
Matrox Imaging Library (MIL) 10.0 MIL CoPilot
Release Notes (milcopilot)
May 2018

This document outlines what is new with MIL CoPilot and explains the current limitations and particularities of this product.

It also presents last minute information that did not make it into the manual or on-line help. Note that this text file serves to complement your manual. The information found in this file overrides your formally documented material.

Main Table of Contents

Section 1: What's new in MIL 10.0 Update 59 (MIL CoPilot)

Table of Contents for Section 1

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1. Overview

MIL 10.0 Update 59 (MIL CoPilot) includes new processing functionalities and utilities, as well as general usability improvements. In particular, this new release provides:

- additional image processing primitives,
- support for the SureDotOCR module,
- support for the Code Reader module,
- support for running a list of operations on a sequence of images,
- a utility to generate a sequence of images,
- right-click support on a specific result for quickly adding a MIL "GetResult" operation,
- new examples and many more adds-on to discover!

This release also includes many bug fixes, including the resolution of intermittent crashes and interactivity flaws.

2. Installation notes:

- The minimum requirement for this update is MIL 10.0 with Processing Pack 2.

- Windowsâ€™ automatic 8.3 file name creation needs to be enabled in order for the MIL CoPilot installer to access the temp folder when the user name contains a space. This option allows Windows to create short file/folder name aliases for ones with long names for programs, such as the MIL CoPilot installer, that don't support spaces in the file/folder names. Alternatively, the MIL CoPilot installer needs to run from a user account that belongs to the administrators group and has no spaces in it. Note that the same applies for uninstalling MIL CoPilot.

- Building the generated code using Visual Studio 2015 or 2017 also requires the presence of Windows SDK version 8.1, which is installed from the Visual Studio setup.

- Note that the MIL 10.0 Update 59 setup installs the .NET runtime version 4.6.1 as well as MIL 10.0 Update 63.

3. New functionalities and improvements

This release includes many new features, as well as modifications
improving the look and feel, and the user's experience, including:

- Improvement: general usability of CoPilot has been improved.
- New: MblobReconstruct() is now supported in CoPilot.
- New: MimZoneOfInfluence() is now supported in CoPilot.
- New: MimTransform() is now supported in CoPilot.
- New: MimHistogramEqualize() is now supported in CoPilot.
- New: MimDistance() is now supported in CoPilot.
- New: MimLabel() is now supported in CoPilot.
- New: executing a list of operations on a sequence of images is now supported.
- New: a ribbon to facilitate the acquisition of a sequence of images is now available.
- New: a "GetResult" operation can now be easily inserted in the Operation List by right-clicking on a result cell in a result table.
- New: the ribbon to edit an MgenLutFunction LUT now supports the M_POWER function.
- New: opening a workspace saved using the previous version of MIL CoPilot (MIL 10.0 Update 44) will upgrade the workspace to this version (MIL 10.0 Update 59) and produce a report with the list of modifications.
- New: a copy to clipboard button is now supported in the Object Properties.
- Improvement: the central view now auto-scrolls when a rectangular area is interactively defined.
- New: a menu item to open the Start Page is now available in the Home Show/Hide Windows.
- New: the File menu now includes a link to the Start Page.
- New: a check-box now allows locking the range to the depth of the source image in the line profile utility.
- New: the preferences now includes the default display view mode option.
- New: a warning now indicates when the insertion bar is not at its default location.
- New: a contextual menu is now supported for the Object Properties.
- New: the operation code snippet now supports the copy to clipboard.
- Improvement: the utility tab is now brought on top when the associated image is selected.
- Improvement: a graphic is now selected when when the corresponding utility tab is selected.
- Improvement: in the Variable Watcher, the type of variable is now displayed according to the selected programming language.
- New: it is now possible to rename a variable in the Variable Manager.
- New: the Operation List is now split into multiple sections such as the Processing Function section.
- Improvement: the workspace now keeps track of the latest generated Visual Studio solution.
- New: the preferences now includes the default maximum number of results to report.
- New: the Recent Workspaces list now has a contextual right-click menu to, for example, remove a workspace from the list.
- New: a hint icon may now appear for items in the Operation List and in the Object Browser to indicate potential workspace optimizations.
- Improvement: in the code generation, the status icon now indicates a compilation error occurred.
- New: corresponding variables are now automatically created when MxxxInquire and MxxxGetResult operations are created.
- New: in the code generation, a warning is shown if the code has been externally modified.
- New: in the ribbons, the destination buffers can now be set to a Clone as source, or Reset as source.
- New: in the code generation, the generation of Visual Studio 2017 solutions is now supported.
- New: it is now possible to find operations related to a given variable name.
- New: it is now possible to find variables related to a given operation.
- New: links to "Matrox Vision Academy" have been added to the Start Page and to the interface's QuickAccess (at the top-right of the main window).
- New: a drop-down has been added to the interface's QuickAccess to open the MIL and MIL CoPilot helps.
- New: in Advanced mode, a button to delete all the operations has been added in the Home ribbon.
- New: the generated code header now lists the minimum MIL requirements and updates.

- New: a dialog box to manage the invalid path when opening a workspace is available.
- Improvement: interactive definition of a Pattern Matching region can now be done in World units when the target image is calibrated.
- New: a button to reset the highlighted sections in the generated code is available.
- New: in the code generation, an Open Folder button has been added.
- Improvement: in the Model Finder ribbon, the first model is now selected by default if no model has not been selected.
- New: in the status bar of the current view, a menu to modify the display View Mode is now available.
- New: in the generated code, it is now possible to disable the MIL errors.
- New: a Help (?) button is now available in most panes to get quick access to the most appropriate MIL CoPilot Help page.
- New: previews of LUTs and arrays are now available.
- New: a tool-tip now indicates the path of objects loaded from files.
- Improvement: the different Model Finder ribbons for defining models have been standardized.
- New: MIL Function ribbons support additional functions such as Mdmr and Mcode functions; MdigControl and Inquire; MimBinarizeAdaptative, MimFlatField, MimMatch, MimShift, and MimHistogramEqualizeAdaptive; MobjAlloc, Control and Inquire.
- Improvement: destination buffers are now generated using MbufClone() instead of MbufAllocColor()
- Improvement: the histogram utility has been re-factored and improved for usability.
- Improvement: the image statistics pane has been re-factored and improved for usability.
- Improvement: the Function Editor's Apply button is now disabled when a parameter is incorrect.
- Improvement: a new workspace is by default saved into the default folder "My Documents\Matrox Copilot Workspaces" to speed up the opening of files. The default folder can be changed in the MIL CoPilot Options pane.

Section 2: What's new in MIL 10.0 Update 44 (MIL CoPilot)

Table of Contents for Section 2

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1. Overview

- MIL CoPilot provides a unified interactive environment to experiment with MIL; allowing programmers to test one or more approaches for an application, before writing any code.

- MIL CoPilot is centered on the image, giving access to MIL image processing and analysis operations through a contextual ribbon menu with an interactive configuration.

- MIL CoPilot records applied operations in a list that it converts into executable code in one of the programming languages, supported by MIL.

- Particular aspects of images can be studied using an assortment of provided utilities.

2. New functionalities

2.1 Supported MIL functions

The following is a list of supported MIL functions:

- Buffer allocations and copies.

- Point-to-point and geometric transformations.
- Linear filters, rank filters, and morphology primitives.
- Calibration definition and operations.
- Pattern Matching and Model Finder tools.
- Measurement tool and Blob analysis.

2.2 Utilities

The following is a list of the utilities provided with MIL CoPilot:

- Line and arc measures and profiles .
- Image statistics and histogram.
- A compare image tool.
- Code and project generation for C++, C#, VB.net, and Python.
- Export results to a Microsoft Excel XML or CVS file.

2.3 Examples

Several workspace examples are provided with MIL CoPilot. These examples are available from MIL CoPilot start page but also from the MIL Example Launcher by selecting the MIL CoPilot platform.

3. Known limitations

The following is a list of known limitations with this product.

- Primitives based on a context, such as the dead pixel correction operation, are not yet available in MIL CoPilot.
- Running on a sequence of images or from a digitizer is not yet available in MIL CoPilot. To apply the operation on a new image, edit the source image path of the buffer's restore operation.

3.1 Unsupported constants

- The following constants are not supported:

  M_INTERACTIVE in all stream, save, import, export and restore functions.
  M_LOAD and M_MEMORY in all MxxxStream functions.
  M_ALL and M_DEFAULT in all MxxxGetResult (ResultIndex parameter)
  M_WINDOW_HANDLE in MdispInquire.
  M_DELETE in MmodDefine and MpatDefine.
  M_AUTO_DEFINE in MmodDefine.
  M_MULTIPLE in MpatDefine.
  M_INCLUDED_BLOBS in MblobGetResult.

3.2 Unsupported MIL functions

The following is a list of known limitations, by MIL module:

- Blob module:
  - MblobMerge and MblobReconstruct are not yet supported.
  - Blob post-calculation is not supported.
  - M_VECTOR_AND_RASTER regions are not supported.
- Calibration module:
  - McalGrid M_DISPLACE_..._COORD is not yet supported.
  - 3D calibration operations are not yet supported.
  - McalTransformImage with M_USE_DESTINATION_CALIBRATION is not yet supported.
- Measurement module:
  - Result statistics (M_MAX, M_MIN,...) are not yet supported.
- Model Finder module:
  - Advanced model definitions (auto-define, from edge result, from model finder result, merged model) are not yet supported.
  - Model weighted mask are not yet supported.
- Primitives:
  - The following primitives are not yet supported:
    - MimZoneOfInfluence,
    - MimWatershed,
    - MimWarp,
    - MimTransform,
    - MimPolarTransform,
    - MimLocateEvent,

- MimLabel,
- MimHistogramEqualize,
- MimFindExtreme,
- MimDistance,
- MimCountDifference,
- MimConnectMap,
- MimArithMultiple,
- McolProject,
- McolDistance,
- MbufBayer.

3.3 Utilities

The following is a list of utilities included with MIL CoPilot:

- 32-bit float buffers
  Line and Arc Profiles are not available on 32-bit buffer.

- YUV buffers
  YUV buffers are not supported by the utilities: Line and Arc profiles, Histogram, etc

4. Known issues

The following is a list of known issues with the product:

- When using the Blob module, several unavailable feret feature columns may be filled with uninitialized data. For example, enabling the binary version of a feature (specifically, M_FERET_PRINCIPAL_AXIS_ELONGATION, M_FERET_AT_PRINCIPAL_AXIS_ANGLE, M_FERET_AT_SECONDARY_AXIS_ANGLE) will result in erroneous columns filled for the equivalent grayscale feret features.

- MIL Copilot will crash if a non-image buffer is used in the "Compare Images" tool. This tool only works with image buffers.