
Scripting in LIFEx

LITO - team meeting
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Why Scripting ?

What are the benefits ?

- ✓ to automate the tasks if there are many patients
- ✓ to recalculate the data by guaranteeing the reproducibility
- ✓ to ensure traceability in case of doubtful results



.txt file

Operations

Format conversion

Spatial resampling

Filtering

Thresholding

Format conversion

More information can be found on the LIFEx's website
https://www.lifexsoft.org/.../Documentation/.../LIFExScripts_v7.6.0.pdf => section 3.3



numbering starts at 0

```
#####  
#LIFEx script: convert image from DCM to NIFTI  
#####
```

#Patients

```
LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/Images/P1_PT_SUV.dcm  
LIFEx.Patient0.Series0.Operation0=Save nii uint16  
LIFEx.Patient0.Series0.Operation0.Output.Directory=E:/Project/.../Database_1/Patient_1/Images/  
  
LIFEx.Patient1.Series0=E:/Project/.../Database_1/Patient_2/Images/P2_PT_SUV.dcm  
LIFEx.Patient1.Series0.Operation0=Save nii uint16  
LIFEx.Patient1.Series0.Operation0.Output.Directory=E:/Project/.../Database_1/Patient_2/Images/
```

- Save anonymous series in DICOM format (only if loaded series is in DICOM format too):
LIFEx.Patient0.Series0.Operation0=**Save anonymous dcm**
- Save series in DICOM format (only if loaded series is in DICOM format too):
LIFEx.Patient0.Series0.Operation0=**Save dcm**
- Save series in nrrd format:
LIFEx.Patient0.Series0.Operation0=**Save nrrd**
- Save series in nifti format (float 32 bits):
LIFEx.Patient0.Series0.Operation0=**Save nii float32**
- Save series in nifti format (uint 16 bits) (2 possibilities):
LIFEx.Patient0.Series0.Operation0=**Save nii uint16**
LIFEx.Patient0.Series0.Operation0=**Save nii**

In the example below

if the image is not a
single dicom file => set
the name of the folder
containing .dcm files

```
#####  
#LIFEx script: image resampling  
#####
```

```
#Patients  
LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/Images/P1_PT_SUV.nii.gz  
LIFEx.Patient0.Series0.Operation0=ResampleRescaling,4,4,4|Save nii  
LIFEx.Patient0.Series0.Operation0.Output.Directory=E:/Project/.../Database_1/Patient_1/Images/
```

```
LIFEx.Patient1.Series0=E:/Project/.../Database_1/Patient_2/Images/P2_PT_SUV.nii.gz  
LIFEx.Patient1.Series0.Operation0=ResampleRescaling,4,4,4|Save nii  
LIFEx.Patient1.Series0.Operation0.Output.Directory=E:/Project/.../Database_1/Patient_2/Images/
```

Filtering

More information can be found on the LIFEx's website
https://www.lifexsoft.org/.../Documentation/.../LIFExScripts_v7.6.0.pdf => section 3.3

LIFEx.Patient0.Series0.Operation0=**GaussianFilter,SigmaX,SigmaY,SigmaZ,CalculationDimension,WholeBody,PaddingMethod**

Example with **Sigma (x=2 mm, y=2mm, z=2mm)**, 3d calculation dimension, wholebody enable and reflect padding method:

LIFEx.Patient0.Series0.Operation0=GaussianFilter,2,2,2,3d,true,reflect

- float value Sigma is the FWHM/2 of kernels size in millimeter.

- 3d calculation dimension is between [2d, 3d]

- wholebody is always true in script

- padding method is between [reflect, periodic, edge, zero]

#####

#LIFEx script: image filtering

#####

#Patients

LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/Images/P1_PT_SUV.nii.gz

LIFEx.Patient0.Series0.Operation0=GaussianFilter,2,2,2,3d,true,reflect|Save nii

LIFEx.Patient0.Series0.Operation0.Output.Directory=E:/Project/.../Database_1/Patient_1/Images/

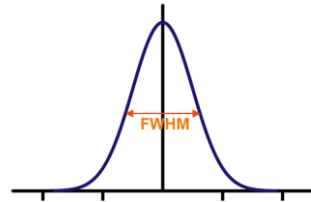
LIFEx.Patient1.Series0=E:/Project/.../Database_1/Patient_2/Images/P2_PT_SUV.nii.gz

LIFEx.Patient1.Series0.Operation0=GaussianFilter,2,2,2,3d,true,reflect|Save nii

LIFEx.Patient1.Series0.Operation0.Output.Directory=E:/Project/.../Database_1/Patient_2/Images/

other spatial filters ?
LaplacianOfGaussianFilter
LawFilter
MeanFilter
WaveletFilter

! sigma equal to FWHM/2

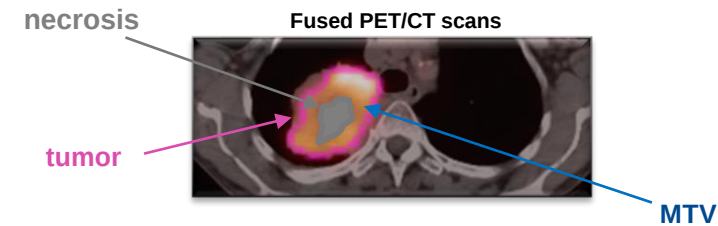


vocabulary elsewhere...

4mm Gaussian filter = Gaussian filter with 2mm sigma

Thresholding

More information can be found on the LIFEx's website
https://www.lifexsoft.org/.../Documentation/.../LIFExScripts_v7.6.0.pdf => section 4.2



in the example below

- Absolute threshold:
LIFEx.Patient0.Roi0.Operation0=**n,ValueOfMinThreshold,ValueOfMaxThreshold**
- Percent threshold:
LIFEx.Patient0.Roi0.Operation0=**n%,ValueOfPercentThreshold**
- 40 Percent threshold:
LIFEx.Patient0.Roi0.Operation0=**40%**
- 70 Percent threshold:
LIFEx.Patient0.Roi0.Operation0=**70%**
- Peak:
LIFEx.Patient0.Roi0.Operation0=**Peak**
- Nestle threshold:
LIFEx.Patient0.Roi0.Operation0=**Nestle,ValueOfThreshold**
- PERCIST threshold (need to have previously loaded a ROI named Liver)
LIFEx.Patient0.Roi0.Operation0=**PERCIST**

```
#####  
#LIFEx script: ROI thresholding  
#####
```

#Patients

```
LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/Images/P1_PT_SUV.nii.gz  
LIFEx.Patient0.Roi0=E:/Project/.../Database_1/Patient_1/Segmentations/VOIs_original  
LIFEx.Patient0.Roi0.Operation0=n,4,50|Save nii 4 < SUV < 50 CT ? => 100 < HU < 300 => soft tissue  
LIFEx.Patient0.Roi0.Operation0.Output.Directory=E:/Project/.../Database_1/Patient_1/Segmentations/VOIs_threshold
```

this folder may
contain several VOIs

```
LIFEx.Patient1.Series0=E:/Project/.../Database_1/Patient_2/Images/P2_PT_SUV.nii.gz  
LIFEx.Patient1.Roi0=E:/Project/.../Database_1/Patient_2/Segmentations/VOIs_original  
LIFEx.Patient1.Roi0.Operation0=n,4,50|Save nii  
LIFEx.Patient1.Roi0.Operation0.Output.Directory=E:/Project/.../Database_1/Patient_2/Segmentations/VOIs_threshold
```

destination folder
automatically
created with the
specified name

Extraction

Texture protocol

MTV protocol

...

Resampling

Filtering

Feature extraction

Texture protocol

MTV protocol

Color legend:
Information / Parameters
Non Discretized values
Non Discretized values
Discretized values

TEXTURE_ROI_Results.csv

INFORMATION

INFO_*

PARAMETERS

PARAMS_*

CHECK_TEXTURE_*

FEATURE RESULTS

MORPHOLOGICAL_*

INTENSITY-BASED_*

LOCAL_INTENSITY_BASED_*

INTENSITY-BASED-RIM_*

INTENSITY-HISTOGRAM_*

LOCAL_INTENSITY_HISTOGRAM_*

INTENSITY-HISTOGRAM-RIM

GLCM_*

GLRLM_*

NGTDM_*

GLSZM_*

MTV_ROI_Results.csv

MORPHOLOGICAL_*

INTENSITY-BASED_*

LOCAL_INTENSITY_BASED_*

INTENSITY-BASED-RIM_*

MTV_SUMMARY_Results.csv

SUMMARY_Bulk*

SUMMARY_Smallest*

SUMMARY_Dmax

SUMMARY_*Diff*

SUMMARY_Min*

SUMMARY_Mean*

SUMMARY_Max*

SUMMARY_TLG

SUMMARY_RoiCentroidCoor-*

SUMMARY_AllRoiCentroidCoor-*

SUMMARY_RoiWCentroidCoor-*

SUMMARY_AllRoiWCentroidCoor-*

SUMMARY_TL/TR/BL/BR*

- need to extract advanced features (textural analysis) and don't need calculating whole-body biomarkers => use Texture protocol
- need to extract advanced features and whole-body biomarkers => use both protocols
- need to extract standard features (non textural analysis) and whole-body biomarkers => use MTV protocol

Extraction • Texture protocol

More information can be found on the LIFEx's website
https://www.lifexsoft.org/.../Documentation/.../LIFExScripts_v7.6.0.pdf => section 5.1.4

```
#####  
#LIFEx script: extraction with Texture protocol  
#####
```

```
#Common  
LIFEx.guiUpdate=false  
LIFEx.seriesRoiGuiUpdate=false  
LIFEx.messagesGuiUpdate=false
```

if false...
faster calculation

```
#Result file  
LIFEx.Output.Directory=E:/Project/.../Database_1/Results_extract_Texture
```

results file
TEXTURE_ROI_Results.csv
inside the specified folder

```
#Patients  
LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/P1_PT_SUV.nii.gz  
LIFEx.Patient0.Roi0=E:/Project/.../Database_1/Patient_1/Segmentations/VOIs  
LIFEx.Patient0.Series0.Operation0=Texture,false,false,false,1,3D,Absolute,0,64,0,20  
  
LIFEx.Patient1.Series0=E:/Project/.../Database_1/Patient_2/P2_PT_SUV.nii.gz  
LIFEx.Patient1.Roi0=E:/Project/.../Database_1/Patient_2/Segmentations/VOIs  
LIFEx.Patient1.Series0.Operation0=Texture,false,false,false,1,3D,Absolute,0,64,0,20
```

template: LIFEx.Patient0.Series0.Operation0=Texture,
KeepTheLargestCluster,Check,isEnabledRoiUnion
DistanceWithNeighbours,DimensionProcessing,
Absolute,BinSize,NbGreyLevels, MinBound,MaxBound

```
example: LIFEx.Patient0.Series0.Operation0=Texture,true,false,false,1,3D,Absolute,0,64,0,20  
Texture with KeepTheLargestCluster=true  
and with check=false  
and with isEnabledRoiUnion=false  
and with DistanceWithNeighbours=1 and with DimensionProcessing=3D  
and with Absolute discretization  
and with BinSize=0  
and with NbGreyLevels=64  
and with MinBound=0  
and with MaxBound=20
```

other discretization methods ?
RelativeMinMax
RelativeMeanSd

⚠ discretization...
mandatory for
feature extraction
with Texture protocol

Extraction • MTV protocol

More information can be found on the LIFEx's website
https://www.lifexsoft.org/.../Documentation/.../LIFExScripts_v7.6.0.pdf => section 5.2.2

```
#####  
#LIFEx script: extraction with MTV protocol  
#####
```

```
#Common  
LIFEx.guiUpdate=false  
LIFEx.seriesRoiGuiUpdate=false  
LIFEx.messagesGuiUpdate=false
```

results files
MTV_ROI_Results.csv
MTV_SUMMARY_Results.csv
inside the specified folder

```
#Result file  
LIFEx.Output.Directory=E:/Project/.../Database_1/Results_extract_MTV
```

```
#Patients  
LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/P1_PT_SUV.nii.gz  
LIFEx.Patient0.Roi0=E:/Project/.../Database_1/Patient_1/Segmentations/VOIs  
LIFEx.Patient0.Series0.Operation0=MTV,false
```

```
LIFEx.Patient1.Series0=E:/Project/.../Database_1/Patient_2/P2_PT_SUV.nii.gz  
LIFEx.Patient1.Roi0=E:/Project/.../Database_1/Patient_2/Segmentations/VOIs  
LIFEx.Patient1.Series0.Operation0=MTV,false
```

Combination of operations...

For example: **Spatial resampling** + **Filtering** + **Discretization** within extraction with **Texture protocol**

...

LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/P1_PT_SUV.nii.gz

LIFEx.Patient0.Roi0=E:/Project/.../Database_1/Patient_1/Segmentations/VOIs

LIFEx.Patient0.Series0.Operation0=ResampleRescaling,2,2,2|GaussianFilter,4,4,4,3d,true,reflect|Texture,false,false,false,1,3D,Absolute,0,64,0,60

...

Combination of operations...

For example: **Spatial resampling** + **Filtering** within extraction with **MTV protocol**

...

LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/P1_PT_SUV.nii.gz

LIFEx.Patient0.Roi0=E:/Project/.../Database_1/Patient_1/Segmentations/VOIs

LIFEx.Patient0.Series0.Operation0=ResampleRescaling,2,2,2|GaussianFilter,4,4,4,3d,true,reflect|MTV,false

...

Combination of protocols...

...

LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/P1_PT_SUV.nii.gz

LIFEx.Patient0.Roi0=E:/Project/.../Database_1/Patient_1/Segmentations/VOIs

LIFEx.Patient0.Series0.Operation0=ResampleRescaling,2,2,2|MTV,false|Texture,false,false,false,1,3D,Absolute,0,64,0,60

...

...

LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/P1_CT_HU.nii.gz

LIFEx.Patient0.Series1=E:/Project/.../Database_1/Patient_1/P1_PT_SUV.nii.gz

LIFEx.Patient0.Roi0=E:/Project/.../Database_1/Patient_1/Segmentations/VOIs

LIFEx.Patient0.Series1.Operation0=ResampleRescaling,2,2,2|Texture,false,false,false,1,3D,Absolute,0,64,0,60

...

More: Opening the resulting .csv file

Enregistrement automatique

Texture_ROI_Results.csv

Rechercher

Fichier

Accueil

Insertion

Mise en page

Formules

Données

Révision

Affichage

Aide

Obtenir des données

À partir d'un fichier texte/CSV

À partir du web

À partir d'un tableau ou d'une page

Sources récentes

Connexions existantes

Récupérer et transformer des données

Actualiser tout

Requêtes et connexions

Propriétés

Modifier les liaisons

Données b...

Devises

Types de données

Trier

Filter

Effacer

Réappliquer

Avancé

Trier et filtrer

Convertir

Outils de données

Analyse de scénarios

Prévision

Grouper

Dissocier

Sous-total

Plan

Partager

Commentaires

A1

INFORMATION

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	INFORMATIC	INFO_Patient	INFO_Patient	INFO_Proces	INFO_Series	INFO_Series	INFO_Series	INFO_Actual	INFO_Name	PARAMETER	PARAMS1_Z	PARAMS2_SF	PARAMS2_SF	PARAMS2_SF	PARAMS2_SF	PARAMS2_SF	PARAMS2_SF	PARAMS2_SF	PARAMS2_SF	PARAMS2_SF	PARAMS2_SF
2	LIFEx7.6.0-SaP1_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
3	LIFEx7.6.0-SaP1_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
4	LIFEx7.6.0-SaP1_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
5	LIFEx7.6.0-SaP1_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
6	LIFEx7.6.0-SaP1_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
7	LIFEx7.6.0-SaP1_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
8	LIFEx7.6.0-SaP1_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
9	LIFEx7.6.0-SaP1_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
10	LIFEx7.6.0-SaP1_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
11	LIFEx7.6.0-SaP2_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				AddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
12	LIFEx7.6.0-SaP2_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_				AddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
13	LIFEx7.6.0-SaP2_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_#				AddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
14	LIFEx7.6.0-SaP2_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				AddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
15	LIFEx7.6.0-SaP2_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
16	LIFEx7.6.0-SaP2_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
17	LIFEx7.6.0-SaP2_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
18	LIFEx7.6.0-SaP2_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
19	LIFEx7.6.0-SaP2_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
20	LIFEx7.6.0-SaP3_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
21	LIFEx7.6.0-SaP3_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
22	LIFEx7.6.0-SaP3_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
23	LIFEx7.6.0-SaP3_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
24	LIFEx7.6.0-SaP3_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
25	LIFEx7.6.0-SaP3_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
26	LIFEx7.6.0-SaP3_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
27	LIFEx7.6.0-SaP3_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
28	LIFEx7.6.0-SaP3_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
29	LIFEx7.6.0-SaP4_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Node_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
30	LIFEx7.6.0-SaP4_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	FOIE_#1				z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed
31	LIFEx7.6.0-SaP4_PT_SUV.r		0 Sat Apr 06 15	01/01/9999	E:\Training	Resampling f0.016666667	Tumor_Abs_thres2.5to99	z2.0 y2.0 x2.(NoAddedFilt	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed	NotUsed

Texture_ROI_Results

100%

More: create a macro script

1. open the file

PT_PT_SUV.nii.gz

PT

Texture

1. Spatial Resampling

2. Spatial Filter

3. Intensity Discretization

4. Intensity Rescaling

4. set settings

1712417042631_TextureScript.txt

Fichier

Modifier

Affichage

```
## This script file is automatically generated.
## Note: lines beginning with # are comments and are not taken into account by the application.
##
## All these sections contain the series paths, ROIs and parameters needed to redo the texture analysis you've just designed in the user interface.
## You can then drag this file into the application's series/images/scripts reading area to run the whole procedure.
## You can also use this file as a starting point for modifying certain parameters in order to re-execute a new analysis under the same conditions.

# LIFEx.Output.Directory=E:/Training_LIFEx_2024/Database_2/Patient_1/Images

##
##
## [Patient0] section
##
LIFEx.Patient0.Series0=E:/Training_LIFEx_2024/Database_2/Patient_1/Images/P1_PT_SUV.nii.gz
LIFEx.Patient0.Series0.Operation=ResampleRescaling,4.0,4.0,4.0,Texture,false,false,false,1,3d,Absolute,0.3125,64.0,0.0,20.0
LIFEx.Patient0.Roi0=E:/Training_LIFEx_2024/Database_2/Patient_1/Segmentations/VOIs/Tumor_Abs_thres2.5to999.0.uint16.nii.gz
LIFEx.Patient0.Roi1=E:/Training_LIFEx_2024/Database_2/Patient_1/Segmentations/VOIs/Node_Abs_thres2.5to999.0.uint16.nii.gz
LIFEx.Patient0.Roi2=E:/Training_LIFEx_2024/Database_2/Patient_1/Segmentations/VOIs/FOIE.uint16.nii.gz
```

the VOI(s)

the VOI(s)

More: Python in automatic script creation for LIFEx

Jupyter Script_python_enter-data-script-lifex Dernière Sauvegarde : il y a quelques secondes

File Edit View Insert Cell Kernel Widgets Help

Exécuter

Automatic script creation for LIFEx

Entrée [1]:

NOTE HERE the path to the folder in which the PET scans are stored
path = 'D:/Project/Patients/'

Entrée [2]:

We scan all visible folders at the location indicated in the previous cell
import os
list_of_folders = sorted(os.listdir(path))

The result is a list:
for i,folder in enumerate(list_of_folders):
 print(i, folder, sep='\t', end='\n')

0

P_AAAA1112

1

P_AAAA1113

2

P_AAAA1114

3

P_AAAA1115

4

P_AAAA1116

5

P_AAAA1117

6

P_AAAA1118

7

P_AAAA1119

8

P_AAAA1120

9

P_AAAA1121

10

P_AAAA1122

11

P_AAAA1123

12

P_AAAA1125

13

P_AAAA1127

14

P_AAAA1128

15

P_AAAA1131

16

P_AAAA1132

17

P_AAAA1133

18

P_AAAA1134

19

P_AAAA1136

20

P_AAAA1137

21

P_AAAA1139

22

P_AAAA1140

23

P_AAAA1142

24

P_AAAA1145

25

P_AAAA1148

26

P_AAAA1149

27

P_AAAA1150

28

P_AAAA1153

29

P_AAAA1156

30

P_AAAA1161

31

P_AAAA1188

32

P_AAAA1192

33

P_AAAA1193

34

P_AAAA1194

35

P_AAAA1195

36

P_AAAA1199

37

P_AAAA1205

38

P_AAAA1206

39

P_AAAA1207

40

P_AAAA1208

41

P_AAAA1209

42

P_AAAA1210

43

P_AAAA1211

44

P_AAAA1213

45

P_AAAA1214

46

P_AAAA1215

47

P_AAAA1229

48

P_AAAA1233

49

P_AAAA1234

50

P_AAAA1253

51

P_AAAA1258

52

P_AAAA1259

Entrée [6]:

NOTE HERE the Location and name of the script to be created (or overwritten)
script_path = 'D:/Projet/script_lifex_extract.txt'

with open(script_path, 'w') as f:
 f.write("""

Common

fixed information on script
LIFEx.guiUpdate=false
LIFEx.seriesRoiGuiUpdate=false
LIFEx.messagesGuiUpdate=false

#Result file
LIFEx.Output.Directory=E:/Project/Databases_1/Results_extract_Texture

Patients / ROI
#####\n""")
 for i,folder in enumerate(list_of_folders):
 f.write('LIFEx.Patient'+str(i)+'Series0='+path+folder+'/PET_SUV.nii.gz'+'\n')
 f.write('LIFEx.Patient'+str(i)+'Roi0='+path+folder+'/Segmentations'+'\n')
 f.write('LIFEx.Patient'+str(i)+'Series0.Operation0=ResampleRescaling,2,2,2|Texture,false,false,false,1,3D,Absolute,0,192,0,60')

 f.write('\n \n')

 f.write('# End')

#LIFEx script: extraction with Texture protocol

#Common
LIFEx.guiUpdate=false
LIFEx.seriesRoiGuiUpdate=false
LIFEx.messagesGuiUpdate=false

#Result file
LIFEx.Output.Directory=E:/Project/Databases_1/Results_extract_Texture

#Patients
LIFEx.Patient0.Series0=E:/Project/.../Database_1/Patient_1/P1_PT_SUV.nii.gz
LIFEx.Patient0.Roi0=E:/Project/.../Database_1/Patient_1/Segmentations/VOIs
LIFEx.Patient0.Series0.Operation1=ResampleRescaling,2,2,2|Texture,false,false,false,1,3D,Absolute,0,192,0,60

LIFEx.Patient1.Series0=E:/Project/.../Database_1/Patient_2/P2_PT_SUV.nii.gz
LIFEx.Patient1.Roi0= E:/Project/.../Database_1/Patient_2/Segmentations/VOIs
LIFEx.Patient1.Series0.Operation1=ResampleRescaling,2,2,2|Texture,false,false,false,1,3D,Absolute,0,192,0,60

Thank you !

The templates of all introduced scripts are in the folder « Scripts_TakeHome »



Scripts_TakeHome

-  Script_lifex_1_format-conversion.txt
-  Script_lifex_2_spatial-resampling.txt
-  Script_lifex_3_filtering.txt
-  Script_lifex_4_thresholding.txt
-  Script_lifex_5_extract-Texture.txt
-  Script_lifex_6_extract-MTV.txt
-  Script_python_enter-data-script-lifex.ipynb
-  Opening the resulting csv file.pdf