# LIFEx v7.4.0
## Announcement
## — LIFEx —

C. Nioche, F. Orlhac, I. Buvat

institut Curie

LITO
Laboratoire d'Imagerie Translationnelle en Oncologie

cea

Inserm
La science pour la santé
From science to health

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université PARIS-SACLAY

# What is new?

LIFEx version 7.4.0
Last update of document: 2022/11/28

# CONTENTS

Statistics of the latest version
Main / Series updates
Protocols updates
ROI updates

# CONTENTS

Statistics of the latest version

This part will be removed from the next new version campaign.

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# Compagnes Email

C. Nioche

sendinblue
https://fr.sendinblue.com/

**Sending:**
300 mails / 20 days

| ID | NOM | DESTINATAIRES | OUVERTS | CLIQUÉ | DÉSINSCRITS | PLAINTES | BOUNCES | DATE D'ENVOI |
|---|---|---|---|---|---|---|---|---|
| #20 | ★ LIFEx v7.3.0 now available | 275 100% | 88 32,08% Détails | 11 4% | 0 0% | 1 0,36% | 0 0% | 09 Oct, 2022 15:30 |
| #19 | ★ LIFEx v7.3.0 now available | 300 100% | 89 30,28% Détails | 6 2,03% | 1 0,34% | 0 0% | 5 1,67% | 08 Oct, 2022 15:31 |
| #18 | ★ LIFEx v7.3.0 now available | 300 100% | 96 32,27% Détails | 5 1,69% | 2 0,68% | 0 0% | 4 1,33% | 07 Oct, 2022 15:31 |
| #17 | ★ LIFEx v7.3.0 now available | 300 100% | 125 42,57% Détails | 12 4,08% | 0 0% | 0 0% | 6 2% | 06 Oct, 2022 15:32 |
| #16 | ★ LIFEx v7.3.0 now available | 300 100% | 115 38,82% Détails | 5 1,69% | 2 0,68% | 0 0% | 7 2,33% | 05 Oct, 2022 15:31 |
| #15 | ★ LIFEx v7.3.0 now available | 300 100% | 109 36,72% Détails | 11 3,72% | 5 1,69% | 0 0% | 4 1,33% | 04 Oct, 2022 15:31 |
| #14 | ★ LIFEx v7.3.0 now available | 300 100% | 120 41,63% Détails | 13 4,50% | 3 1,04% | 0 0% | 11 3,67% | 03 Oct, 2022 15:31 |
| #13 | ★ LIFEx v7.3.0 now available | 300 100% | 112 37,96% Détails | 10 3,38% | 3 1,01% | 0 0% | 4 1,33% | 02 Oct, 2022 15:31 |
| #12 | ★ LIFEx v7.3.0 now available | 300 100% | 112 38,68% Détails | 7 2,42% | 0 0% | 0 0% | 11 3,67% | 01 Oct, 2022 15:30 |
| #11 | ★ LIFEx v7.3.0 now available | 300 100% | 86 29,55% Détails | 9 3,09% | 2 0,69% | 0 0% | 9 3% | 30 Sep, 2022 15:31 |
| #10 | ★ LIFEx v7.3.0 now available | 300 100% | 112 38,49% Détails | 5 1,72% | 3 1,03% | 0 0% | 9 3% | 29 Sep, 2022 15:31 |
| #9 | ★ LIFEx v7.3.0 now available | 300 100% | 97 33,20% Détails | 8 2,73% | 1 0,34% | 0 0% | 7 2,33% | 28 Sep, 2022 15:30 |
| #8 | ★ LIFEx v7.3.0 now available | 300 100% | 111 38,11% Détails | 6 2,07% | 1 0,34% | 0 0% | 10 3,33% | 27 Sep, 2022 15:32 |
| #7 | ★ LIFEx v7.3.0 now available | 300 100% | 98 33,87% Détails | 13 4,48% | 2 0,69% | 0 0% | 10 3,33% | 26 Sep, 2022 15:31 |

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# Compagnes Email

C. Nioche

sendinblue
https://fr.sendinblue.com/

Mardi.20-09-2022 | Dimanche.09-10-2022 | Voir les statistiques

**Septembre, 2022**

| LU | MA | ME | JE | VE | SA | DI |
|---|---|---|---|---|---|---|
| 29 | 30 | 31 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |

**Octobre, 2022**

| LU | MA | ME | JE | VE | SA | DI |
|---|---|---|---|---|---|---|
| 26 | 27 | 28 | 29 | 30 | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 1 | 2 | 3 | 4 | 5 | 6 |

| | |
|---|---|
| Total d'envois | 20 |
| Total destinataires | 5 975 |
| Total ouvertures | 1 723 |
| Total clics | 175 |
| Total désinscrits | 45 |
| Total Répondus | 0 |
| Total Soft + Hard Bounces | 157 |

| Taux d'ouverture | Taux de clics | Taux de désinscription |
|---|---|---|
| 35,39% Détails | 3,01% | 0,77% |

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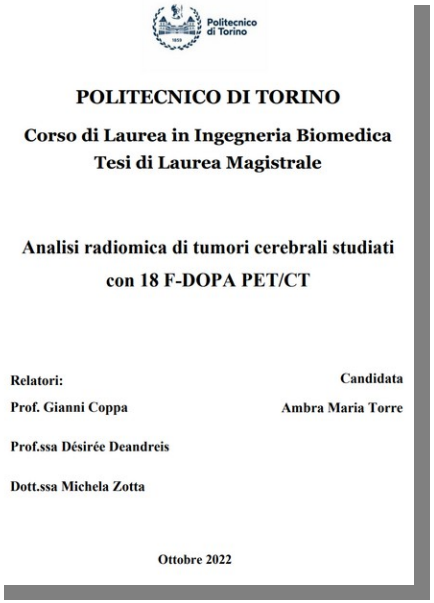
# Users testimonials

C. Nioche



Politecnico di Torino

**POLITECNICO DI TORINO**

**Corso di Laurea in Ingegneria Biomedica**
**Tesi di Laurea Magistrale**

**Analisi radiomica di tumori cerebrali studiati con 18 F-DOPA PET/CT**

**Relatori:**
**Prof. Gianni Coppa**
**Prof.ssa Désirée Deandreis**
**Dott.ssa Michela Zotta**

**Candidata**
**Ambra Maria Torre**

**Ottobre 2022**

**Capitolo 4**

**Discussioni**

**4.1 Considerazioni finali**

Per essere largamente applicabile, un modello scaturito dalle features radiomiche deve basarsi su una definizione univoca delle espressioni delle features, del ricampionamento spaziale e della discretizzazione dei livelli di intensità. L'uso di free software come LIFEx ha rappresentato un enorme passo in avanti nella possibilità di validare i modelli in coorti indipendenti tra di loro, dal momento che ha comportato un certo grado di standardizzazione. Infatti in LIFEx buona parte delle features estratte seguono le formule standardizzate proposte da IBSI (Image Biomarker Standardization Initiative). La scelta del ricampionamento spaziale e della discretizzazione dei livelli di intensità ha una ricaduta fondamentale sulla robustezza dei risultati dato che le features radiomiche possono dare dei risultati molto sensibili agli artefatti da movimento e al rumore. Si è deciso di attuare una discretizzazione assoluta usando 64 livelli tra 0 e 20 SUV, come suggerito nell'ambito della PET nella guida per l'utente di LIFEx, proprio per ottenere risultati maggiormente robusti.

> AM Torre. Analisi radiomica di tumori cerebrali studiati con 18F-DOPA PET/CT Radiomics analysis of brain tumor studied with 18F-DOPA PET/CT – PhD 2022

In order to be widely applicable, a model derived from radiomic features must be based on an unambiguous definition of feature expressions, spatial resampling and discretization of intensity levels. The use of free software such as LIFEx represented a huge step forward in the possibility of validating models in independent cohorts, since it entailed a certain degree of standardisation.
In fact, in LIFEx most of the features extracted follow the standardised formulae proposed by IBSI (Image Biomarker Standardisation Initiative). The choice of spatial resampling and discretisation of intensity levels has a fundamental impact on the robustness of the results, given that radiomic features can be very sensitive to motion artefacts and noise. It was decided to implement absolute discretisation using 64 levels between 0 and 20 SUVs, as suggested in the PET user's guide of LIFEx, precisely to obtain more robust results.

# Users testimonials

C. Nioche

Hannequin P, Decroisette C, Kermanach P, Berardi G, Bourbonne V. FDG PET and CT radiomics in diagnosis and prognosis of non-small-cell lung cancer. Transl Lung Cancer Res 2022;11(10):2051-2063. doi: 10.21037/tlcr-22- 158



training/testing procedure. Whatever the practical impact of presenting negative results must be considered (39). The differences of findings between several institutions could be explained by specificities of populations: ethnics and social status of patients as well as kind and level of medical care, this confusion bias being rarely taken into account in available data. Technical development of PET-CT devices must also be taken into account as well as specificities of the radiomics software and the way to handle it. For information, LifeX (22) team has a project to develop an application that will enables the evaluation, in a multicenter way, of radiomics and\or AI models proposed for the management of lung cancer patients. Multicenter validation of models remains indeed essential to consider for their clinical use. Several studies focused on the lack of harmonization of radiomics (38,39) while others (10-12,40,41) underscore more sophisticated methodology such as principal components analysis (PCA), artificial intelligence (AI), multiblock discriminant analysis (42). However these techniques can be explored in research centers but are not suited for a clinical use which needs simple and robust procedures. Nowadays, one should be cautious in applying results obtained by others and the creation of one's own survival analysis seems necessary, before calculating the optimal local suited radiomics signature.

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Next release v7.4.0

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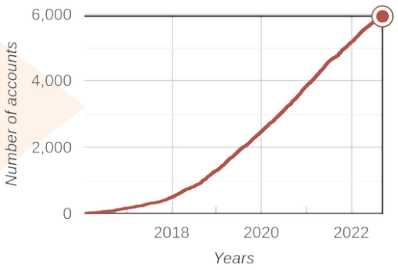
# Acknowledgements

Dear LIFEx users,

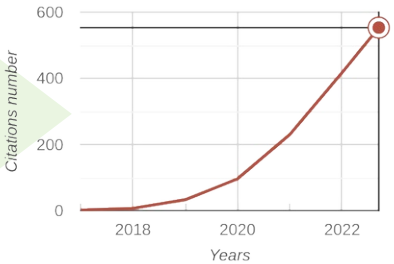
We are pleased to announce the release of LIFEx v7.4.0

We would like to take this opportunity to thank all 6.200 LIFEx users for their feedback and relevant suggestions. We took into account your comments to enhance the software and produce this version.
We hope you will enjoy it.

Do not hesitate to download this new release and replace your old LIFEx version. Your feedback will always be welcome.




Evolution of the number of accounts
(from our site web)




Evolution of the number of citing LIFEx
(from PubMed)

## LIFEx is free of charge.

Please help us to keep it free by always quoting the LIFEx reference: (see below)

Please note that the correct reference to be cited is:
C Nioche, F Orlhac, S Boughdad, S Reuzé, J Goya-Outi, C Robert, C Pellot-Barakat, M Soussan, F Frouin, and I Buvat. LIFEx: a freeware for radiomic feature calculation in multimodality imaging to accelerate advances in the characterization of tumor heterogeneity. Cancer Research 2018; 78(16):4786-4789

# LIFEx v7.4.0
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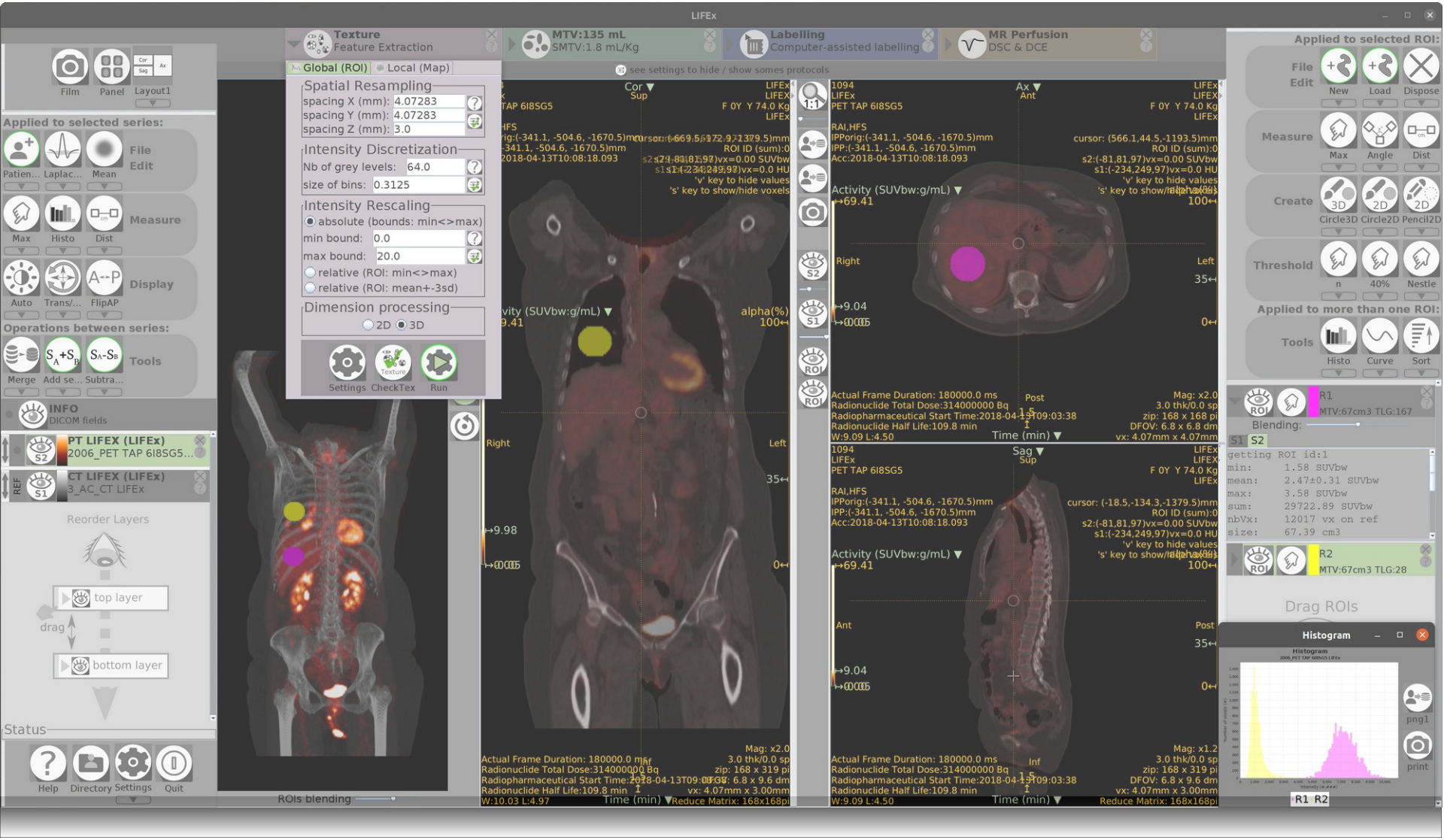
# Interface screenshot

C. Nioche



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Main / Series updates

# LIFEx v7.4.0
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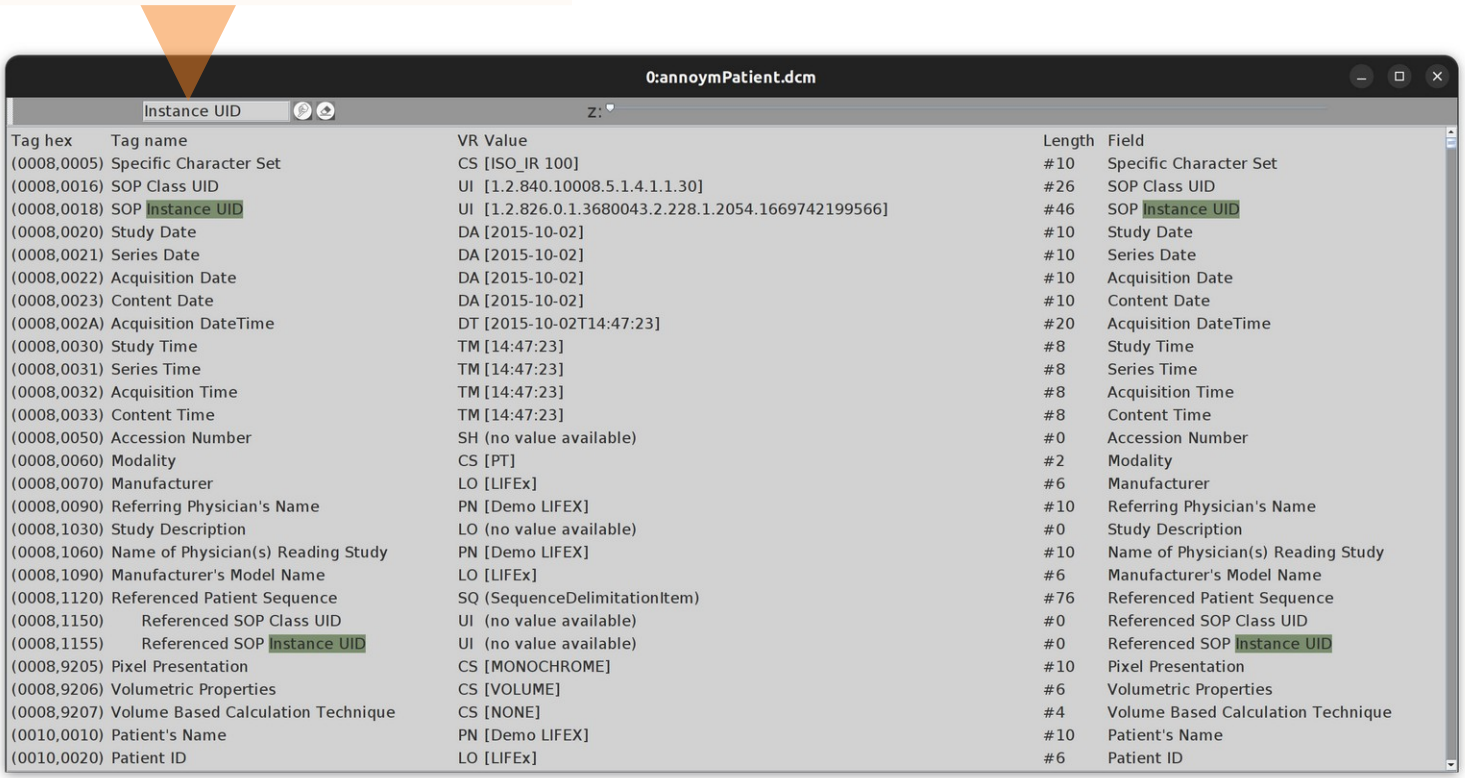
Main:
- added: search field in DICOM viewer
- fixed: (group, item) of DICOM tag in viewer DICOM




| Tag hex | Tag name | VR | Value | Length | Field |
|---|---|---|---|---|---|
| (0008,0005) | Specific Character Set | CS | [ISO_IR 100] | #10 | Specific Character Set |
| (0008,0016) | SOP Class UID | UI | [1.2.840.10008.5.1.4.1.1.30] | #26 | SOP Class UID |
| (0008,0018) | SOP Instance UID | UI | [1.2.826.0.1.3680043.2.228.1.2054.1669742199566] | #46 | SOP Instance UID |
| (0008,0020) | Study Date | DA | [2015-10-02] | #10 | Study Date |
| (0008,0021) | Series Date | DA | [2015-10-02] | #10 | Series Date |
| (0008,0022) | Acquisition Date | DA | [2015-10-02] | #10 | Acquisition Date |
| (0008,0023) | Content Date | DA | [2015-10-02] | #10 | Content Date |
| (0008,002A) | Acquisition DateTime | DT | [2015-10-02T14:47:23] | #20 | Acquisition DateTime |
| (0008,0030) | Study Time | TM | [14:47:23] | #8 | Study Time |
| (0008,0031) | Series Time | TM | [14:47:23] | #8 | Series Time |
| (0008,0032) | Acquisition Time | TM | [14:47:23] | #8 | Acquisition Time |
| (0008,0033) | Content Time | TM | [14:47:23] | #8 | Content Time |
| (0008,0050) | Accession Number | SH | (no value available) | #0 | Accession Number |
| (0008,0060) | Modality | CS | [PT] | #2 | Modality |
| (0008,0070) | Manufacturer | LO | [LIFEx] | #6 | Manufacturer |
| (0008,0090) | Referring Physician's Name | PN | [Demo LIFEX] | #10 | Referring Physician's Name |
| (0008,1030) | Study Description | LO | (no value available) | #0 | Study Description |
| (0008,1060) | Name of Physician(s) Reading Study | PN | [Demo LIFEX] | #10 | Name of Physician(s) Reading Study |
| (0008,1090) | Manufacturer's Model Name | LO | [LIFEx] | #6 | Manufacturer's Model Name |
| (0008,1120) | Referenced Patient Sequence | SQ | (SequenceDelimitationItem) | #76 | Referenced Patient Sequence |
| (0008,1150) | Referenced SOP Class UID | UI | (no value available) | #0 | Referenced SOP Class UID |
| (0008,1155) | Referenced SOP Instance UID | UI | (no value available) | #0 | Referenced SOP Instance UID |
| (0008,9205) | Pixel Presentation | CS | [MONOCHROME] | #10 | Pixel Presentation |
| (0008,9206) | Volumetric Properties | CS | [VOLUME] | #6 | Volumetric Properties |
| (0008,9207) | Volume Based Calculation Technique | CS | [NONE] | #4 | Volume Based Calculation Technique |
| (0010,0010) | Patient's Name | PN | [Demo LIFEX] | #10 | Patient's Name |
| (0010,0020) | Patient ID | LO | [LIFEx] | #6 | Patient ID |

# Main / Series updates

C. Nioche

What has been added, changed or updated in this new release?
Here is a list of the most significant additions, changes or updates in LIFEx v7.4.0

Main:
- added: new layout (MIP Ax Cor Sag)

MIP:
- improved: window blocking under heavy use
- improved: increase default alpha blending of ROI on MIP frame
- fixed: mouse button operations are available on MacOS system
- improved: add "Click" and "Click40" tools on MIP frame with Shift+LMB
- improved: remove ROI on MIP frame with Shift+RMB

Series:
- added: shift of slice location with Ctrl+Mouse move (with takes into account the mouse displacement to calculate the shift location)
- fixed: ROIs don't disappear anymore after a screenshot of all view frames (.png)
- fixed: when binary file with orientation (ROI for example) is read to add a series,
  then the NEAREST_NEIGHBOR interpolation is chosen
  instead of the QUINTIC_LAGRANGIAN interpolation
- fixed: a bug prevented the series sorting from being done correctly

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Protocols updates

# LIFEx v7.4.0 Annoucement — LIFEx —

# MTV updates

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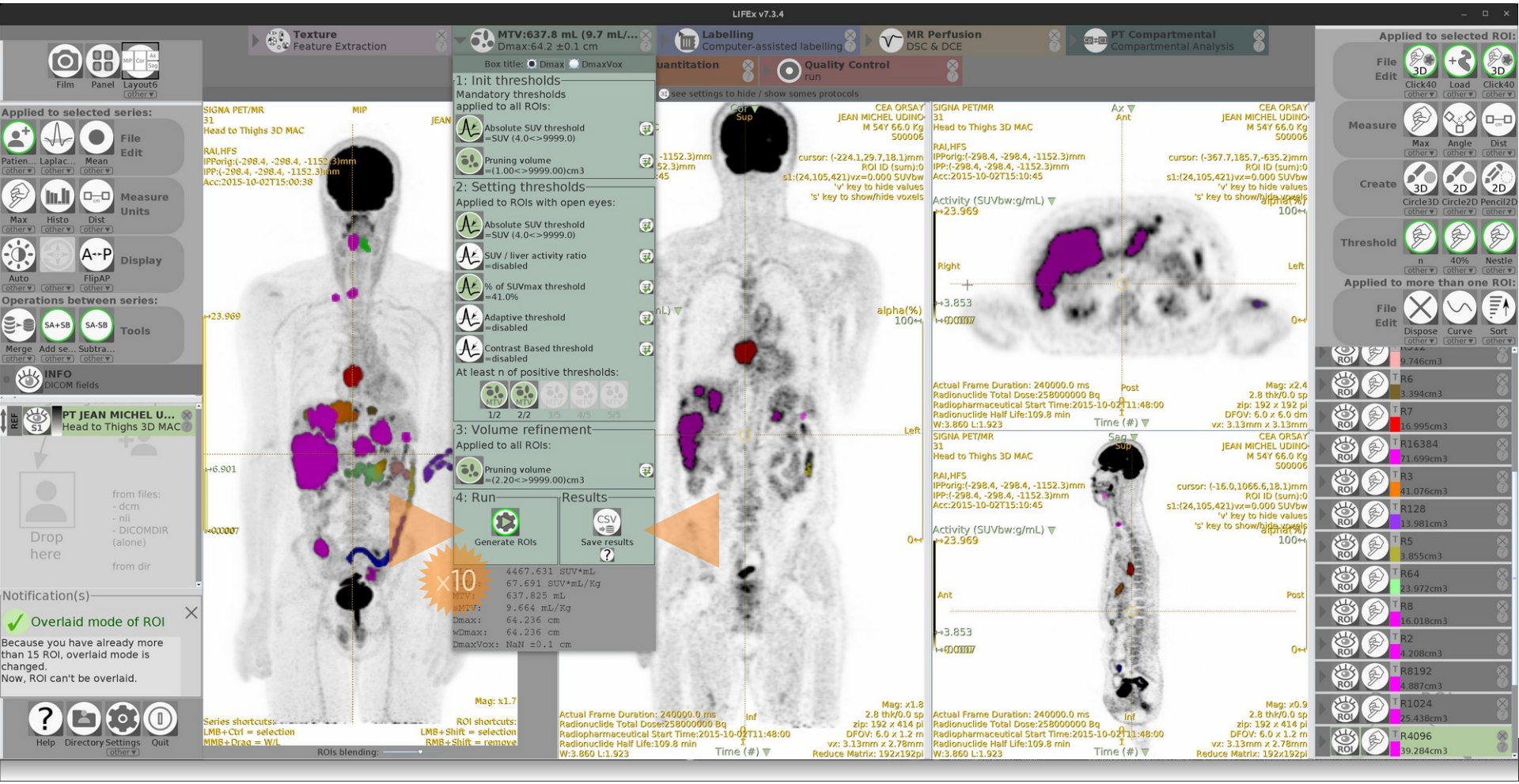
The MTV results has become independent of the automatic generation of ROIs
→ i.e. it can therefore now be saved with already existing ROIs

Acceleration of the semi-automatic segmentation process by a factor of 10

x10



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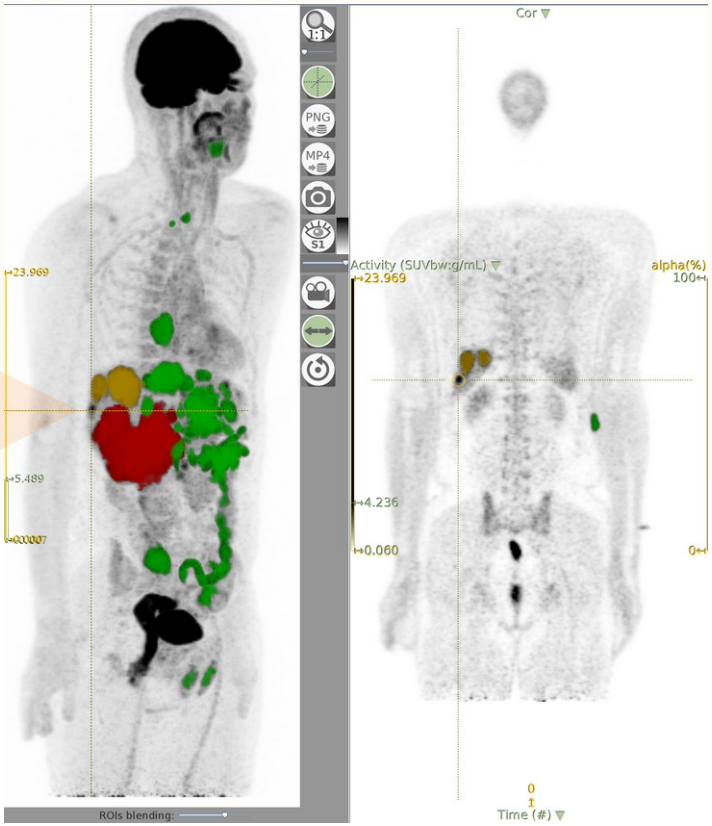
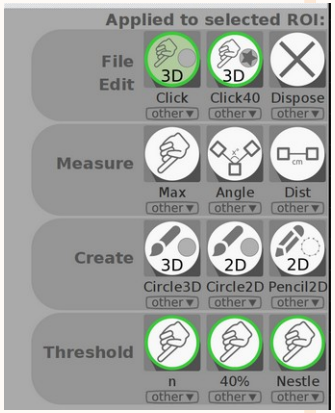
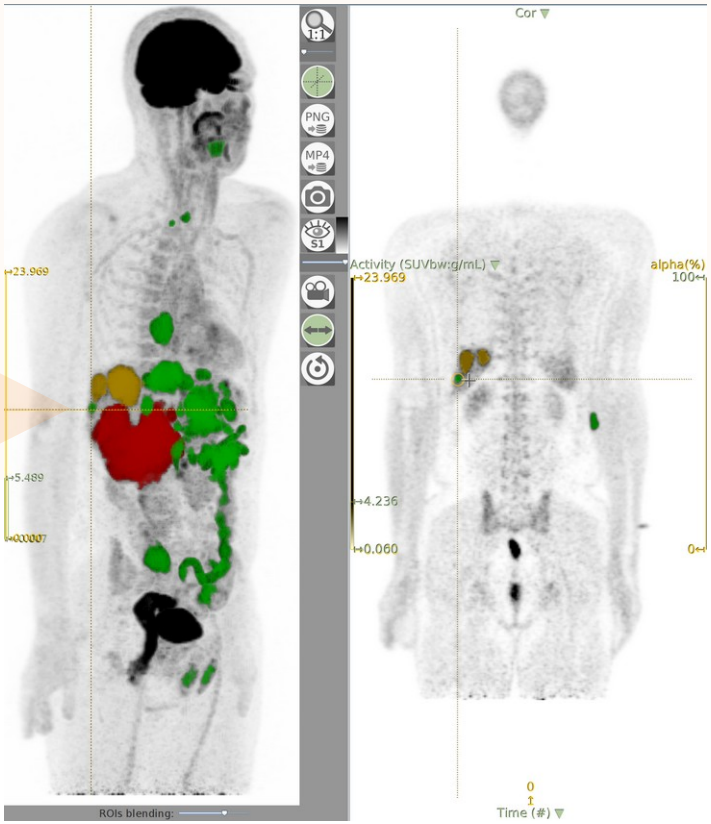
# MTV updates

C. Nioche

## MIP updates



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# MTV updates

C. Nioche

To remember the algorithm:
Click&Draw

## Click&Draw

Creates a VOI using the following approach:

- reading of the intensity (I) of the point the user clicked on
- 3D flood filler algorithm stopped at I ∗ 70/100 = SegF
- if volume(SegF) > 500cm3 = error "Out of allowed size"
- Imax = maximum intensity in SegF
- Nestle threshold (with beta = 0.3 and Imax) = ThresN
- VOI = 3D flood filler algorithm from the user point and stopped at ThresN

The result might be similar to that obtained using 40% thresholding but will be more robust to the background signal surrounding the tumor area. This click and draw method is part of the adaptive threshold menu.

(specially designed for PET images)

To remember the algorithm:
Click40&Draw

## Click40&Draw

The "click40" method is a variant tool.
The step SegF is made :
with I ∗ 40/100
instead of I ∗ 70/100.

(specially designed for PET images)

LIFEx v7.4.0
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# MTV updates

C. Nioche

## MTV updates (summary)

| Article definition | LIFEx <v7.3.1 | LIFEx >= v7.3.4 | LIFEx Legend |
|---|---|---|---|
| MTV | MTV(mL) | MTV(mL) | The tumor volume |
| TLG | TLG(SUV*mL) | TLG(SUV*mL) | MTV * SUVmean |
| SUVmean | SUVmean(SUV) | SUVmean(SUV) | The mean SUV value of the VOI |
| SUVmax | SUVmax(SUV) | SUVmax(SUV) | The SUV of the voxel with the highest SUV within the VOI |
| SUVpeak | no exist | MAX_peakmL(SUV) | The SUV of the 3mL with the highest SUV within the VOI (global peak) |
| | | | |
| Number of lesions | NumberOfROI | NumberOfROI | The number of separated lesion selections within the VOI |
| Dmax | Dmax | Dmax | The maximum distance between two lesions |
| DmaxBulk | MaxBindCOM(cm) | DmaxBulk(cm) | The maximum distance between the largest lesion and any other lesion |
| | | | |
| Spread | no exist | SUM_sumBindCOM(cm) | The sum of the distance between all lesions |
| SpreadBulk | sumBindCOM(cm) | BulkSumBindCOM(cm) | The sum of the distance between the largest lesion and all other lesions |
| Dvol | no exist | DiffVolBulkSmallest(mL) | The difference in volume between the largest and the smallest lesion |
| VolSpread | no exist | VolSpread | The sum of the differences in volume between all lesions |
| VolSpreadBulk | no exist | VolSpreadBulk | The sum of the differences in volume between the largest lesion and all other lesions |
| | | | |
| DSUVmax | no exist | DiffSUVmax | The difference in SUVmax between the lesion with the highest SUVmax and the lesion with the lowest SUVmax |
| DSUVmaxSum | no exist | DiffSUVmaxSum | The sum of the differences in SUVMax of all lesions |
| DSUVmaxBulk | no exist | DiffSUVmaxBulk | The difference in SUVmax between the largest lesion and the minimum of all SUVmax of other lesions |
| DSUVmaxSumBulk | no exist | DiffSUVmaxSumBulk | The sum of the differences in SUVmax between the largest lesion and all other lesions |
| DSUVmaxSumHot | no exist | DiffSUVmaxSumHot | The sum of the differences in SUVmax between the lesion with the highest SUVmax and all SUVmax of other lesions |
| | | | |
| DSUVpeak | no exist | DiffSUVpeak | The difference in SUVpeak between the lesion with the highest SUVpeak and the lesion with the lowest SUVpeak |
| DSUVpeakSum | no exist | DiffSUVpeakSum | The sum of the differences in SUVpeak of all lesions |
| DSUVpeakBulk | no exist | DiffSUVpeakBulk | The differences between the SUVpeak of the largest lesion and the SUVpeak of the lowest SUVpeak of all other lesions |
| DSUVpeakSumBulk | no exist | DiffSUVpeakSumBulk | The sum of the differences in SUVpeak between the largest lesion and all other lesions |
| DSUVpeakSumHot | no exist | DiffSUVpeakSumHot | The sum of the differences between the lesion with the highest SUVpeak and SUVpeak of all other lesions |

Julia Driessen, Gerben JC Zwezerijnen, Heiko Schöder, Esther EE Drees, Marie José Kersten, Alison J Moskowitz, Craig H Moskowitz, Jakoba J Eertink, Henrica CW De Vet, Otto S Hoekstra, Joseé M Zijlstra, Ronald Boellaard. The impact of semi-automatic segmentation methods on metabolic tumor volume, intensity and dissemination radiomics in 18F-FDG PET scans of patients with classical Hodgkin lymphoma. Journal of Nuclear Medicine Jan 2022, jnumed.121.263067; DOI: 10.2967/jnumed.121.263067

# LIFEx v7.4.0
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— LIFEx —

# MTV updates
C. Nioche

MTV protocol:
- added: legend of feature names on result file
- added: SUM_sumBindCOM(cm) feature (Spread feature -> The sum of the distances between all lesions)
- added: SUM_sumBindWCOM(cm) feature (sum of all bind WCOM of all ROI)
- added: SUVpeak0.5mL(SUV) feature
- added: SUVpeak1mL(SUV) feature
- added: NumberOfROI feature
- added: DiffVolBulkSmallest(mL) feature -> The difference in volume between the largest and the smallest lesions
- added: VolSpread feature -> The sum of the differences in volume between all lesions
- added: VolSpreadBulk feature -> The sum of the differences in volume between the largest lesion and all other lesions
- added: DiffSUVmax feature -> The difference in SUVmax between the lesion with the highest SUVmax and the lesion with the lowest SUVmax
- added: DiffSUVmaxSum feature -> The sum of the differences in SUVMax of all lesions
- added: DiffSUVmaxBulk feature -> The difference in SUVmax between the largest lesion and the minimum of all SUVmax of other lesions
- added: DSUVmaxSumBulk feature -> The sum of the differences in SUVmax between the largest lesion and all other lesions
- added: DiffSUVmaxSumHot feature -> The sum of the differences in SUVmax between the lesion with the highest SUVmax and all SUVmax of other lesions
- added: DiffSUVpeak feature -> The difference in SUVpeak between the lesion with the highest SUVpeak and the lesion with the lowest SUVpeak
- added: DiffSUVpeakSum feature -> The sum of the differences in SUVpeak of all lesions
- added: DiffSUVpeakBulk feature -> The differences between the SUVpeak of the largest lesion and the SUVpeak of the lowest SUVpeak of all other lesions
- added: DiffSUVpeakSumBulk feature -> The sum of the differences in SUVpeak between the largest lesion and all other lesions
- added: DiffSUVpeakSumHot feature -> The sum of the differences between the lesion with the highest SUVpeak and SUVpeak of all other lesions
- fixed: the minimum values are no longer zero.
- fixed: sum of all bind of COM is corrected
- changed: the MTV result has become independent of the automatic generation of ROIs: the MTV results can therefore now be saved with already existing ROIs
- changed: an extra digit after the decimal point of MTV (mL) feature
- changed: MTV script gives the same features as the "Save results" button of the protocol
- changed: COMofROI feature is renamed into COM
- changed: WeightedCOMOfROI feature is renamed into WCOM
- changed: sumBindCOM(cm) feature is renamed into BulkSumBindCOM (sum of the distance between the largest lesion and all other lesions=SpreadBulk feature)
- changed: avBindCOM(cm) feature is renamed into BulkMeanBindCOM(cm)
- changed: stdBindCOM(cm) feature is renamed into BulkStdBindCOM(cm)
- changed: minBindCOM(cm) feature is renamed into BulkMinBindCOM(cm)
- changed: maxBindCOM(cm) feature is renamed into BulkMaxBindCOM(cm)
- changed: avTotBindCOM(cm) feature is renamed into BulkMeanBindCOM(cm)
- changed: COM(vx) feature is renamed into BulkCOM(vx)
- changed: wCOM(vx) feature is renamed into BulkWCOM(vx)
- changed: sumBindWeightedCOM(cm) feature is renamed into BulkSumBindWCOM(cm)
- changed: avBindWeightedCOM feature is renamed into BulkMeanBindWCOM(cm)
- changed: stdBindWeightedCOM feature is renamed into BulkStdBindWCOM(cm)
- changed: minBindWeightedCOM feature is renamed into BulkMinBindWCOM(cm)
- changed: avTotBindWeightedCOM feature is renamed into BulkMeanBindWCOM(cm)

# Texture updates

C. Nioche

Texture protocol:
- added: areaUnderCurveCsh feature is now calculated on CT with negative intensities
- changed: AreaUnderCurveCsh renamed into AreaUnderCurveCIVH (Cumulative Intensity Volume Histogram)
- changed: in AreaUnderCurveCsh, binsize is (maximumGreyLevel - minimumGreyLevel) / 1000
  → IBSI, Intensity-volume histogram features / Arbitrary intensity units
- changed: Range feature is renamed into IntensityRange
- changed: Mean feature is renamed into MeanIntensity
- changed: Variance feature is renamed into IntensityVariance
- changed: Skewness feature is renamed into IntensitySkewness
- changed: Kurtosis feature is renamed into IntensityKurtosis
- changed: Median feature is renamed into MedianIntensity
- changed: MinimumGreyLevel feature is renamed into MinimumIntensity
- changed: MaximumGreyLevel feature is renamed into MaximumIntensity
- changed: 10thPercentile feature is renamed into 10thIntensityPercentile
- changed: 25thPercentile feature is renamed into 25thIntensityPercentile
- changed: 50thPercentile feature is renamed into 50thIntensityPercentile
- changed: 75thPercentile feature is renamed into 75thIntensityPercentile
- changed: 90thPercentile feature is renamed into 90thIntensityPercentile
- changed: InterquartileRange feature is renamed into IntensityInterquartileRange
- changed: MeanAbsoluteDeviation feature is renamed into IntensityBasedMeanAbsoluteDeviation
- changed: RobustMeanAbsoluteDeviation feature is renamed into IntensityBasedRobustMeanAbsoluteDeviation
- changed: MedianAbsoluteDeviation feature is renamed into IntensityBasedMedianAbsoluteDeviation
- changed: CoefficientOfVariation feature is renamed into IntensityBasedCoefficientOfVariation
- changed: QuartileCoefficientOfDispersion feature is renamed into IntensityBasedQuartileCoefficientOfDispersion
- changed: Energy feature is renamed into IntensityBasedEnergy
- changed: RootMeanSquare is renamed into RootMeanSquareIntensity

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ROI updates

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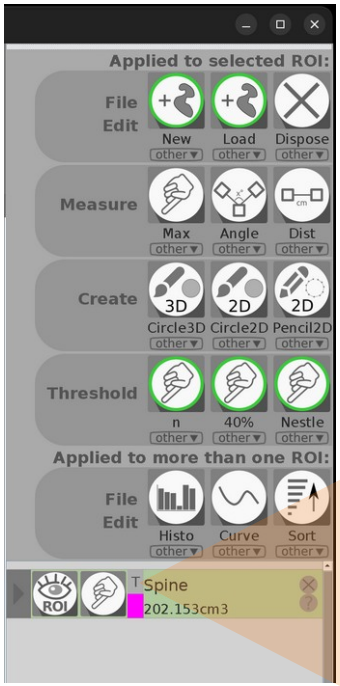
# ROI updates

C. Nioche

ROI:
quick editing with predefined organ names



# ROI updates

C. Nioche

ROI:
- deleted: all uint8 of nifti format (keep only uint16 to have more than 16 ROI with Save-M menu)
- added: quick labelling with predefined organ names
- added: remove ROI with click on ROI on image with combined right button mouse and shift (=Shit+RMB)
- changed: All delete actions delete the file (as before) but also unload it from the application.
- improved: creating a new ROI no longer disables the Nii save button
- improved: the volume of SUVpeak1mL is closer to the real desired volume 1mL (the result is not much changed)
- improved: the volume of SUVpeak0.5mL is closer to the real desired volume 0.5mL (the result is not much changed)
- improved: ROIpeak is integrated by default in the basic ROI statistics calculations
- fixed: issue when drawing segmentation with absolute filter threshold activated
- fixed: issue on translate ROI
- fixed: issue on dispose all ROI
- fixed: freeze of union ROI when number of ROI to be merged is greater than 10
- fixed: series not found in ROI comparison tool
- fixed: new alert message if the 3D crosshairs are not in the area to be filled, or the filling is in an open structure.

# End of the announcement

don't forget

LIFEx v7.4.0
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# LIFEx is still evolving

C. Nioche

Other functionalities are being added every week.
Stay tuned !
We hope you go on enjoying LIFEx !

## LIFEx is free of charge.

Please help us to keep it free by always quoting the LIFEx reference: (see below)

Please note that the correct reference to be cited is:
C Nioche, F Orlhac, S Boughdad, S Reuzé, J Goya-Outi, C Robert, C Pellot-Barakat, M Soussan, F Frouin, and I Buvat. LIFEx: a freeware for radiomic feature calculation in multimodality imaging to accelerate advances in the characterization of tumor heterogeneity. Cancer Research 2018; 78(16):4786-4789