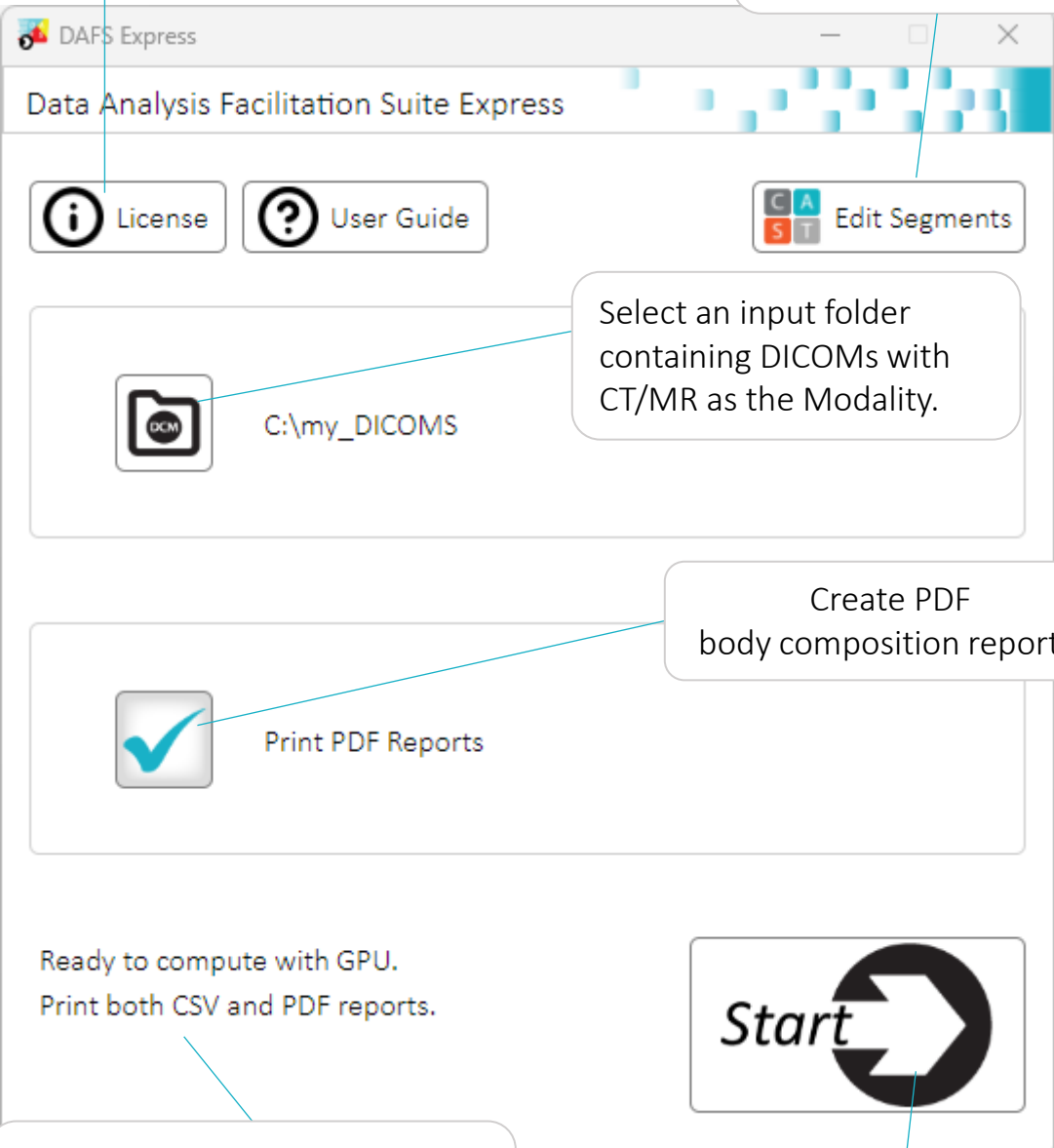


# DAFS Express User Guide



Check license information.

Open viewer to export DICOMs or edit segmentations.



Select an input folder containing DICOMs with CT/MR as the Modality.

Create PDF body composition reports.

Ready to compute with GPU.  
Print both CSV and PDF reports.

Messages indicating compute device (compatible GPUs) and types reports to generate.

Start processing or reprocessing.



# Cross Modality Annotation and Segmentation Tool

## Keyboard and mouse shortcuts

(\* requires mouse cursor to be on ViewPort)

Hide/show all segments

**G**

Load next DICOM

**D**

or

**S**

Load previous DICOM

**A**

or

**W**

Zoom\*



or

**CTRL**

+



Select tool

**ALT**

+

Pen

**1**

Erase

**2**

Pointer

**3**

Pan\*



or

**SHIFT**

+



Enable crosshair

**C**

Diameter with Pen or Eraser selected

**SHIFT**

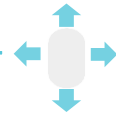
+



Move Crosshair

**SHIFT**

+



Recommended to enable crosshair when using this function.

Apply or erase segmentation (tool dependent)\*



Hide/show tool panel

**CTRL**

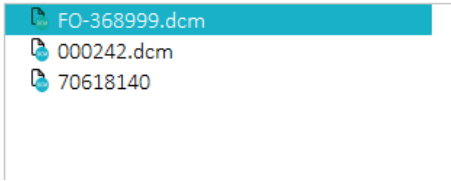
+

**1**

Open User Guide

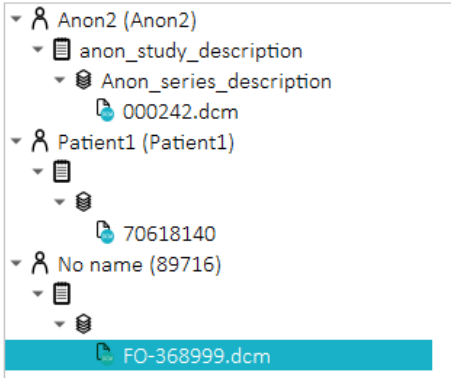
**U**

# Scan List Hierarchy View



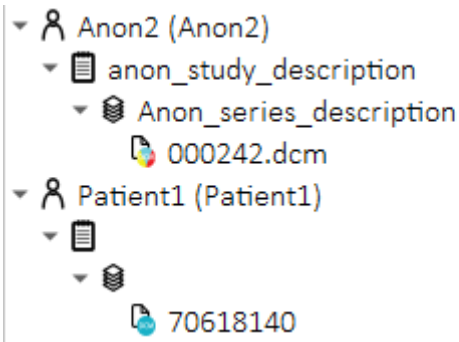
## Flat View

Shows DICOM files within the folder in a flat structure.



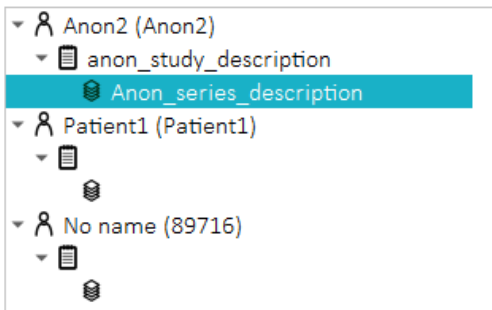
## Hierarchical View

Shows DICOM files within the folder in a hierarchical structure, categorized by Patient ID, Study Description and the Series Description.



- ← Patient ID
- ← Study Description
- ← Series Description
- ← Segmented DICOM slice

- ← Raw DICOM slice



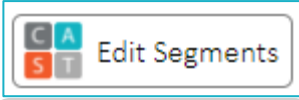
## MPR Series View

Shows DICOM Series without individual DICOM files within the folder in a hierarchical structure, categorized by Patient ID, Study Description and the Series Description.

An entire Series can be loaded to make slice selection and export from a Series easier by enabling coronal and sagittal views.

MPR Series View must be disabled to view segmented DICOMs.

# Export DICOMs from a Series



1. Click CAST to open the viewer.

2. Choose a folder containing DICOM scan.

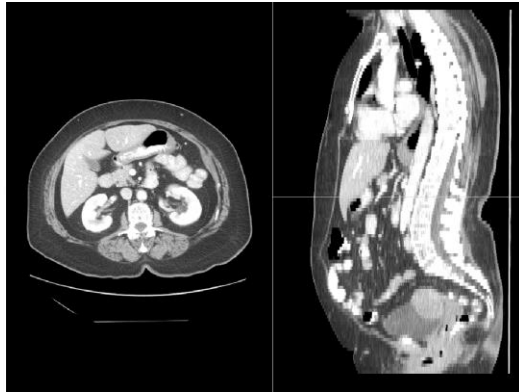
3. Enable MPR (Multiplanar Reconstruction) and click on the MPR-ready series to load it.



▼ Patient1 (Patient1)

▼ Study

MPR-ready series




4. Scroll in the axial view or hold shift and move the mouse in the sagittal or coronal views to choose an axial slice to export.

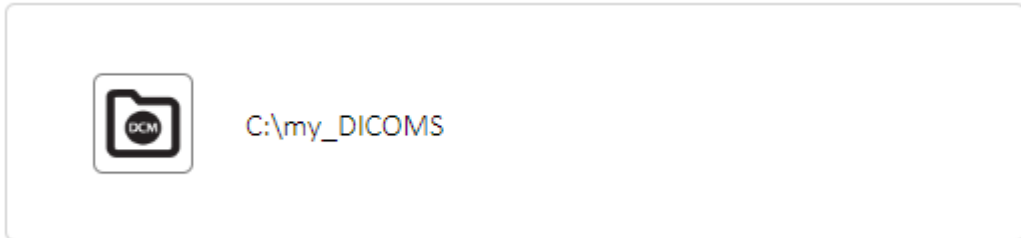
Close CAST and use DAFS Express to segment your exported DICOMs all at once! See the next page.

5. Click the Export button.

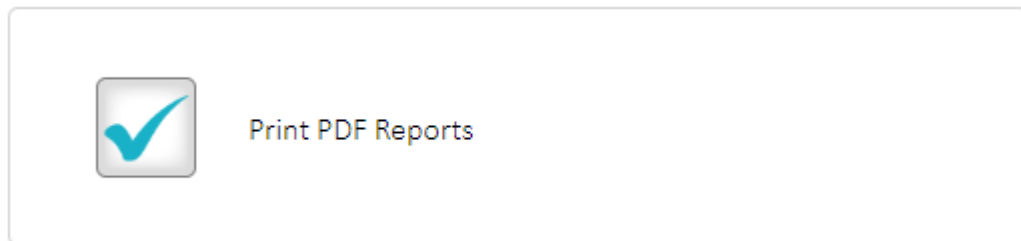
5. Browse for the folder you would like to export to, rename (optional) and save.

# Segmenting and Processing DICOMs

1. Select a folder containing the DICOM (CT and/or MR Modality) files as your input!  
 Warning: ALL DICOMs within this folder will be processed, including those inside subfolders. Ensure only DICOMs you want processed are inside the folder you select before proceeding.



2. Enable to create Body Composition PDF reports for each DICOM. (Optional) DAFS Express will only create a CSV file if this option is not enabled.

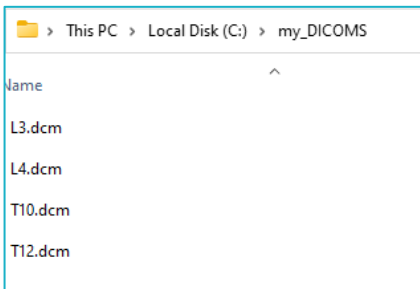


3. Click Start.

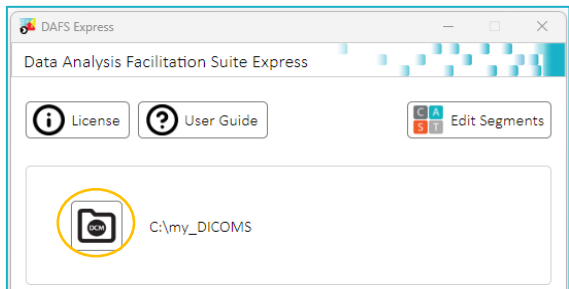


4. Find reports in your selected folder.

# Segmenting and Processing DICOMs Example



1. Your folder containing DICOMs to segment.

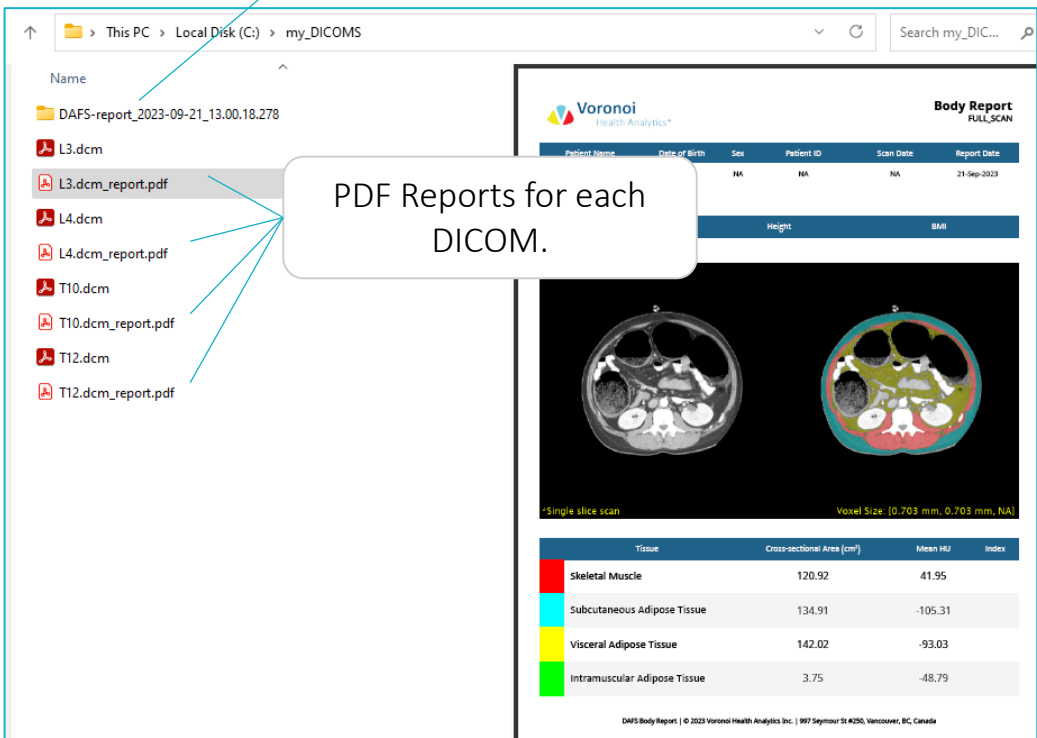


2. Select the folder in DAFS Express.



3. Choose the option to print PDF reports for each DICOM and press Start.

Single CSV report for all DICOMs found in here.




Patient Name	Date of Birth	Sex	Patient ID	Scan Date	Report Date
NA	NA	NA	NA	21 Sep-2023	

Tissue	Cross-sectional Area (cm <sup>2</sup> )	Mean HU	Index
Skeletal Muscle	120.92	41.95	
Subcutaneous Adipose Tissue	134.91	-105.31	
Visceral Adipose Tissue	142.02	-93.03	
Intramuscular Adipose Tissue	3.75	-48.79	

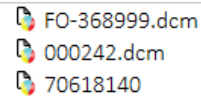
# Viewing and Editing segmented DICOMs



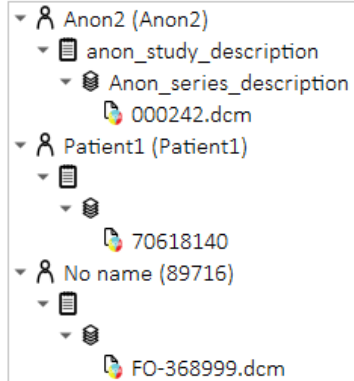
1. After segmenting a folder of DICOMs, click CAST to open the viewer.

2. The segmented DICOMs will appear with this icon  as shown.

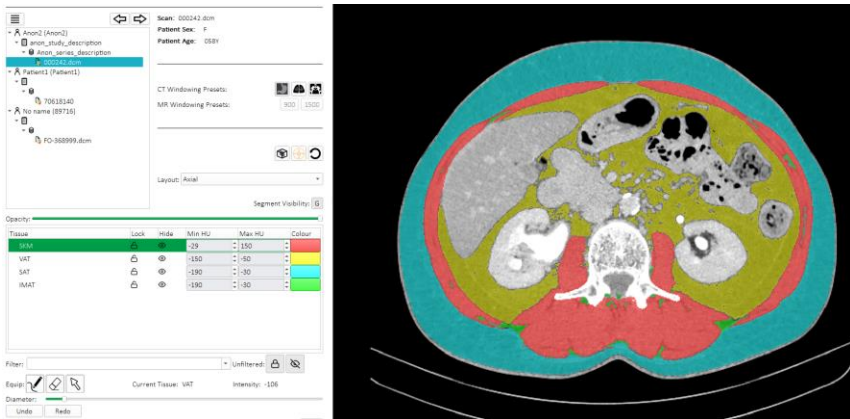
Flat view



Hierarchical view



3. Click on a DICOM to load.



4. Select tissue and Use Pen and Erase to edit. See page 3 for CAST shortcuts.

5. Process again to print new results to csv and/or PDF. See the next page.

4. Save after editing.

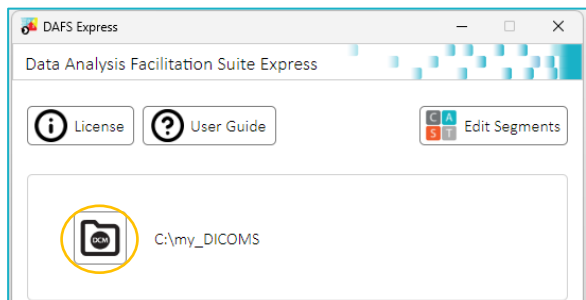




# Reprocessing Results After Editing Segmentations



1. Ensure ALL PDF reports from your folder are not open in any other programs! DAFS Express will not be able to overwrite reports that are open in another program.



2. Select the folder in DAFS Express.

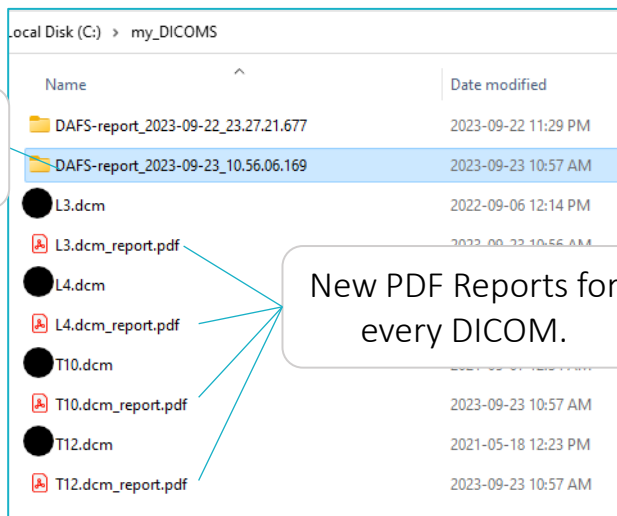


Print PDF Reports

3. Choose the option to print PDF reports for each DICOM and press Start.

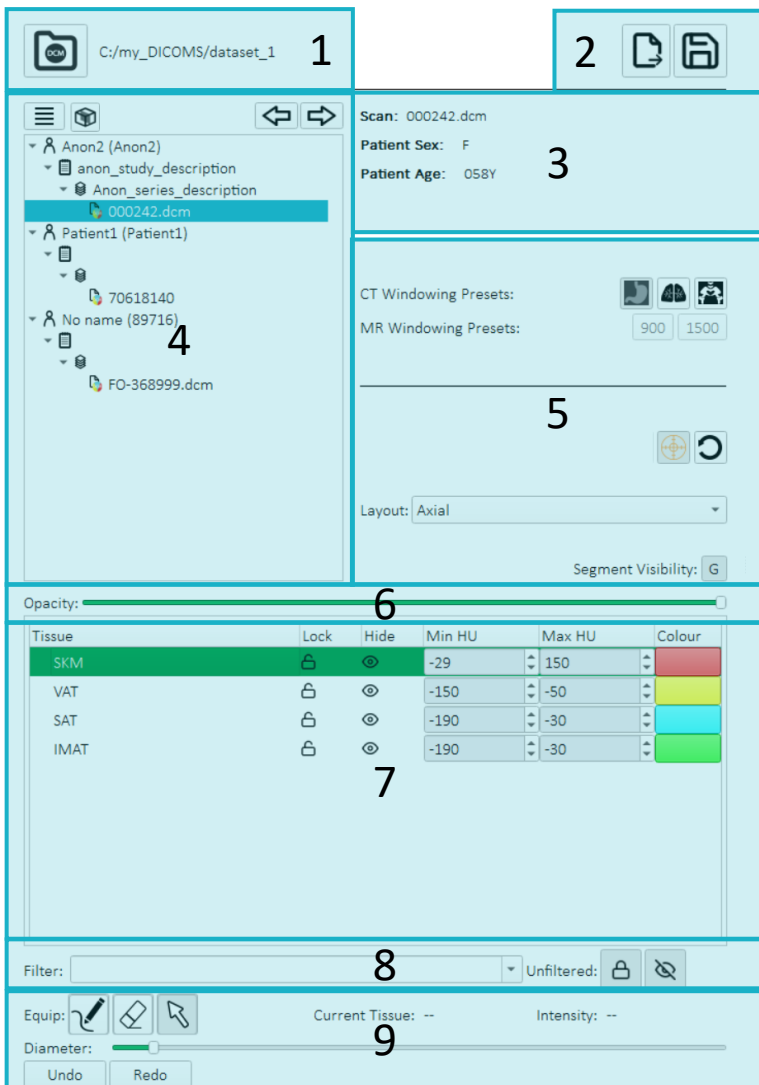


New CSV report for all DICOMS found in here.



Tip: If you wish to reprocess the results for only one DICOM, you can separate it into its own folder and select that folder as your input.

# Appendix



1. Select an Input Folder.
2. Export and Save buttons
3. Information panel for the loaded scan.
4. Scan List showing all DICOMs in the input folder. Use Next and Previous to navigate through DICOMs in the list and Load Scan to load them into the Segmenter. Toggle between Flat or Hierarchical DICOM display structure and toggle MPR on and off.
5. ViewPort settings.
  - Adjust CT and MR windows.
  - Enable crosshair.
  - Reset ViewPort to the Center of the image.
  - Choose from multiple ViewPort layouts.
  - Segment Visibility  Hide/show
6. Configure the opacity of the segmentation.
7. Segment list – choose from a list of available segments to edit. Lock segments to prevent unwanted edits and Hide segments to disable visibility in the ViewPort.
8. Filter segments in the Segment list. Unfiltered segments will not appear in the Segment list. By default, unfiltered segments will be locked and hidden (no overwriting and visualization).
9. Editing tools.
  - Equip pen and erase tools.
  - Adjust the diameter of the pen or eraser.
  - Undo and redo changes.

## Filtering the Segment list

Type in tissue names separated by semi-colon or hyphen and press Enter to display them in the Segment list, thereby, narrowing the focus of segmentation QC to only segments you wish to see and edit. Examples:

- ALL will display all available segments for the scan.
- SKM;VAT will display SKM and VAT segments only.
- SKM-VAT will display all segments between SKM and VAT.

For Unfiltered segments:



Segments not in the Segment list cannot be overwritten or seen.



Segments not in the Segment list can be overwritten but not seen.



Segments not in the Segment list can be overwritten and seen.

# Supported GPUs

GPU utilization can be enabled for automated segmentation and annotation processing. Using GPUs may decrease processing time by 10 times or more when compared to CPU.

Recommended GPU: Nvidia GeForce RTX 2060 or higher.

List of supported Nvidia GPU microarchitectures and tested graphics card models:

- Ada LoveLace
- Ampere
- Turing
- Pascal

If you think you may have a compatible GPU, but DAFS is not detecting it, try **updating Nvidia drivers**.

*Note: DAFS Express may also be compatible with other graphics card models not listed above with the supported microarchitectures.*

# Publish CSV Dictionary

*CT CSV example shown below.*

*MR values are non-restricted intensities.*

*MR CSV will not contain measurements for IMAT tissues.*

folder	The folder where DAFS Express found the DICOM file.
file_name	DICOM file name.
voxel_size_WxLxH	Pixel size in mm of the DICOM width and length (height not applicable).
img_size_WxLxH	Dimensions of the DICOM width, length and height.
SKM[-29,150];cross_sectional_area_pixels	Skeletal muscle within the range of -29 to 150 HU number of pixels.
SKM[-29,150];cross_sectional_area_cm2	Skeletal muscle within the range of -29 to 150 HU cross-sectional area in cm2.
SKM[-29,150];HU_mean	Skeletal muscle within the range of -29 to 150 HU mean HU.
SKM[-29,150];HU_std	Skeletal muscle within the range of -29 to 150 HU standard deviation HU.
SKM[-29,150];HU_median	Skeletal muscle within the range of -29 to 150 HU median HU.
SKM[-29,150];HU_min	Skeletal muscle within the range of -29 to 150 HU minimum HU.
SKM[-29,150];HU_max	Skeletal muscle within the range of -29 to 150 HU maximum HU.
SAT[-190,-30];cross_sectional_area_pixels	SAT within the range of -190 to -30 HU number of pixels.
SAT[-190,-30];cross_sectional_area_cm2	SAT within the range of -190 to -30 HU cross-sectional area in cm2.
SAT[-190,-30];HU_mean	SAT within the range of -190 to -30 HU mean HU.
SAT[-190,-30];HU_std	SAT within the range of -190 to -30 HU standard deviation HU.
SAT[-190,-30];HU_median	SAT within the range of -190 to -30 HU median HU.
SAT[-190,-30];HU_min	SAT within the range of -190 to -30 HU minimum HU.
SAT[-190,-30];HU_max	SAT within the range of -190 to -30 HU maximum HU.
VAT[-150,-50];cross_sectional_area_pixels	VAT within the range of -150 to -50 HU number of pixels.
VAT[-150,-50];cross_sectional_area_cm2	VAT within the range of -150 to -50 HU cross-sectional area in cm2.
VAT[-150,-50];HU_mean	VAT within the range of -150 to -50 HU mean HU.
VAT[-150,-50];HU_std	VAT within the range of -150 to -50 HU standard deviation HU.
VAT[-150,-50];HU_median	VAT within the range of -150 to -50 HU median HU.
VAT[-150,-50];HU_min	VAT within the range of -150 to -50 HU minimum HU.
VAT[-150,-50];HU_max	VAT within the range of -150 to -50 HU maximum HU.
IMAT[-190,-30];cross_sectional_area_pixels	IMAT within the range of -190 to -30 HU number of pixels.
IMAT[-190,-30];cross_sectional_area_cm2	IMAT within the range of -190 to -30 HU cross-sectional area in cm2.
IMAT[-190,-30];HU_mean	IMAT within the range of -190 to -30 HU mean HU.
IMAT[-190,-30];HU_std	IMAT within the range of -190 to -30 HU standard deviation HU.
IMAT[-190,-30];HU_median	IMAT within the range of -190 to -30 HU median HU.
IMAT[-190,-30];HU_min	IMAT within the range of -190 to -30 HU minimum HU.
IMAT[-190,-30];HU_max	IMAT within the range of -190 to -30 HU maximum HU.

# License and Information

Expiration date – Date of license expiry.

Scans processed – The number of unique scans that have been processed out of the total number of available scans provisioned in the license.

Scans remaining – The number of available scans left in the license.

# System Directories



The following folder names are invalid folder names. Input folders cannot consist of the following folder name patterns.

- logs
- csvs
- SliceSelection
- quickchecks
- DAFS-report
- 3DSlicer-workflow
- tmp