

SOP-U24-...-1.0 Radiomics Assessment of DICOM/DSO Clinical
Human Research MRI Data

- A. Purpose:** To provide techniques and instructions to do radiomics assessment of the Clinical Human Research MRI data.
- B. Scope:** The procedure described here can be used to process all DICOMs and lesion region of interest DSOs to generate radiomics assessment.

C. Definitions:

DICOM: The international standard to transmit, store, retrieve, print, process, and display medical imaging information

DSO: DICOM Segmentation Object is a DICOM object that contains a map for the lesion region of interest

ADC: Apparent diffusion coefficient

SER: Statistical parametric mapping

D. Tools:

Pyradiomics: An open-source python package for the extraction of Radiomics features from medical imaging

ePAD: An open-source quantitative imaging informatics platform

E. References:

Pyradiomics (<https://pyradiomics.readthedocs.io/en/latest/>)

ePAD (<https://epad.stanford.edu/>)

SOP-UTNATMRI-5 Parametric Mapping of DICOM Clinical Human Research MRI Data

F. Procedures:

General Considerations:

- Pyradiomics should be run on both ADC and SER parametric maps for both pre and post study

Special considerations for each pathological type of tissue specimen:

- Plugin parameter prefix should be set to *ser* for SER parametric maps
- Plugin parameter prefix should be set to *adc* for ADC parametric maps

1. Upload the patient MRI DICOMs

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Description/Name	# of aims	# of sub	# of images	Type	Creation date	Upload date	Accession	Identifier
TEST_01	6	2		MR/SEG		2021-07-27		TEST_01
TEST_02	6	2		MR/SEG		2021-07-27		TEST_02
TEST_04	6	2		MR/SEG		2021-07-27		TEST_04
TEST_07	6	2		MR/SEG		2021-07-27		TEST_07
TEST_09	6	2		MR/SEG		2021-07-27		TEST_09
TEST_10	6	2		MR/SEG		2021-07-27		TEST_10

Description/Name	# of aims	# of sub	# of images	Type	Creation date	Upload date	Accession	Identifier
TEST_01	6	2		MR/SEG		2021-07-27		TEST_01
U24 Clinical Data Testing v1	3	3	30	MR/SEG	2017-04-26	2021-07-27	1.3.6.1.2.1107.5.2.19.45380.30000017042617370052600000106	
ADC (um^2/ms)	1		10	MR			1.3.6.1.4.1.9590.100.1.2.103628167115495307030858737072220479424	
SER	1		10	MR			1.3.6.1.4.1.9590.100.1.2.26082195280048177622724185288059555040	
HRT1w	1		10	MR			1.3.6.1.4.1.9590.100.1.2.97257869738191087428204702502230046773	
U24 Clinical Data Testing v2	3	3	30	MR/SEG	2017-06-07	2021-07-27	1.2.840.114257.15.19.5232017.1728.82829.800	
ADC (um^2/ms)	1		10	MR			1.3.6.1.4.1.9590.100.1.2.17825138092506918823136557660030261967	
HRT1w	1		10	MR			1.3.6.1.4.1.9590.100.1.2.32722842552122364173017854958418722460	
SER	1		10	MR			1.3.6.1.4.1.9590.100.1.2.38807669393465572812946098071237000963	

2. Update the pyradiomics plugin prefix to *ser* for run SER

Description/Name	# of aims	# of sub	# of images	Type	Creation date	Upload date	Accession	Identifier
TEST_01	6	2		MR/SEG		2021-07-27		TEST_01

- Users
- Annotations
- Templates
- Plugins**
- Worklists
- Scan Data Folder

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Plugins

manage add process track process

	Name	Aim Required	Image	Parameters	Projects	Description	Enabled
<input type="checkbox"/>	<i>pyradiomics</i>	multiple	qifp/pyradiomics_slicer:latest		<i>lite</i>		<input checked="" type="checkbox"/>

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Plugins

manage ad Parameters

	id	Name	refresh...	send p...	send n...	upload...	upload...	format	prefix
<input type="checkbox"/>	parameters		no	yes	no	no	no	Parameters	
<input type="checkbox"/>	parameters	pyradiomicsprefix	no	no	yes	no	no	Parameters	
<input type="checkbox"/>	output		no	yes	no	no	no	OutputFile	

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add parameter Close

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Parameters

add new parameter

type*

parameters ▼

Send parameter to docker

Name

pyradiomicsprefix

Send name as parameter

format*

parameters ▼

prefix

input binding

Default value

ser

Description

*Required

save Close

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3. Add SER annotations to run the plugin

The screenshot shows a 'Plugins' window with a table of annotations. The table has columns for 'patient name' and 'name'. The 'TEST_01SER__tumor segmentation' entries are checked.

	patient name	name
<input type="checkbox"/>	TEST_01	TEST_01HRT1w_tumor segmentation
<input type="checkbox"/>	TEST_01	TEST_01HRT1w_tumor segmentation
<input checked="" type="checkbox"/>	TEST_01	TEST_01SER__tumor segmentation
<input checked="" type="checkbox"/>	TEST_01	TEST_01SER__tumor segmentation
<input type="checkbox"/>	TEST_01	TEST_01ADC__tumor segmentation
<input type="checkbox"/>	TEST_01	TEST_01ADC__tumor segmentation
<input type="checkbox"/>	TEST_02	TEST_02HRT1w_tumor segmentation
<input type="checkbox"/>	TEST_02	TEST_02HRT1w_tumor segmentation
<input type="checkbox"/>	TEST_02	TEST_02SER__tumor segmentation
<input type="checkbox"/>	TEST_02	TEST_02ADC__tumor segmentation

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4. Start pyradiomics plugin

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container	plugin	aims	project	param type	status	starttime	endtime
epadplugin_12	pyradiomics	u24utbs_BlankSI u24utbs_BlankSI	lite	default	- ended	Wed Sep 01 2021 - 19:4:56	Wed Sep 01 2021 - 19:5:40
epadplugin_13	pyradiomics	u24utbs_Blankve u24utbs_Blankve	lite	default	- ended	Wed Sep 01 2021 - 19:19:25	Wed Sep 01 2021 - 19:19:59
epadplugin_14	pyradiomics	u24utbs_Blankve u24utbs_Blankve	lite	default	- ended	Mon Sep 13 2021 - 16:2:13	Mon Sep 13 2021 - 16:6:27
epadplugin_15	pyradiomics	u24utbs_BlankSI u24utbs_BlankSI	lite	default	- ended	Wed Sep 08 2021 - 19:16:50	Wed Sep 08 2021 - 19:17:25
epadplugin_16	pyradiomics	u24utbs_BlankSI u24utbs_BlankSI	lite	default	- ended	Mon Sep 13 2021 - 15:51:8	Mon Sep 13 2021 - 15:55:18
epadplugin_17	pyradiomics	Peripancreatic LI	lite	default	- ended	Mon Sep 13 2021 - 18:20:44	Mon Sep 13 2021 - 18:25:50
epadplugin_18	pyradiomics	TEST_01SER__tu TEST_01SER__tu	lite	default	- added	-	-

Start plugin

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5. Set the pyradiomics prefix to adc for ADC parametric map analysis

Parameters

add new parameter

type*
parameters

Send parameter to docker

Name
pyradiomicsprefix

Send name as parameter

format*
parameters

prefix
adc

input binding

Default value
adc

Description

*Required

save Close

6. Add ADC annotations to plugin processing

Plugins ✕

manage **add process** track process

projects: **lite** ▾ plugins: **pyradiomics** ▾ parameter type: **default** ▾ **add selected**

Annotations

<input type="checkbox"/>	patient name	name
<input type="checkbox"/>	TEST_01	TEST_01HRT1w_tumor segmentation
<input type="checkbox"/>	TEST_01	TEST_01HRT1w_tumor segmentation
<input type="checkbox"/>	TEST_01	TEST_01SER__tumor segmentation
<input type="checkbox"/>	TEST_01	TEST_01SER__tumor segmentation
<input checked="" type="checkbox"/>	TEST_01	TEST_01ADC__tumor segmentation
<input checked="" type="checkbox"/>	TEST_01	TEST_01ADC__tumor segmentation
<input type="checkbox"/>	TEST_02	TEST_02HRT1w_tumor segmentation
<input type="checkbox"/>	TEST_02	TEST_02HRT1w_tumor segmentation
<input type="checkbox"/>	TEST_02	TEST_02SER__tumor segmentation
<input type="checkbox"/>	TEST_02	TEST_02ADC__tumor segmentation

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7. Run pyradiomics on ADC series

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container	plugin	aims	project	param type	status	starttime	endtime
epadplugin_12	pyradiomics	u24utbs_BlankSi u24utbs_BlankSi	lite	default	- ended	Wed Sep 01 2021 - 19:4:56	Wed Sep 01 2021 - 19:5:40
epadplugin_13	pyradiomics	u24utbs_Blankve u24utbs_Blankve	lite	default	- ended	Wed Sep 01 2021 - 19:19:25	Wed Sep 01 2021 - 19:19:59
epadplugin_14	pyradiomics	u24utbs_Blankve u24utbs_Blankve	lite	default	- ended	Mon Sep 13 2021 - 16:2:13	Mon Sep 13 2021 - 16:6:27
epadplugin_15	pyradiomics	u24utbs_BlankSi u24utbs_BlankSi	lite	default	- ended	Wed Sep 08 2021 - 19:16:50	Wed Sep 08 2021 - 19:17:25
epadplugin_16	pyradiomics	u24utbs_BlankSi u24utbs_BlankSi	lite	default	- ended	Mon Sep 13 2021 - 15:51:8	Mon Sep 13 2021 - 15:55:18
epadplugin_17	pyradiomics	Peripancreatic LT	lite	default	- ended	Mon Sep 13 2021 - 18:20:44	Mon Sep 13 2021 - 18:25:50
epadplugin_18	pyradiomics	TEST_01SER__tu TEST_01SER__tu	lite	default	- added	-	-
epadplugin_19	pyradiomics	TEST_01ADC__t TEST_01ADC__t	lite	default	- added	-	-

Start plugin

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G. Revisions log:

Version	Revision Date	Section Revised	Notes
1	9.15.2021	All	SOP created

H. Appendix: