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Mimics inPrint 3.0

Release notes – Beta

Regulatory Information

Mimics inPrint (hereafter 'Mimics') is intended for use as a software interface and image segmentation system for the transfer of imaging information from a medical scanner such as a CT scanner or a Magnetic Resonance Imaging scanner to an output file. It is also used as pre-operative software for simulating/evaluating surgical treatment options.

Mimics is not intended to be used for mammography imaging.

Usage of the software signifies your acceptance of the above. Please refer to the Instructions For Use for more information.

Disclaimer:

Mimics inPrint 3.0 Beta is provided for beta-testing purposes only and not commercially available in the USA, Canada and EU.

Copyright 2017 Materialise N.V. – Release notes 11/2017, L-10740 Revision 3
For Mimics inPrint 3.0.0.194

1 System Requirements

1.1. Minimum system requirements

Software	Hardware
Windows 7 – 64bit	Intel Core 2 Duo / AMD X2 AM2 or equivalent
Internet Explorer 6	4 GB RAM
PDF reader	DirectX 9.0c compliant graphics card with 512 MB RAM
	5 GB free hard disk space
	Resolution of 1280x1024

Note: Mac® users can install MIS using Boot Camp® in combination with a supported Windows OS.

Note: Projects created or modified in a version prior to Mimics Medical/Research 18.0 are not supported by Mimics inPrint 2.0 or subsequent versions.

1.2. Recommended system requirements

Software	Hardware
Windows 7 - 64bit	Third generation Core i5/i7 or equivalent
Internet Explorer 10	8 GB RAM
	DirectX 10.0 compliant ATI Radeon/nVidia Geforce card with 1GB RAM
	10 GB free hard disk space
	Resolution of 1680x1050 or higher

Note: Other qualifications may apply. When working with datasets larger than 1GB the system should comply with the recommended system requirements.


The following operating systems were used to test Mimics inPrint 3.0:

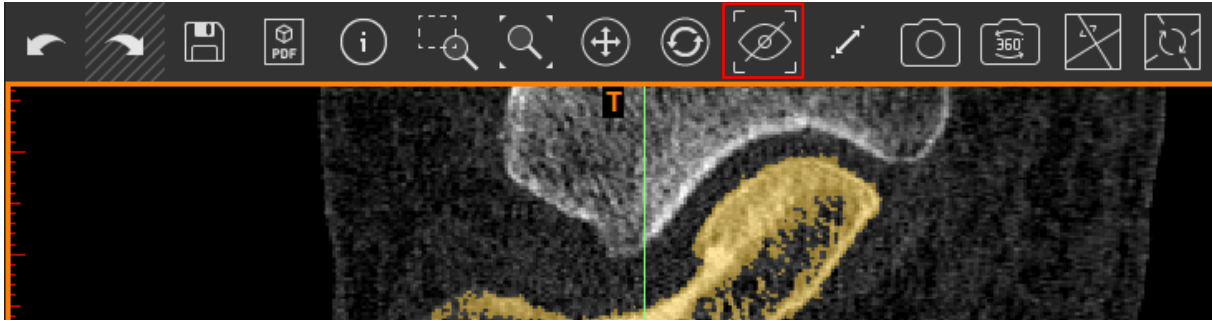
- Windows 7 Professional 64-bit
- Windows 8.1 Professional 64-bit
- Windows 10 Pro 64-bit


Mimics inPrint is software and does not degrade in performance. Its lifetime is determined by commercial requirements, obsolescence of its techniques or obsolescence caused by changes in its host environment (refer to above requirements). Support can in any case not be guaranteed beyond 7 years after the release of this particular version of the software.

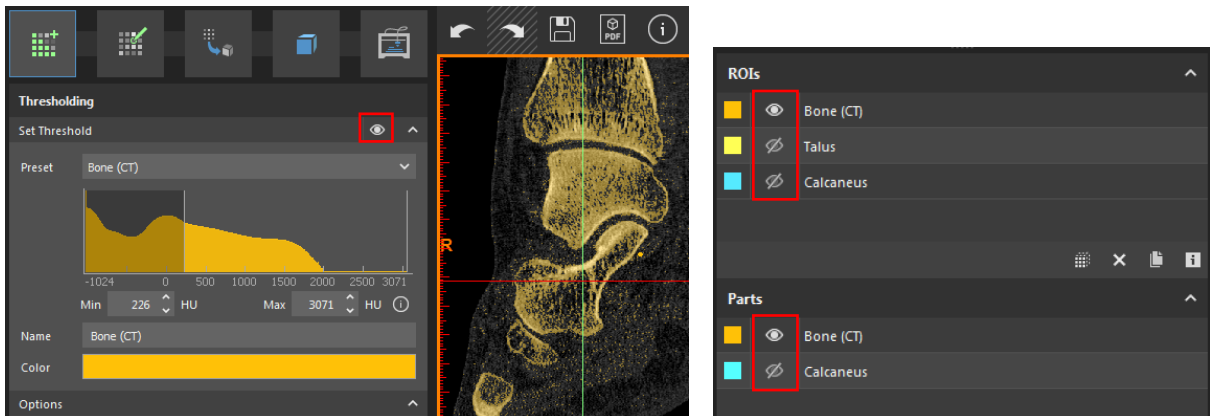
2 Visualization

2.1. Show original medical images

The visualization of a Region of Interest or a Part on top of the medical images can be hidden via the general shortcut **I** or via the Visibility icon . This icon is present on the main toolbar above the images where the user can toggle on or off the visibility of all present objects.

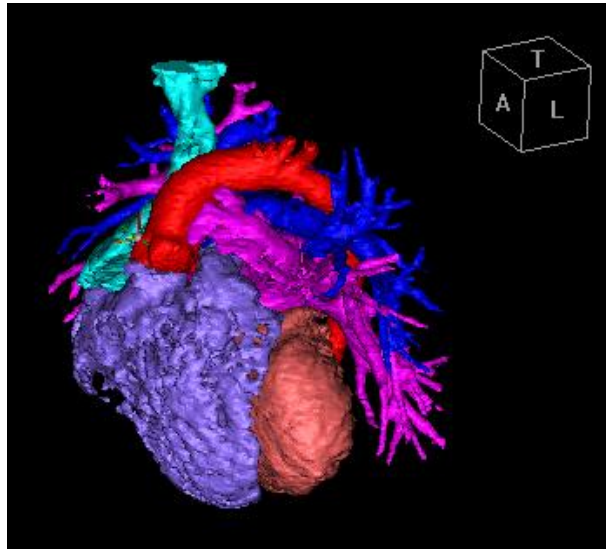


Inside a tool and via the object lists the user can toggle on or off the visibility of specific objects via the visibility icon .

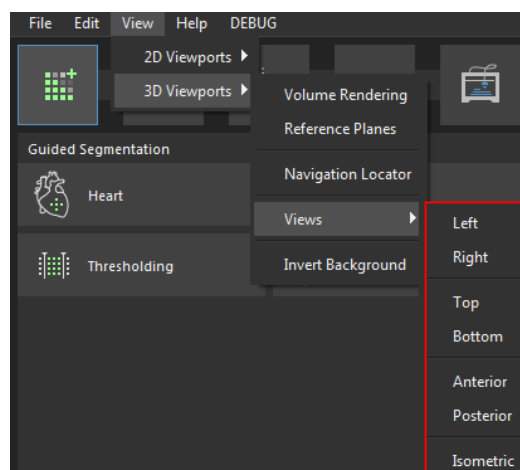


2.2. Standard 3D views


Based on the orientation of the DICOM images it is possible to show the objects in the 3D view according to a certain orientation. The orientation cube in the top right corner of the 3D view shows the orientation of the 3D view at that moment. By clicking on one of the letters, referring to the different orientations, on the side of the cube the orientation will change to that specific orientation.

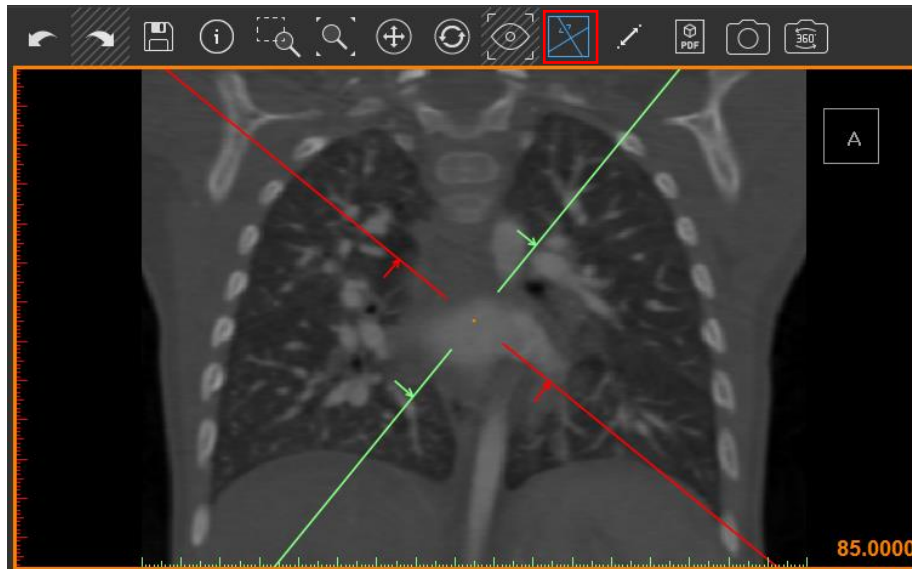


In the *View* menu the different standard 3D views are listed. The orientation can also be changed via this menu or via the shortcuts. When hovering over the 3D view it is possible to press the first letter of a certain orientation to change the orientation of the 3D view to that specific orientation. For example: press *A* for the *Anterior* view of the 3D object. With the shortcut *Tab* it is possible to switch between the different views of the list of standard 3D views.




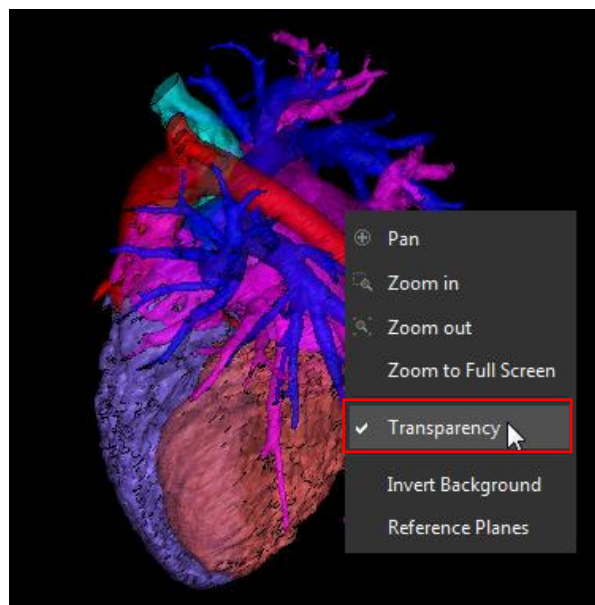
2.3. Multi Planar Reconstruction (MPR)

With the Multi Planar Reconstruction tool images can be interactively resliced to visualize certain areas of the anatomy. The MPR view can be toggled on via the icon  on the main toolbar. If it is toggled on then all views will have an orientation cube to show the current orientation of each view. By grabbing the crosshair lines, outside of the arrows, it is possible to rotate the image planes. By clicking on a location in the images or grabbing the crosshair lines, inside of the arrows, it is possible to move the center of the crosshairs.



2.4. Transparency

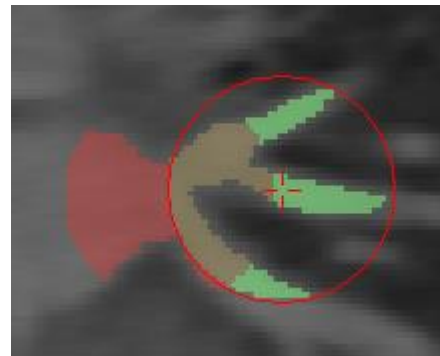
In the 3D view it is possible to make all Parts in one click transparent via right clicking and toggle on the *Transparency*. All Parts will now be shown with an opacity of 50%. Via the *Properties*  of the Part it is possible to adjust the opacity level.



3 Create Region of Interest

3.1. Vessel

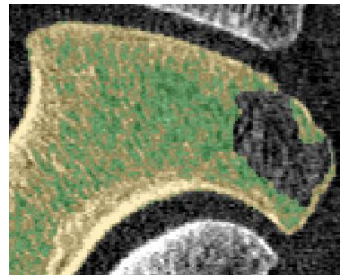
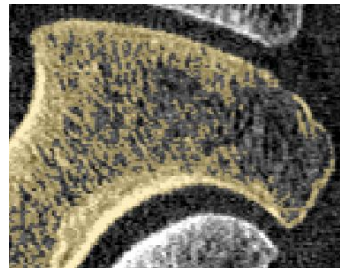
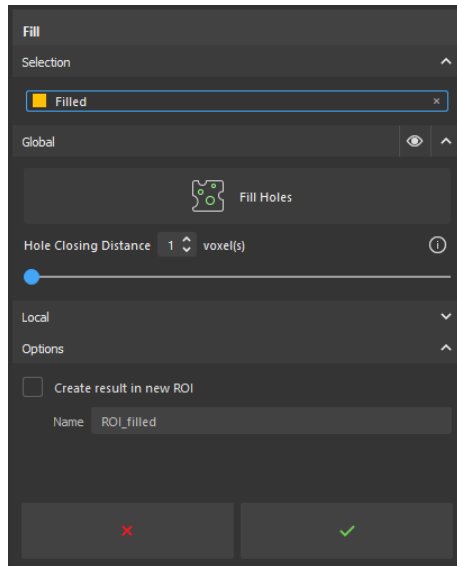
This tool allows to grow a Region of Interest based on the selected threshold, the size of the grow cursor and the connecting pixels. By clicking on the Region of Interest the threshold range of this region will be automatically detected. By holding and dragging the mouse the colored pixels will grow and will be visualized in the 2D images and the 3D view.



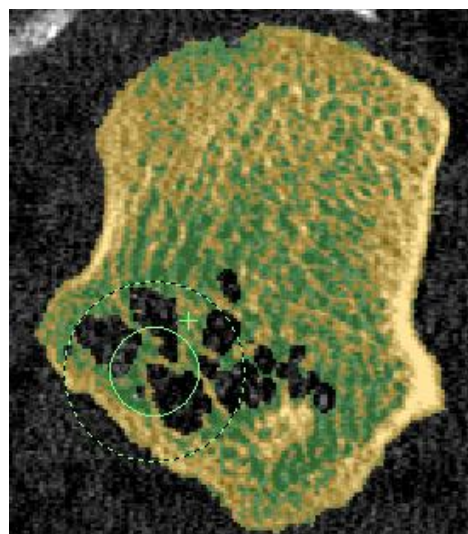
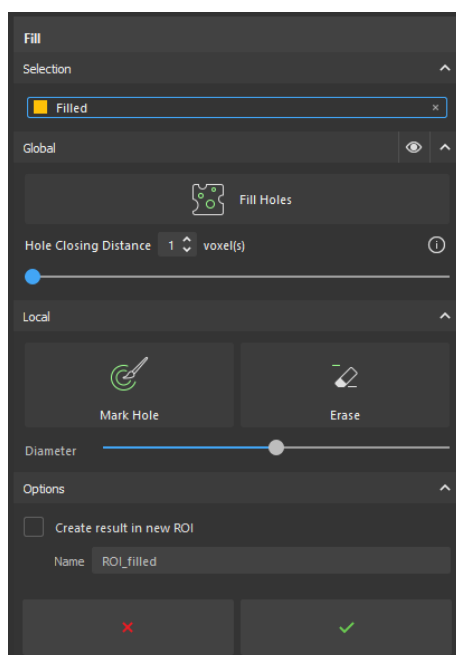
4 Edit Region of Interest

4.1. Fill Region of interest

With the *Fill* tool a Region of Interest can be filled up to create a full ROI. First a *Global* fill holes can be used to fill the input taking into account a certain size of *Hole Closing Distance*. The result will be shown with a green preview so that it can be verified against the input and the medical images.



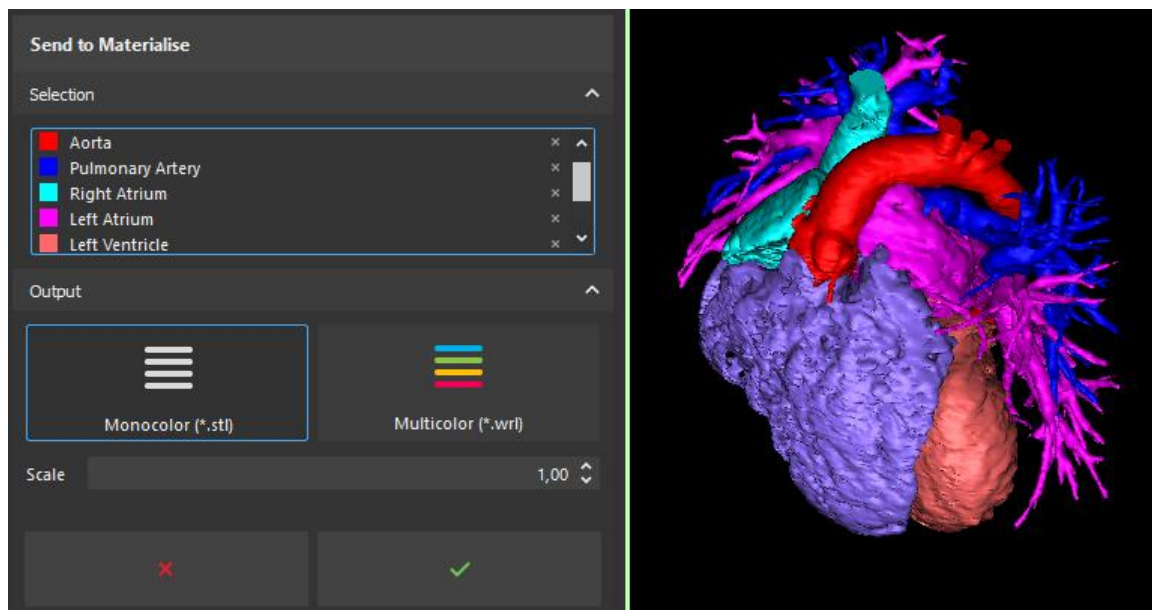
With the *Local Mark Hole* the user can fill locally in the 2D views holes that require more input. The cursor of the *Local Mark Hole* consists out of two circles, the inner circle will add pixels to the input ROI and the outer circle will close and fill holes based on the size of the circle. With the *Erase* functionality too much pixels can be removed slice by slice.



5 Prepare for Print

5.1. Send to AnatomyPrint

With this tool it is possible to directly send the created parts from Mimics inPrint to the Materialise AnatomyPrint service to get them 3D printed.

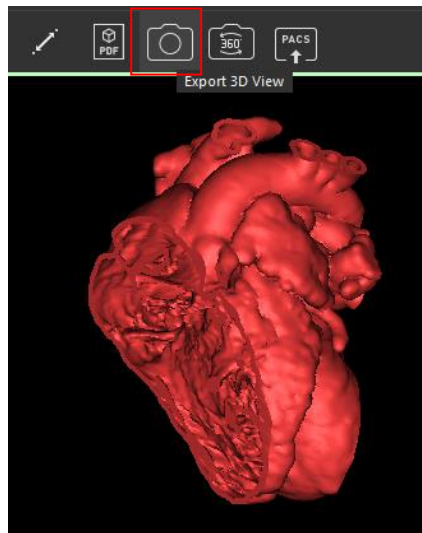


6 DICOM screenshot

6.1. Export 3D view

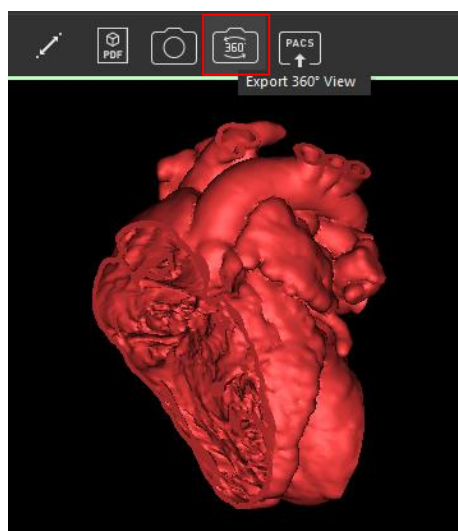
Via *Export 3D View* a screenshot can be taken of the current 3D view with the visible object(s). This screenshot will be saved as a DICOM file that contains the DICOM tags of the input images and will be stored in a folder next to the project. The file will contain the DICOM tags of the input images and can be read by any standard DICOM viewer.

During a workflow the user can take a screenshot whenever he wants so that different steps of his workflow can be visualized.



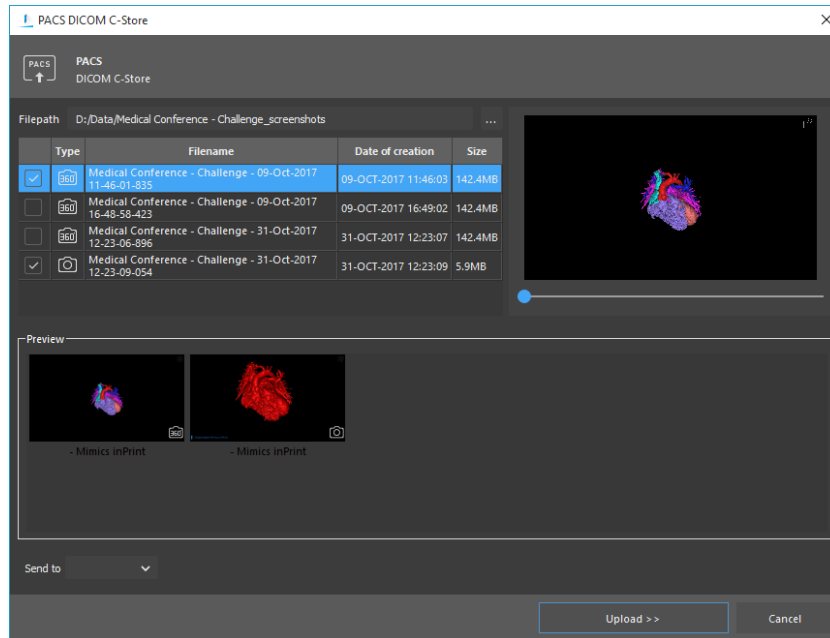
6.2. Export 360° view

With this functionality a set of screenshots can be taken that will represent the rotation of the visible object(s) in the 3D view. The visible object(s) will be rotated around the vertical axis of the 3D view and every 15° a screenshot is taken. This will result in a DICOM file that can be reviewed in a DICOM viewer where it will be possible to scroll through the images to see a 360° view of the objects.

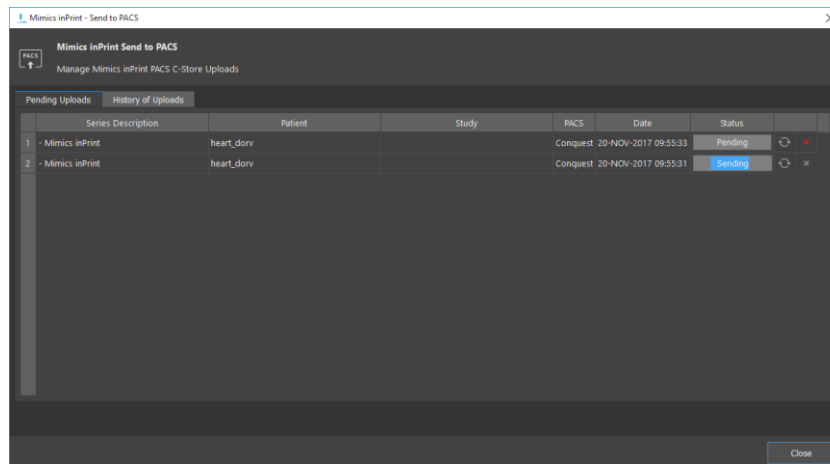


7 Send to PACS

Next to retrieving data from PACS it is now possible to send created DICOM files of your result to PACS with the *Send to PACS* feature. Select the DICOMs that need to be sent to PACS and select to which PACS.



The Pending Uploads and History of Uploads can be reviewed in the uploader.



8 General

8.1. Usability improvements

To ensure a fluent workflow the visualization behavior and selection behavior of objects as input for a tool has been updated. A clear difference is made between visualizing and selecting an object. The workflow of multiple objects is improved by updating the behavior of input selection when working with a tool.

8.2. Compatibility with Mimics Innovation Suite

Mimics inPrint is now compatible with our Mimics Innovation Suite software, Mimics and 3-matic. It is possible to open a Mimics inPrint project in Mimics and work further with more advanced tools. Also it is possible to copy and paste Parts between Mimics inPrint and the Mimics Innovation Suite software, Mimics and 3-matic, to continue easily with the workflow.

8.3. Auto save

During a workflow Mimics inPrint will regularly auto save the project so that the latest version of the project is available. To interrupt a workflow as less as possible an auto save will only occur when there is no calculation in progress so that this calculation can be first finished well.

9 Known issues

- Translate & Rotate
In the tools *Translate* and *Rotate* one-click navigation by pressing Shift + *LMB* doesn't work.
- Translate & Rotate
Selection becomes empty when clicking in the viewports away from the controls.
- 3D interpolate
The *Diameter* control in the User Interface doesn't update when changing the diameter of the brush with the shortcut *Ctrl + LMB*.
- Split & Fill
After using *Pan* in the 3D view via *Shift + RMB* a forbidden cursor is shown. A workaround for this issue is to press *ESC* which will bring back the edit cursor of the tool.
- Edit ROI tools
When opening a tool from this step and using *Pan* or *Zoom in* from the context menu, click *RMB* in viewports, the tool will close.
- MPR
Context menu, click *RMB* in 2D viewports, doesn't when clicking in the area inside the arrows.
- Send to PACS
The separate *Upload* of PACS doesn't launch automatically to upload pending uploads after restarting the computer.
- Configure PACS
The checkboxes *Q&R* and *Store* are currently not taken into account and will always operate as checked on.
- Save
It is not possible to *Save* a project that was opened from a network location.