

Matrox Imaging Library (MIL)

Version 10 highlights



New operating system support



» Windows® 8(.1)

» Ubuntu 12.04 LTS

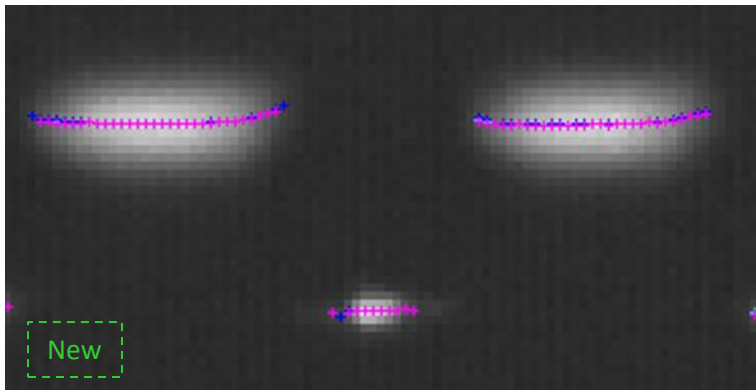
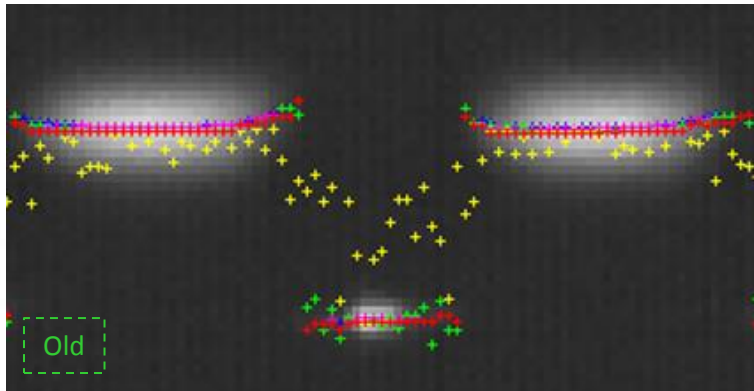
» RHEL / CentOS 6.4



» RTX64 2014*
(RTOS add-on to Windows)

*With MIL 10 Update 12.

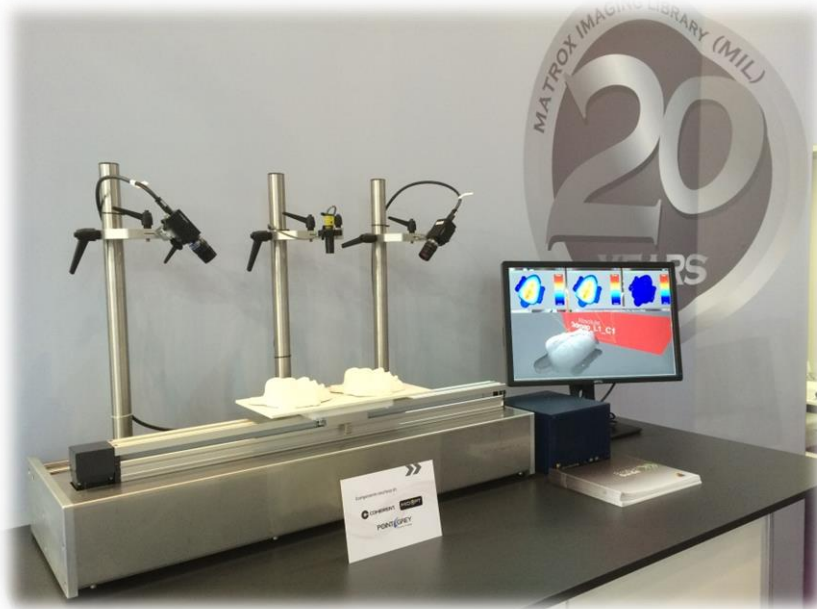
New peak detector for 3D profiling*



- » Less sensitive to parameter settings
- » Robust to beam thickness variations
- » Improved sub-pixel accuracy

*With MIL 10 Processing Pack 1.

Unified calibration for 3D profiling*

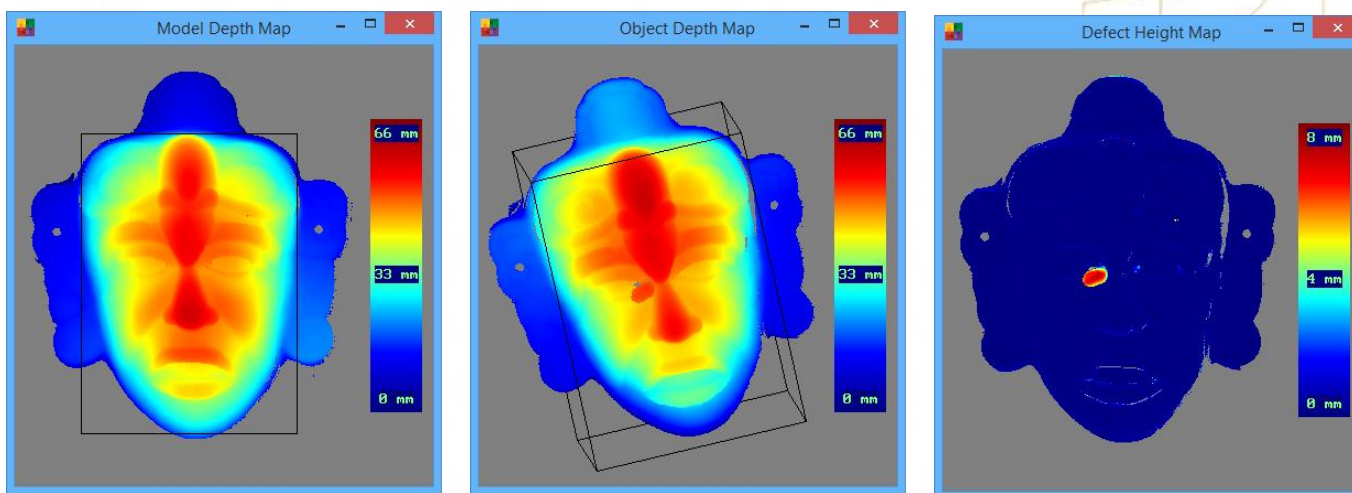


- » Calibrate multiple 3D profiling systems to work directly in same coordinate reference system
 - » Minimize occlusions
 - » Increase scan density
 - » Scan whole volume

*With MIL 10 Processing Pack 1.

New 3D alignment tool*

- » Fine alignment of model to target point cloud for pose rectification and comparative analysis

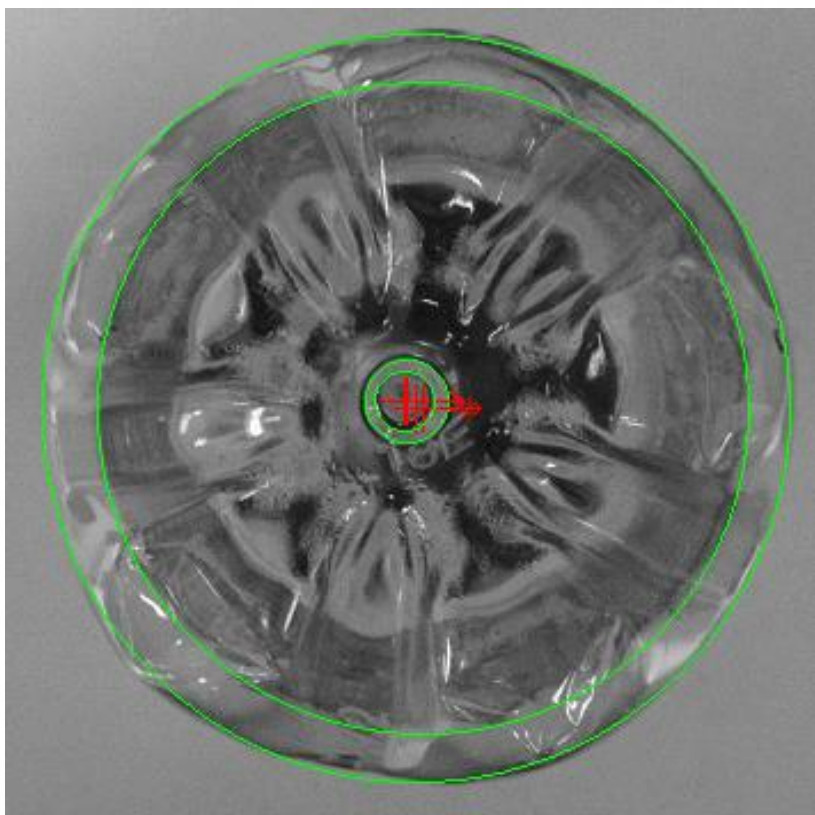


- » Model obtained from live 3D scan or file (PLY)
- » Part of 3D calibration and reconstruction package

*With MIL 10 Processing Pack 1.

Note: color-coded depth map (i.e., projected point cloud) used for visualization.

New circle finder*



- » Dedicated tool for locating circles
- » Faster, more robust and more flexible than generic techniques
- » Part of Geometric Model Finder package (new context type)

*With MIL 10 Processing Pack 1.

New color relative calibration*

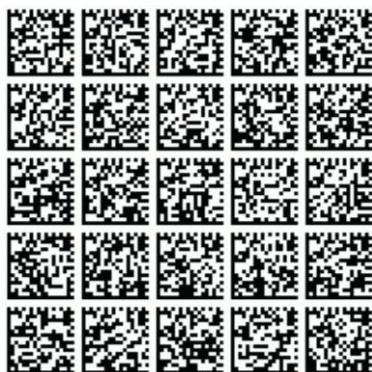
- » Correct appearance of colors due to lighting and image acquisition differences



- » Histogram, sample-to-sample and global-mean-variance methods
- » Part of Color Analysis package

*With MIL 10 Processing Pack 1.

Extended code reading/verification*

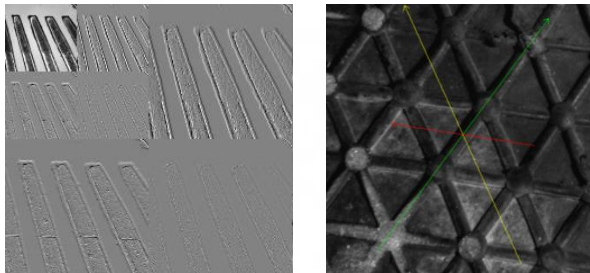


ISO/IEC 15415:2011
ISO/IEC 15426-2:2005...

- » Simultaneous decode of multiple DataMatrix codes
- » Read Aztec, Industrial 2 of 5 and EAN-8 with add-on
- » Expanded support of verification standards
 - » contrast uniformity correction
 - » extended quiet zones
 - » ...

*With MIL 10 Processing Pack 1.

Additional processing primitives*

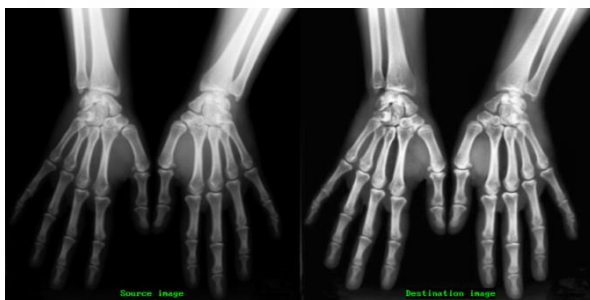
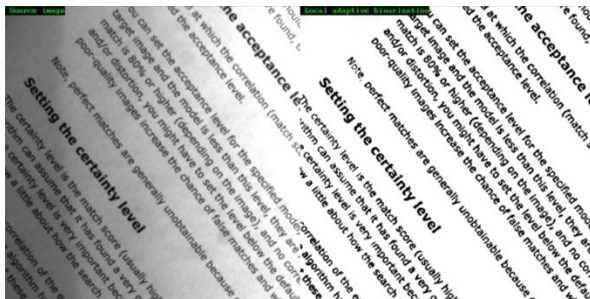


» Wavelet

» Image orientation

» Local adaptive segmentation

» Contrast-limited adaptive histogram equalization (CLAHE)



*With MIL 10 Processing Pack 1.

Fusion for extended depth-of-field*



...



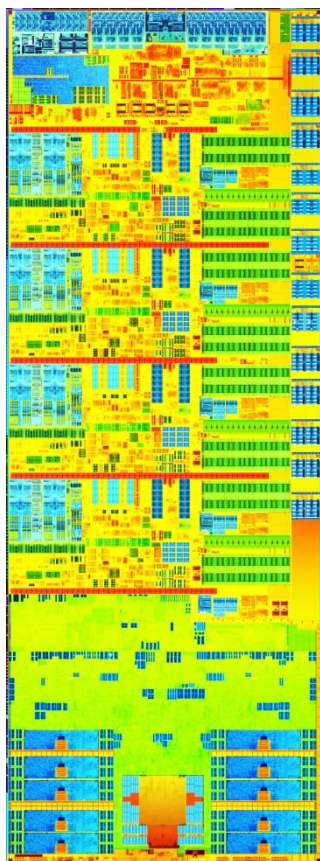
...



- » Generate a single in-focus image from a series of images at different focus points
- » Part of Registration package

*With MIL 10 Processing Pack 1.

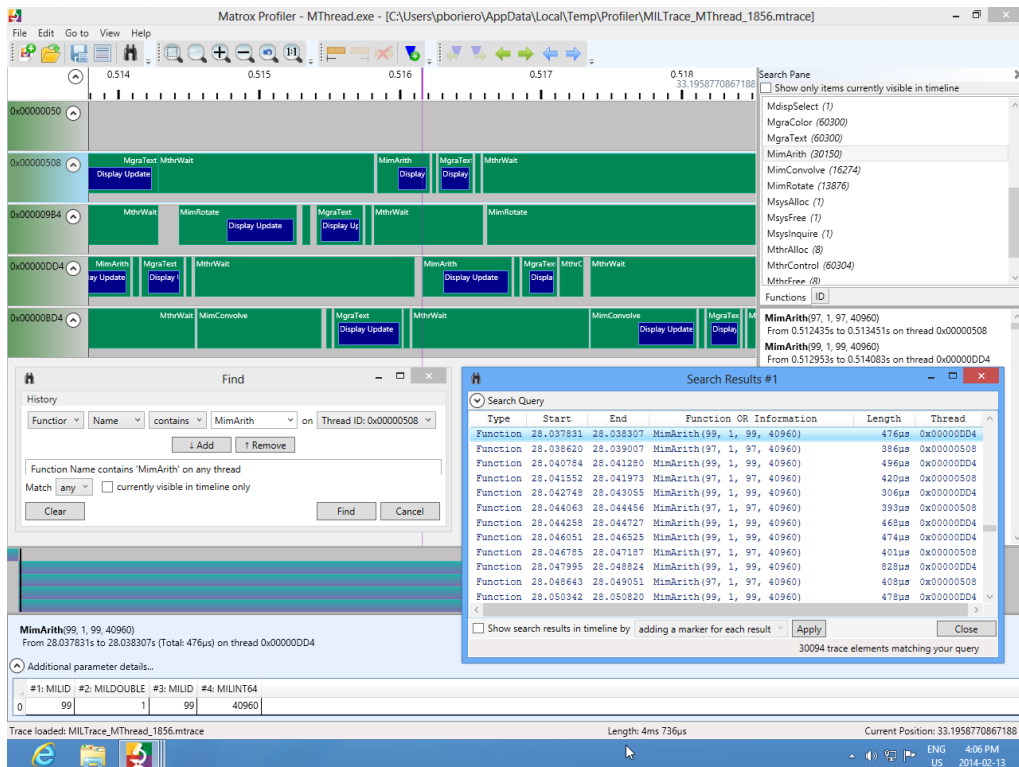
More speed optimizations*



- » Using Intel® SSE4.1 and AVX2 vector instruction sets
- » Using multi-threading across multiple cores
 - » Edge Finder
 - » Model Finder
 - » Calibration transformations

*With MIL 10 Processing Pack 1.

New Matrox Profiler utility



» For post-execution analysis of multi-threaded applications

» Helps to detect performance and synchronization issues

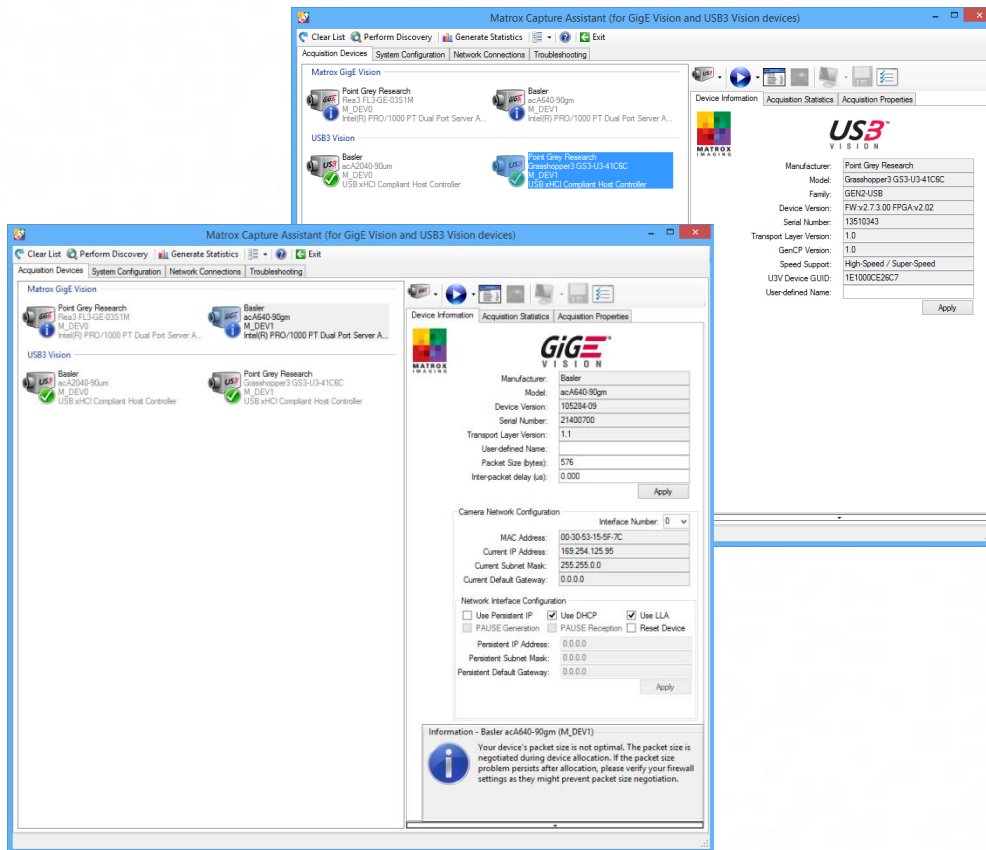
Support for USB3 Vision™*



- » Kernel-based driver for SuperSpeed USB (USB 3.0) camera interface standard

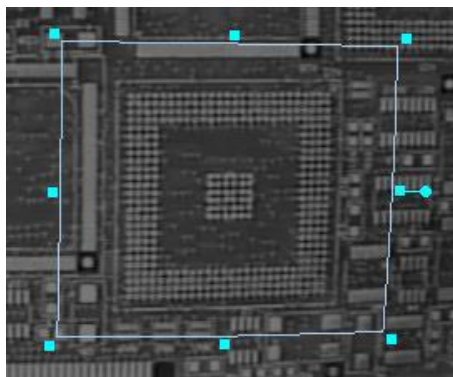
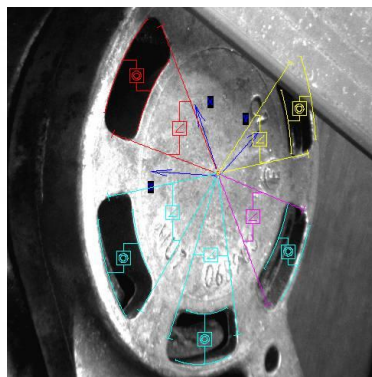
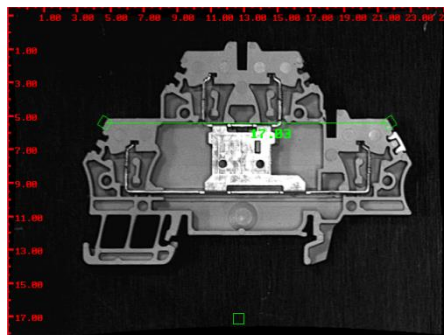
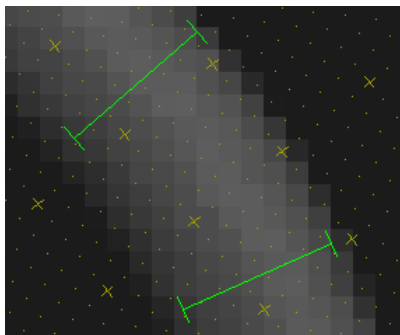
*With MIL 10 Update 19.

New Matrox Capture Assistant utility



- » For GigE Vision® and USB3 Vision
- » Diagnose setup
- » Test video capture
- » Obtain device information
- » Collect acquisition statistics
- » Access GenICam™ device properties

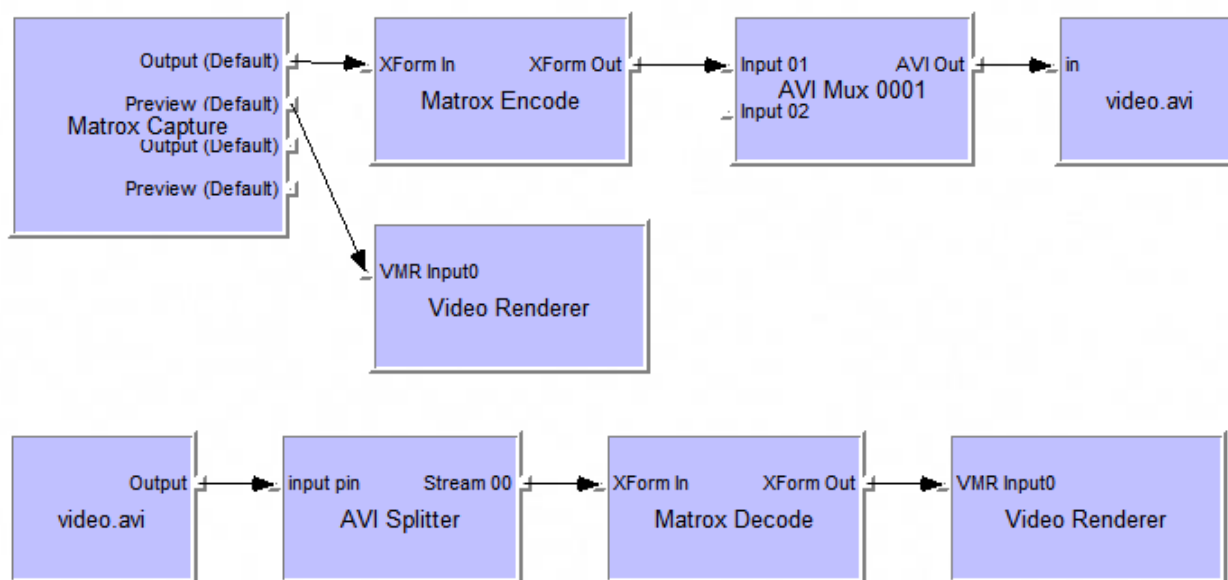
Enhanced graphical annotations



- » Sub-pixel vector graphics
- » Works in pixel and world units
- » Provides basic user and tool drawings
- » Supports interactive editing (copy, move, rotate, resize, etc.)

DirectShow® filters

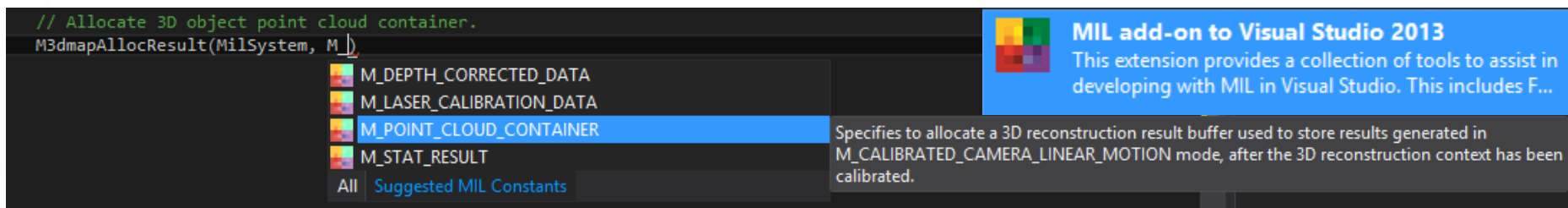
» Video capture and H.264 encode/decode*
(with or without Intel® QSV)



*With MIL 10 Update 10.

New Visual Studio® plug-in*

» Intelligent code completion and context-sensitive help



*With MIL 10 Processing Pack 1.

Interpreted MIL / MIL for JIT*

A screenshot of a Python script editor window titled "ScriptPreprocessing.py". The script is a CPython extension for MIL (Matrox Imaging Library) that demonstrates image preprocessing. It includes comments in Chinese and English, and code for structuring, binarizing, and morphological operations. The script is saved as "ScriptPreprocessing.cpp". The editor window also shows the Python logo and the text "python™".

```
#!/usr/bin/python
# -*- coding: utf-8 -*-
#
# File name: ScriptPreprocessing.cpp
# Synopsis: This example show how to use scripting to do some preprocessing.
#
# Copyright © Matrox Electronic Systems Ltd., 1992-2014.
# All Rights Reserved

import ctypes
import mil as MIL
import time

STRUCTURING_ELEMENT_SIZE_X = 1
STRUCTURING_ELEMENT_SIZE_Y = 21
THRESHOLD_VALUE = 30

def PreprocessingFunction(funcId):
    MilFunc = MIL.MIL_ID(funcId)
    SourceImage = MIL.MIL_ID(0)
    DestImage = MIL.MIL_ID(0)
    TheReturnValue = ctypes.c_void_p(1)

    MIL.MfuncParamValue(MilFunc, 1, ctypes.byref(SourceImage))
    MIL.MfuncParamValue(MilFunc, 2, ctypes.byref(DestImage))
    MIL.MfuncParamValue(MilFunc, 3, ctypes.byref(TheReturnValue))

    MilSystem = MIL.MbufInquire(SourceImage, MIL.M_OWNER_SYSTEM, None)
    MilStructElem = MIL.MbufAlloc2d(MilSystem, STRUCTURING_ELEMENT_SIZE_X, STRUCTURING_ELEMENT_SIZE_Y, 32, MIL.M_STRUCT_ELEMENT, None)
    MIL.MbufClear(MilStructElem, 0)

    MIL.MimBinarize(SourceImage, DestImage, MIL.M_FIXED + MIL.M_GREATER, THRESHOLD_VALUE, 0)
    MIL.MimMorphic(DestImage, DestImage, MilStructElem, MIL.M_OPEN, 3, MIL.M_GRAYSCALE)

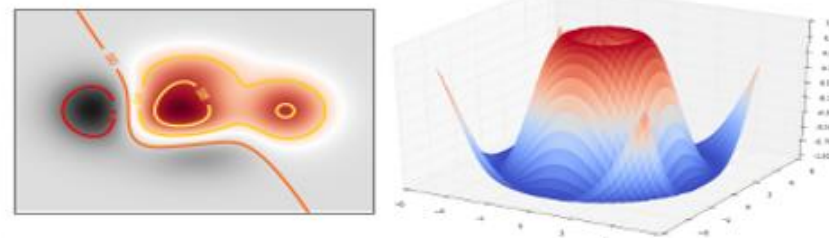
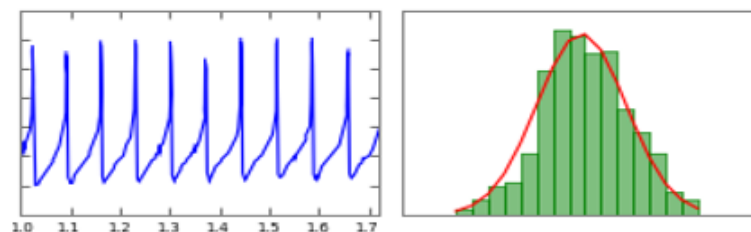
    MIL.MbufFree(MilStructElem)

    ##return the error code once everything is completed
    TheError = ctypes.c_longlong(1) #initialized as non-zero to confirm the AppGetError works.
    MIL.MappGetError(MIL.M_DEFAULT, MIL.M_GLOBAL, ctypes.byref(TheError))
    TheReturnValueAsPtr = ctypes.cast(TheReturnValue, ctypes.POINTER(ctypes.c_longlong))
    TheReturnValueAsPtr[0] = TheError

    return 0
```

» Support for C-Python™ / C# / Visual Basic® scripting and execution

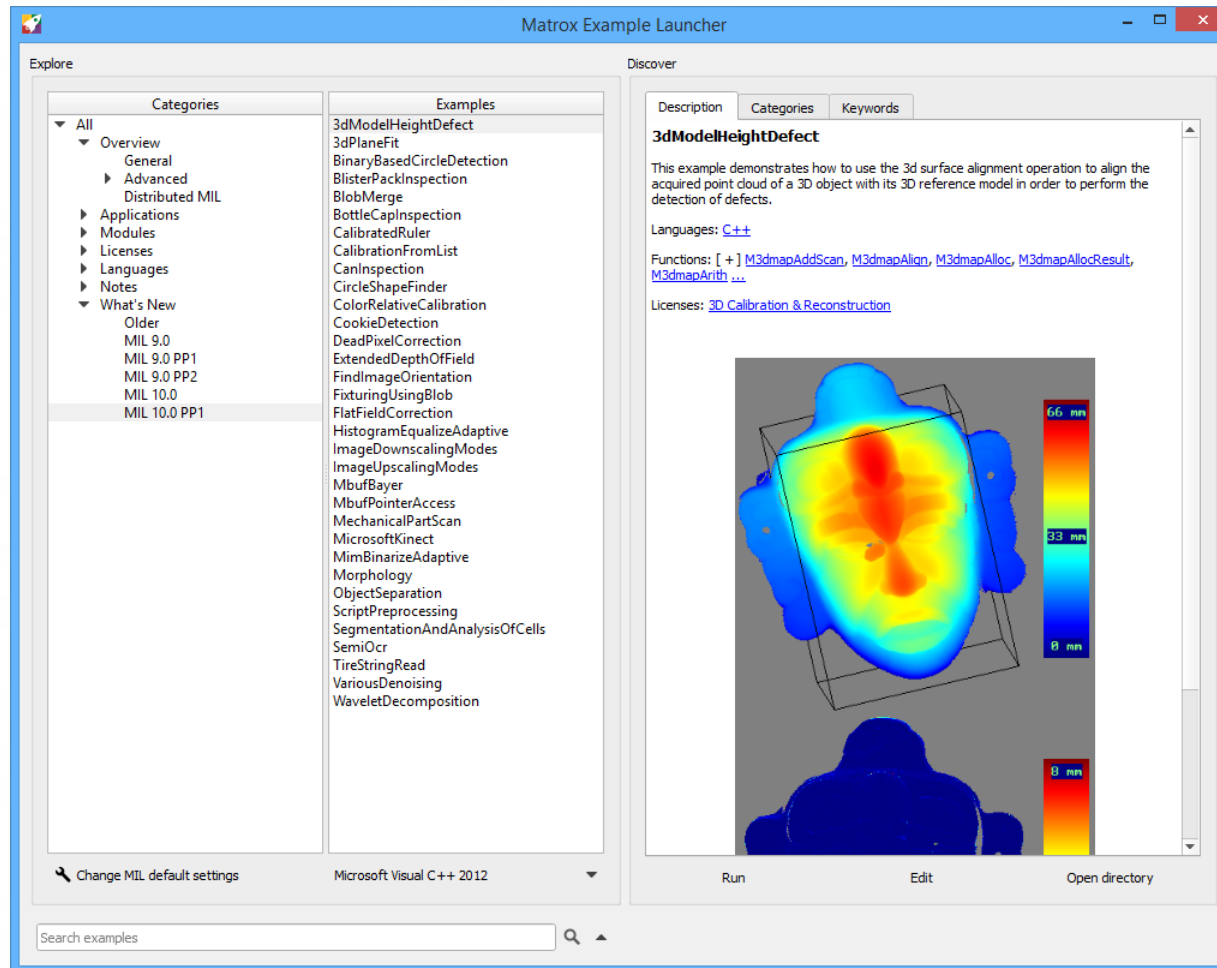
» Rich collection of third-party Python packages for plotting, etc.



*With MIL 10 Processing Pack 1.

MIL 10 highlights
February 2015

Redesigned Matrox Example Launcher*



*With MIL 10 Processing Pack 1.

MIL 10 highlights
February 2015

Operating systems support

- » Windows 8(.1)
- » Windows 7 with SP1
- » Windows Embedded Standard 7¹
- » Windows XP (32-bit) with SP3
- » RTX64 with SP1 (RTOS)²
- » Ubuntu 12.04.3 and 12.04.4 LTS
- » Red Hat Enterprise Linux / CentOS 6.4

1. On Matrox 4Sight GP(m) industrial . 2. With MIL 10 Update 12.

Development tools support



- » Visual Studio 2013, 2012, 2010 and 2008
- » C/C++, C# and Visual Basic

Hardware and interface support

- » GigE Vision^{1,2}
- » IEEE 1394 IIDC³
- » Matrox 4Sight GP
- » Matrox Concord
- » Matrox CronosPlus³
- » Matrox Morphis⁴
- » Matrox Morphis QxT^{3,5}
- » Matrox Orion HD^{3,6}
- » Matrox Radiant eCL²
- » Matrox Radiant eV-CXP^{2,6}
- » Matrox Radiant eV-CL/CLHS^{2,6,7}
- » Matrox RadiantPro CL^{2,7}
- » Matrox Solios eA/XA
- » Matrox Solios eCL/XCL-B
- » Matrox Solios eV-CL
- » Matrox Supersight
- » Matrox Vio
- » USB3 Vision^{3,6,8}

1. Matrox Solios GigE as generic NIC.

2. RTX64 support available/planned.

3. Windows only.

4. No support for JPEG2000 offload.

5. No support for MPEG4 encoder.

6. Windows 7 and up.

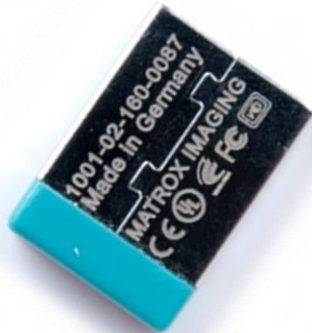
7. 64-bit only.

8. With MIL 10 Update 19.

Licensing



Development dongle



Run-time dongle

- » New development and run-time licenses
- » New USB-only compact dongles
 - » Can be used independently by application developer to license own software
- » Ability to upgrade a run-time license from MIL 9 to 10