. Eliminated RetVal Label and updated GUI.
20090105	1.0.9.8	Fixed small bug in thumbnail update routine that intermittently affected output thumbnail image.
20090112	1.0.9.9	Fixed thumbnail scaling issues to operate with Windows display settings DPI set to 120 or 96. Fixed default main windows startup location (screen center). Fixed startup condition of thumbnail mag radio button (Low mag)

20090129	1.1.0.0	Added "Topmost Form" functionality with checkbox. Added full filename ellipsis and hover/tooltip at file name label. Remedied issue with startup state of main form window when the program has been closed from the minimized state. Remedied issue with image height/width labels not updating when new test pattern dimensions were selected. Moved thumbnail text box detail to Graphics object and TextRenderer methods. Added reticles and rectangles in thumb text boxes corresponding to detailed small cursor region in thumbnail views. Minor GUI cleanup in/around image dimension labels. Updated "SmartSleep" timer to Waitable Timer basis instead of Sleep basis.
20090203	1.1.0.1	Additional revisions, corrections and improvements to SmartSleep functionality in CudaVisDLL. Fixed bug with application hang on use of help menu items. Fixed bugs in GPU median functions
20090207	1.1.0.2	Removed obsolete GPU histogram functions and GUI support for arch 1.0 and 1.1 histograms. Fixed bug in automatic conversion of Img file data when switching from 8 bit processing to 16 bit processing (little-endian for Img, big-endian for Pgm)
20090208	1.1.0.3	Further optimization of SmartSleep functionality (eliminated redundant cudaThreadSynchronize calls. Cleaned up the rotating correlation function GUI behavior somewhat also (still not graphics optimized, but it's mainly there to illustrate an intriguing response of the correlation function with some images.
20090214	1.1.0.4	Multiple-instance enhancements: Made WaitableHandle timer name in SmartSleep function globally unique, added ThreadID tags to Trace, Data and Error log files so the calling instance is clear.
20090222	1.1.0.5	Refactoring/Cleanup in VWBImage, VWBUtil and VWBMainForm classes. Renamed ImageLoader.cs to VWBImageManager.cs. Extensive file/class renaming/refactoring in managed code. Restructured multithreaded thumb update functions. New class ThumbData.

### Known Issues at version 1.1.0.5

- 1) 256 bin GPU Histogram functions will have give some error in bin counts for images whose width is not an even multiple of 2 for 16 bit images or whose width is not an even multiple of 4 for 8 bit images. The total of all bins will be correct in each of these cases, but bin 195 will be overcounted by as much as (Image Height x GPU2dMemoryPitch % 2) for 16 bit images and (Image Height x GPU2dMemoryPitch % 4) for 8 bit images. Other bins will be closer to correct, but slightly low in count.
- 2) In Windows Vista with Aero effects enabled, the helper non-modal dialog boxes for the histogram, correlation tile configuration and convolution kernel configuration don't dynamically doc quite right against each other or against the main CVWB form. This is related to issues with a new API (WDM) that are unique to Windows Vista and will be fixed in a future revision.