Demonstration of copying of a contour or segmentation from an image to another for different Use Cases

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Overview of Use Cases and Datasets used

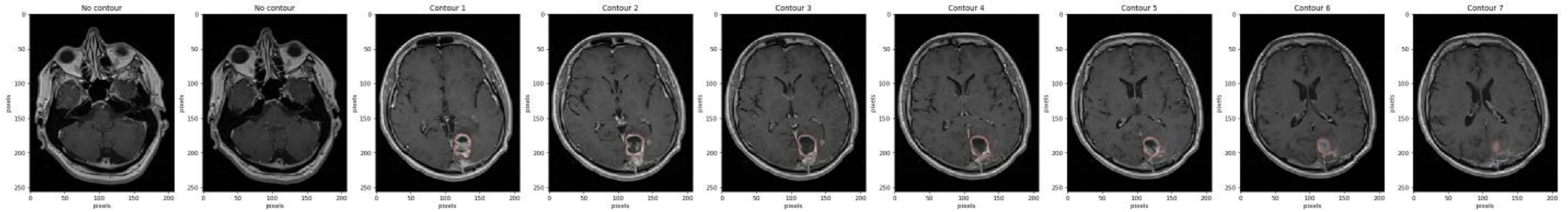
Use Case	Copy type	Copy from	Copy to
1	Direct	Slice 23 in Dataset 1 (MR4 S9) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)	Slice 29 in Dataset 1 (MR4 S9) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)
2a	Direct	Slice 23 in Dataset 1 (MR4 S9) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)	Slice 22 in Dataset 2 (MR4 S5) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)
2b*	RP	Slice 27 in Dataset 1 (MR4 S9) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)	Dataset 2 (MR4 S5) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)
3a-i	Direct	Slice 25 in Dataset 1 (MR4 S9) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)	Slice 20 in Dataset 3 (MR4 S3) (VS = 0.51, 0.51, 7.5 mm, ST = 5 mm)
3b-i*	RP	Slice 25 in Dataset 1 (MR4 S9) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)	Dataset 3 (MR4 S3) (VS = 0.51, 0.51, 7.5 mm, ST = 5 mm)
3a-ii	Direct	Slice 11 in Dataset 3 (MR4 S3) (VS = 0.51, 0.51, 7.5 mm, ST = 5 mm)	Slice 26 in Dataset 1 (MR4 S9) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)
3b-ii	RP	Slice 10 or 11 in Dataset 3 (MR4 S3) (VS = 0.51, 0.51, 7.5 mm, ST = 5 mm)	Dataset 1 (MR4 S9) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)
5	RP	Slice 23 in Dataset 1 (MR4 S9) (VS = 0.90, 0.90, 3 mm, ST = 3 mm)	Dataset 4 (MR12 S8) (VS = 0.94, 0.94, 5 mm, ST = 5 mm)

* No segmentations appear in the OHIF-Viewer

Results of copying a contour

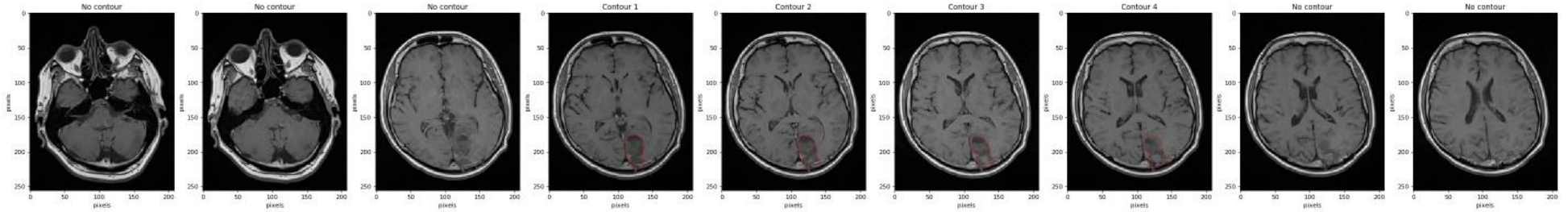
Dataset 1

Study = MR_4
Series = 9
IS = (208, 256, 50) pixels
VS = (0.90, 0.90, 3.0) mm
ST = 3.0 mm
Origin = (-103.3, -153.4, -10.3) mm
IOP = (1.00, 0.00, 0.07, -0.02, 0.95, 0.30)



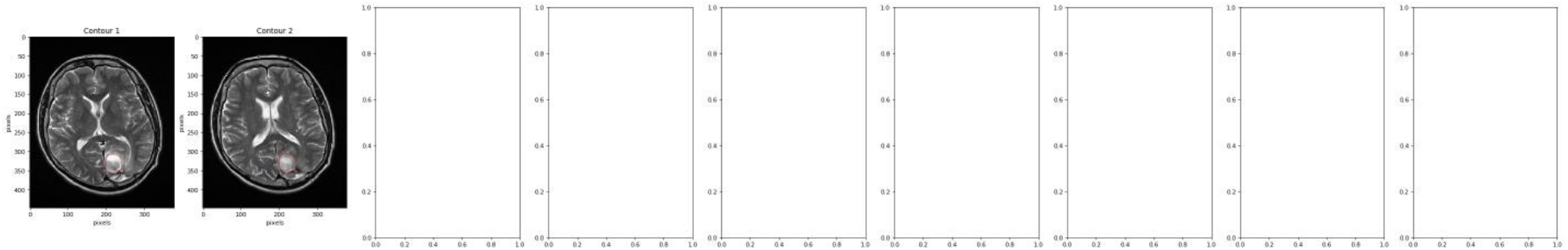
Dataset 2

Study = MR_4
Series = 5
IS = (208, 256, 50) pixels
VS = (0.90, 0.90, 3.0) mm
ST = 3.0 mm
Origin = (-106.9, -153.2, -11.5) mm
IOP = (1.00, 0.00, 0.07, -0.02, 0.95, 0.30)



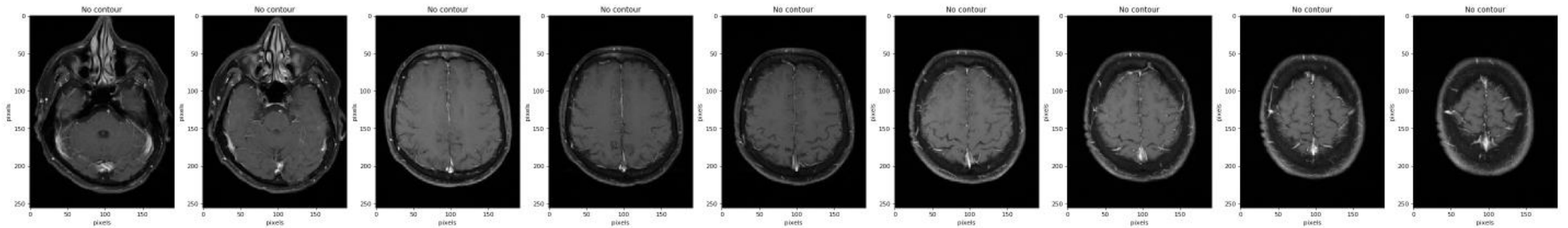
Dataset 3

Study = MR_4
Series = 3
IS = (378, 448, 21) pixels
VS = (0.51, 0.51, 7.5) mm
ST = 5.0 mm
Origin = (-106.9, -153.2, -11.5) mm
IOP = (1.00, 0.00, 0.07, -0.02, 0.95, 0.30)



Dataset 4

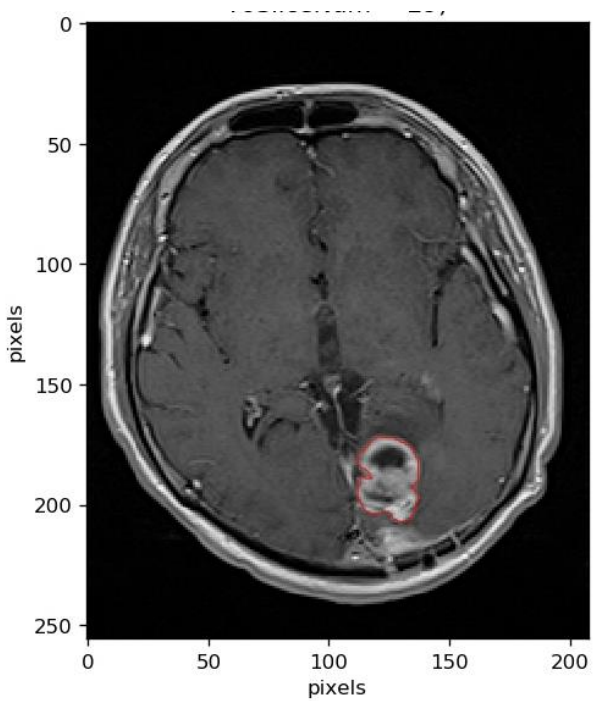
Study = MR_12
Series = 8
IS = (192, 256, 35) pixels
VS = (0.94, 0.94, 5.0) mm
ST = 5.0 mm
Origin = (-115.1, -124.8, -10.8) mm
IOP = (1.00, 0.11, 0.07, -0.10, 0.99, -0.03)



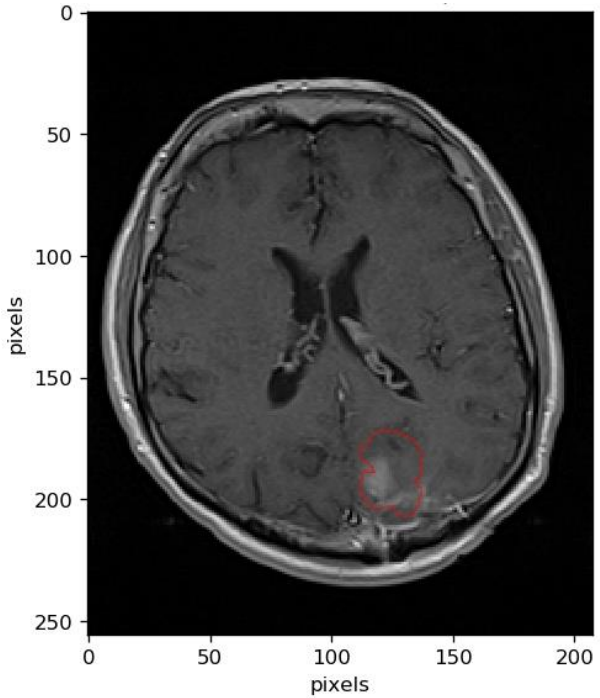
Slice number	11	12	24	25	26	27	28	29	30

Case 1 – Direct copy of a contour on a slice in Dataset 1 to a different slice in the same image

Python
(0-indexed)



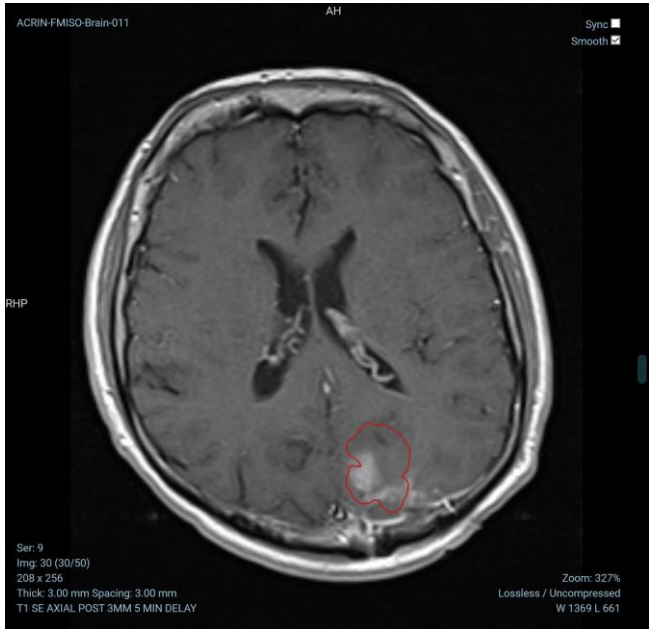
Slice 23



Slice 29

Contour from slice 23 copied to slice 29.

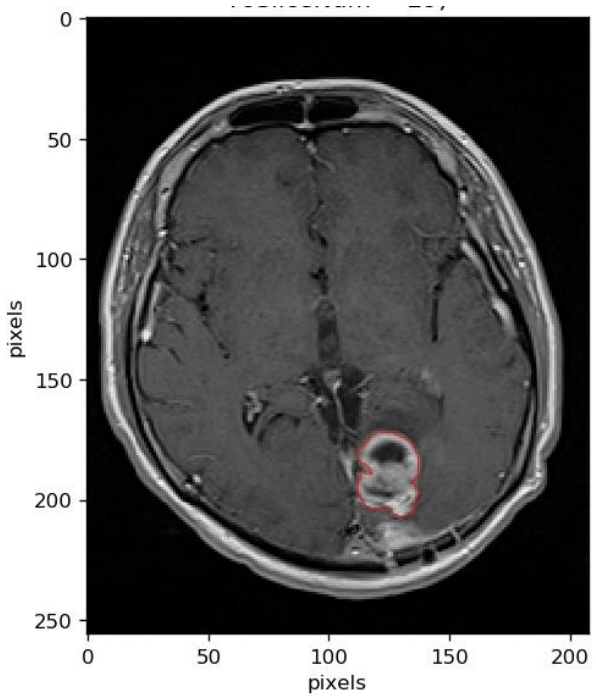
OHIF viewer
(1-indexed)



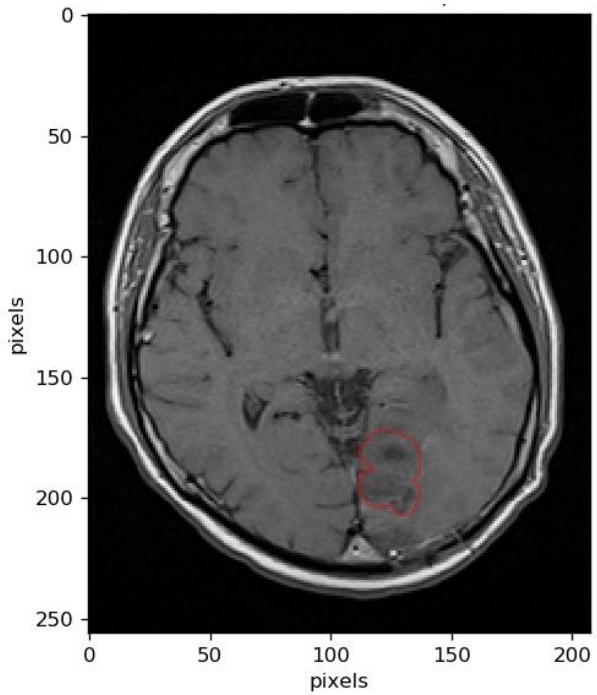
Contour from slice 24 copied to slice 30.

Case 2a – Direct copy of a contour on a slice in Dataset 1 to a slice in a different image with the same resolution (Dataset 2)

Python
(0-indexed)



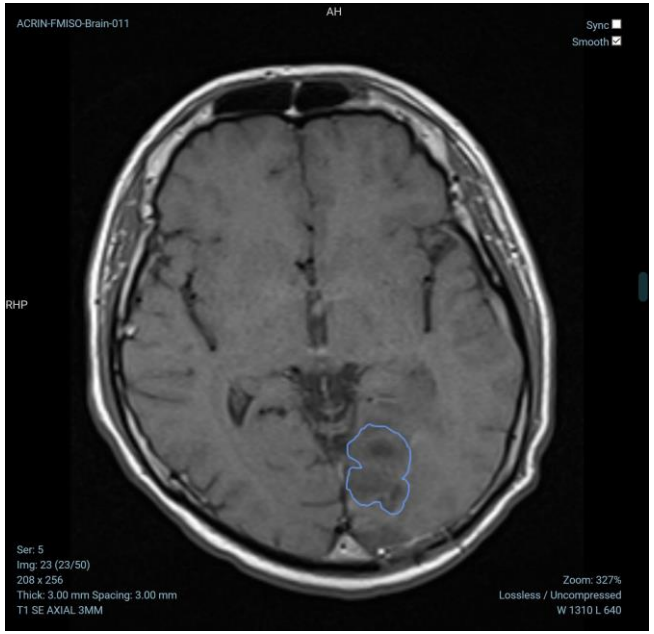
Slice 23



Slice 22

Contour from slice 23 copied to slice 22.

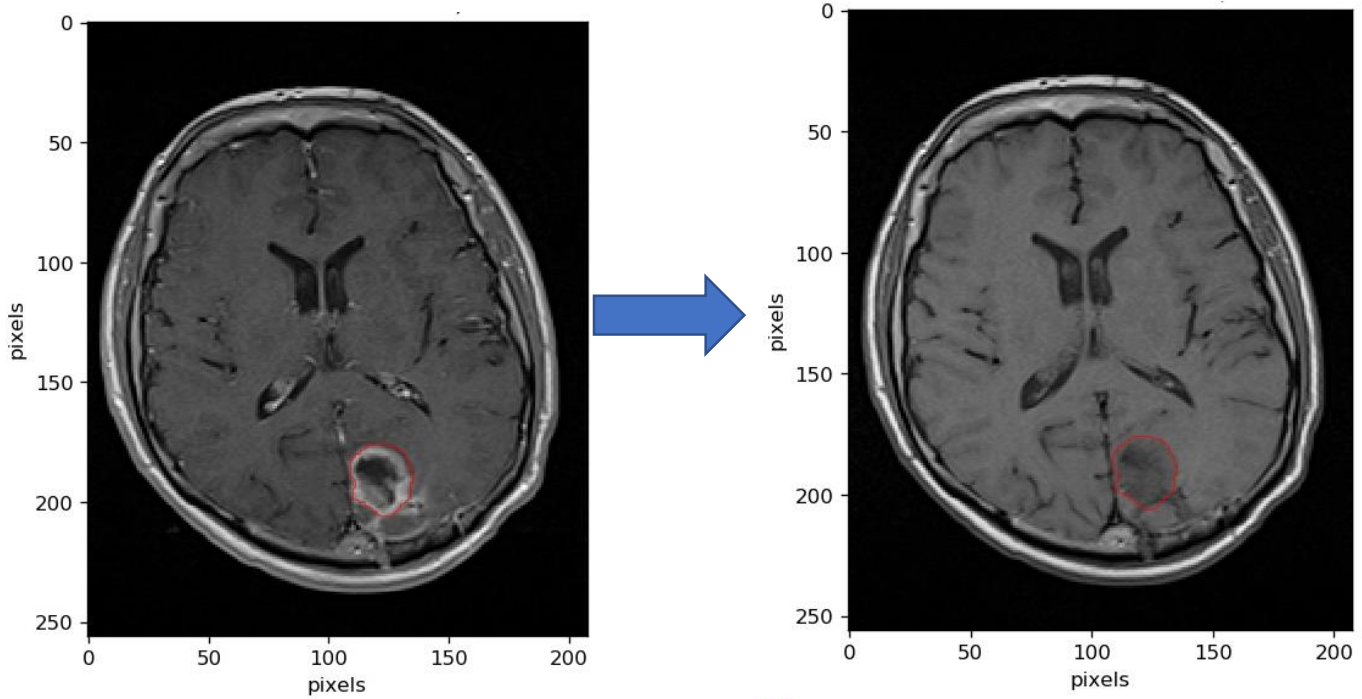
OHIF viewer
(1-indexed)



Contour from slice 24 copied to slice 23.

Case 2b – Relationship-preserving copy of a contour on a slice in Dataset 1 to a slice in a different image with the same resolution (Dataset 2)

Python
(0-indexed)

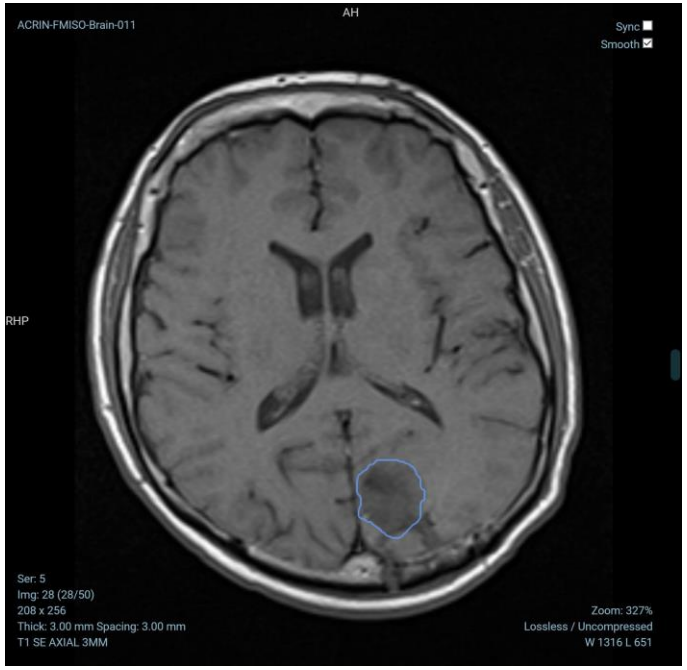


Slice 27

Slice 27

Contour from slice 27 copied to slice 27.

OHIF viewer
(1-indexed)

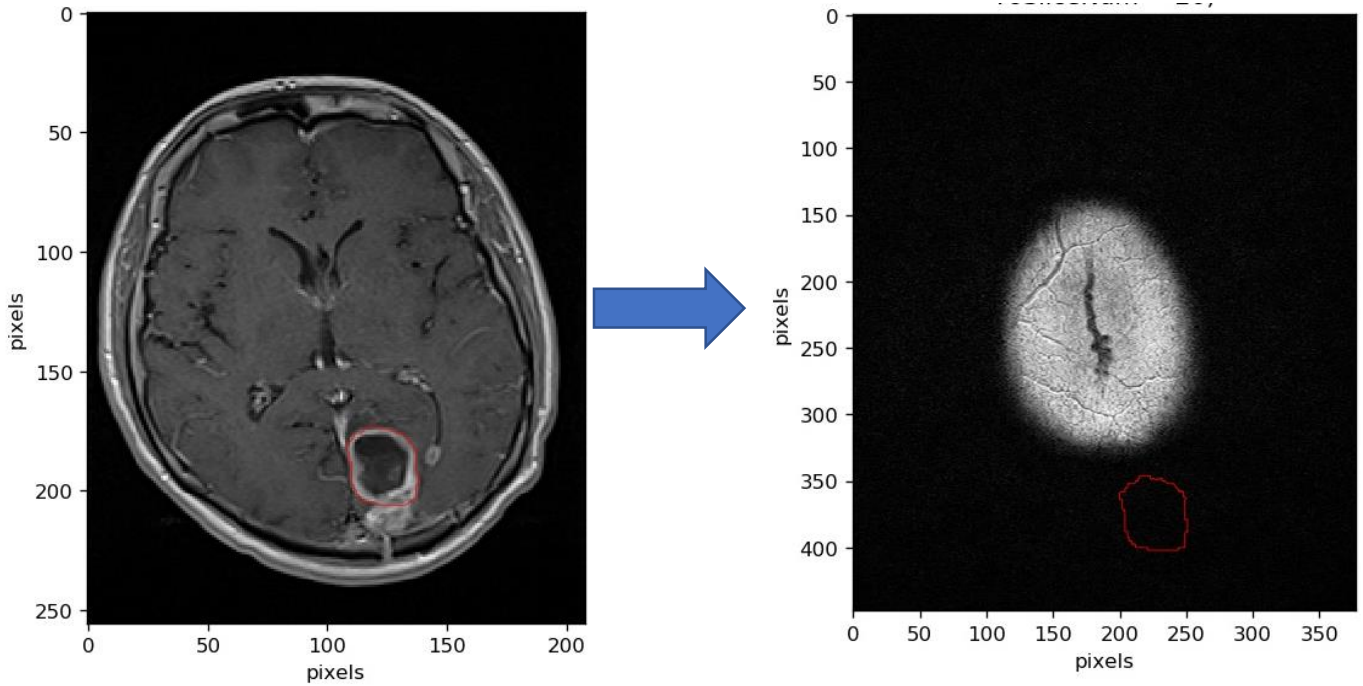


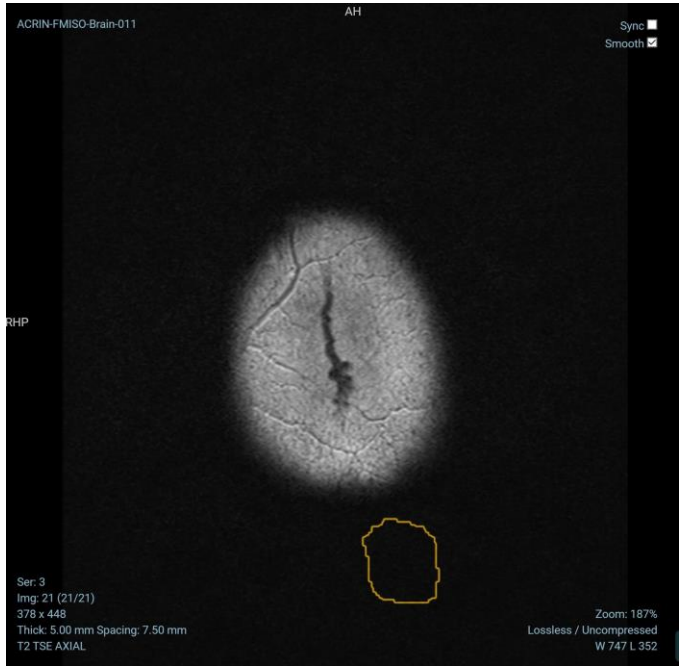
Contour from slice 28 copied to slice 28.

Case 3a – Direct copy of a contour from a slice in Dataset 1 to a slice on a different image with a different resolution (Dataset 3): Sub-case i – thin-to-thick slice thickness

Python
(0-indexed)

OHIF viewer
(1-indexed)





Slice 25

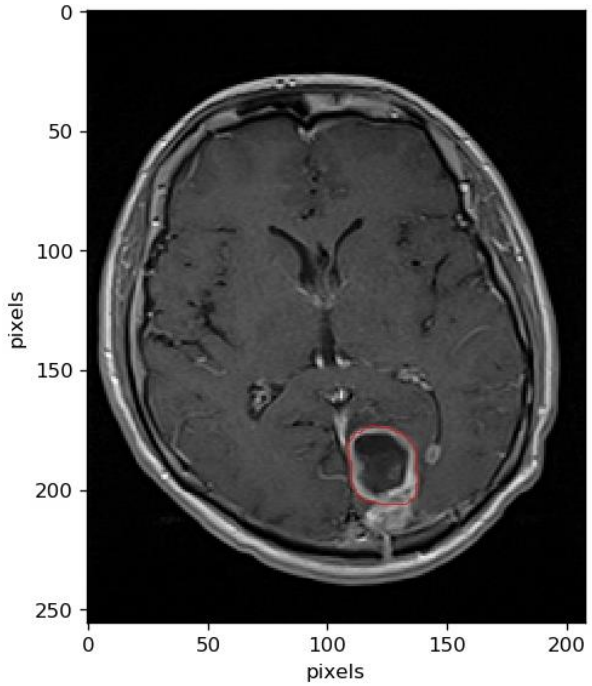
Slice 20

Contour from slice 25 copied to slice 20.

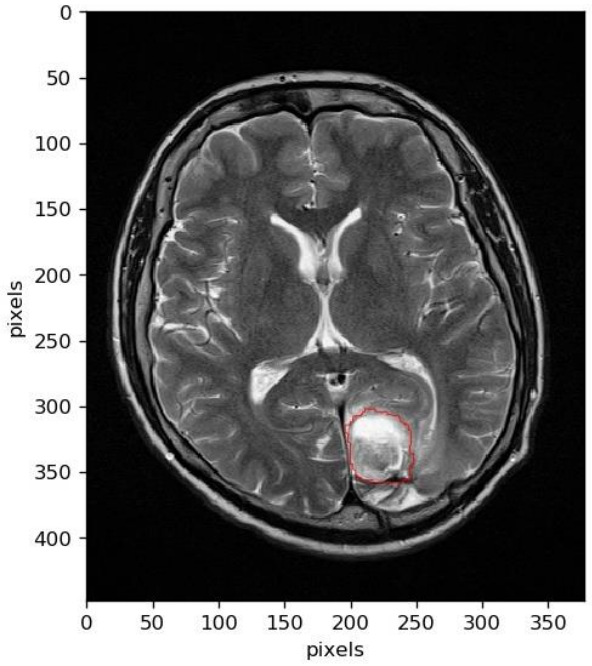
Contour from slice 26 copied to slice 21.

Case 3b – Relationship-preserving copy of a contour from a slice in Dataset 1 to a slice on a different image with a different resolution (Dataset 3): Sub-case i – thin-to-thick slice thickness

Python
(0-indexed)



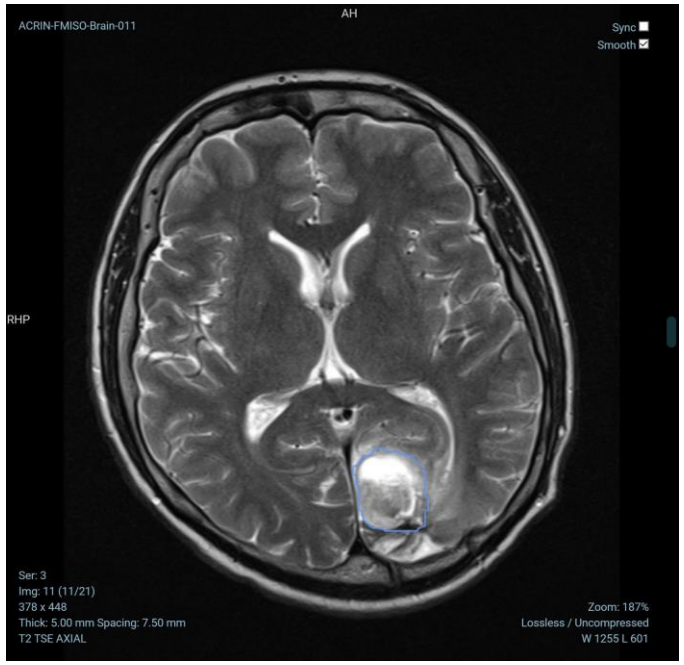
Slice 25



Slice 10

Contour from slice 25 copied to slice 10.

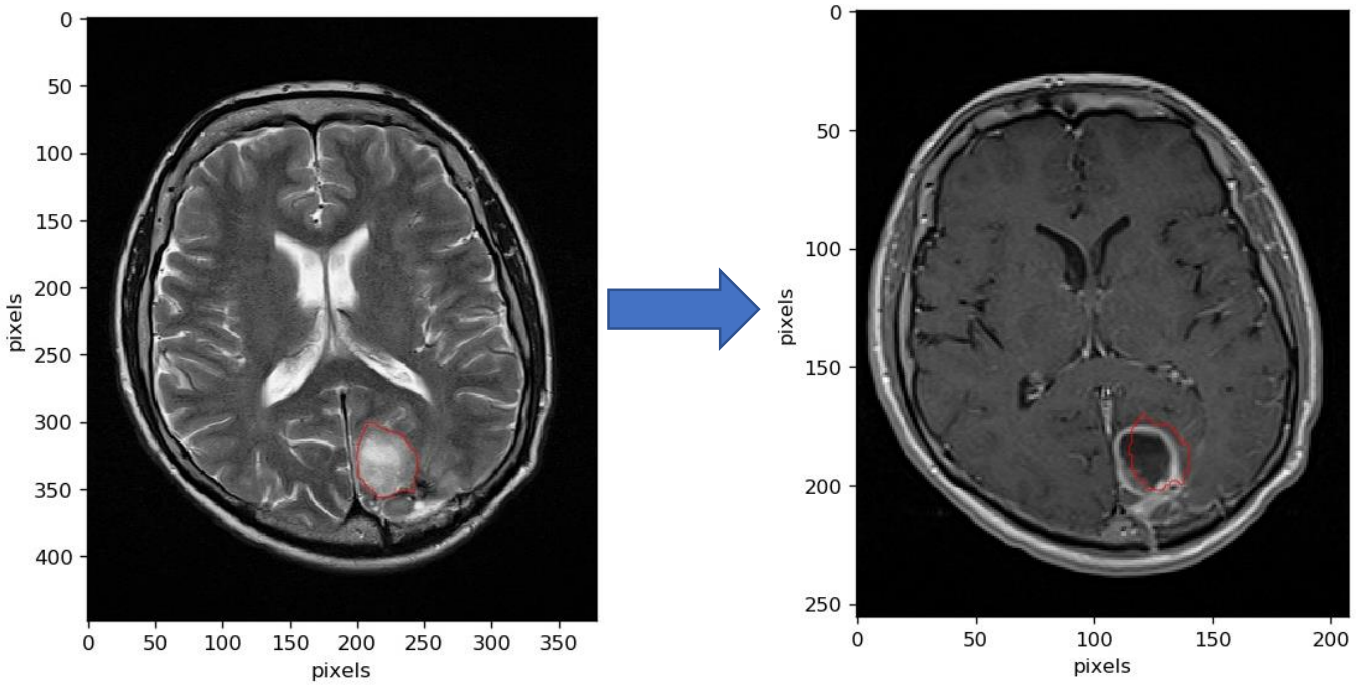
OHIF viewer
(1-indexed)



Contour from slice 26 copied to slice 11.

Case 3a – Direct copy of a contour from a slice in Dataset 3 to a slice on a different image with a different resolution (Dataset 1): Sub-case ii – thick-to-thin slice thickness

Python
(0-indexed)



Slice 11

Slice 26

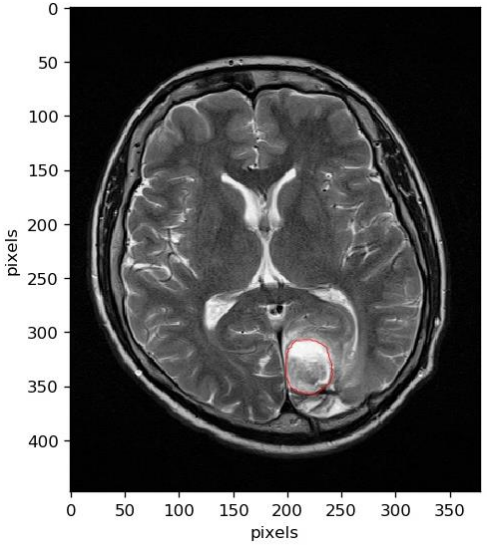
Contour from slice 11 copied to slice 26.

OHIF viewer
(1-indexed)

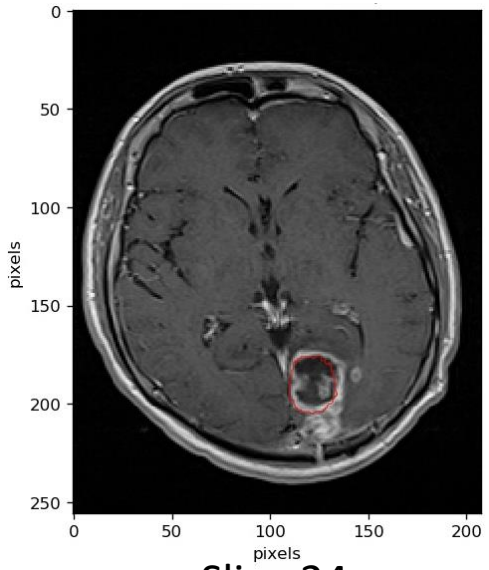
Contour from slice 12 copied to slice 27.

Case 3b – Relationship-preserving copy of a contour from a slice in Dataset 3 to a slice on a different image with a different resolution (Dataset 1): Sub-case ii – thick-to-thin slice thickness

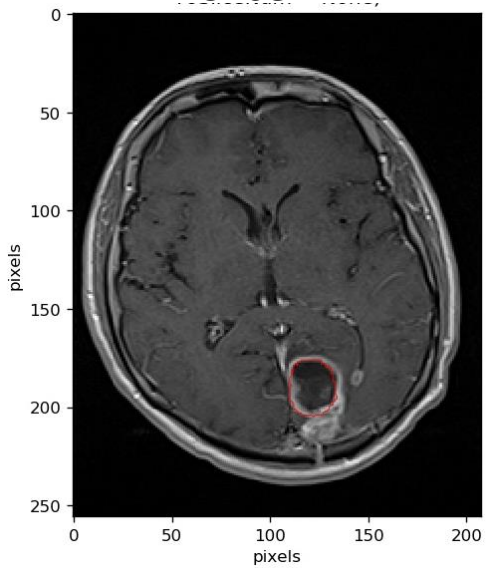
Python
(0-indexed)



Slice 10



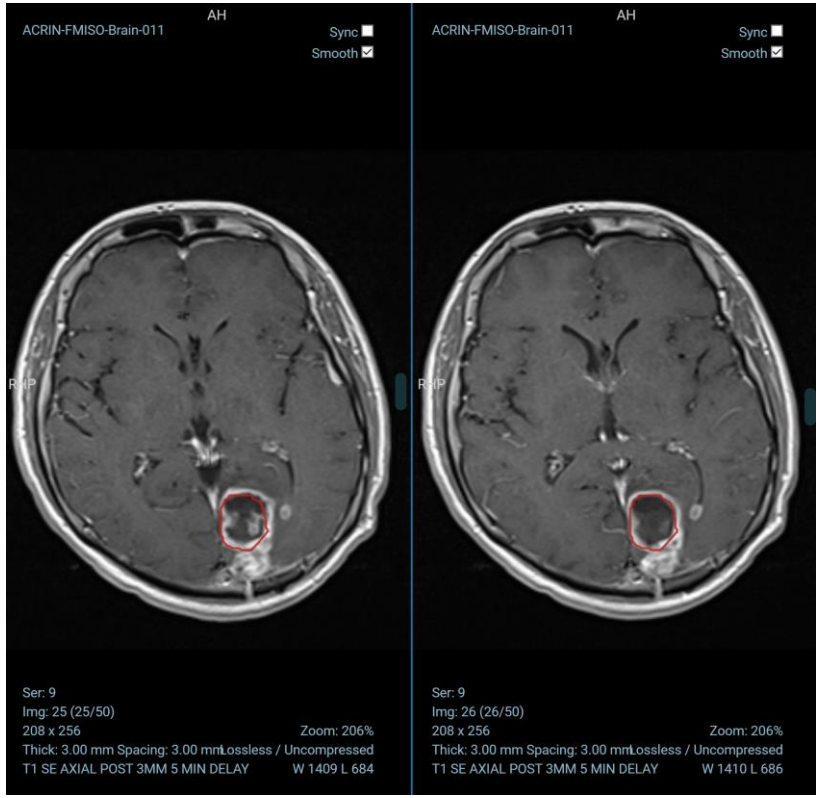
Slice 24



Slice 25

Contour from slice 10
copied to slices 24 & 25.

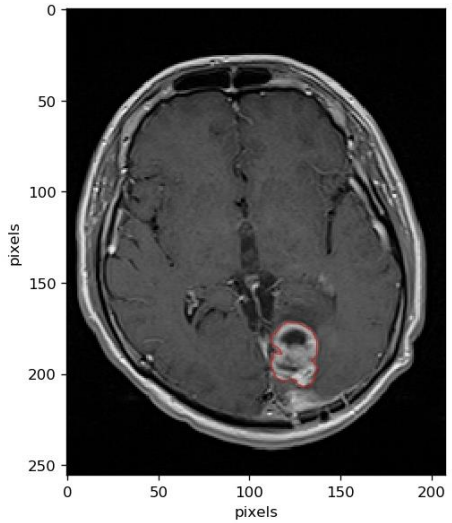
OHIF viewer
(1-indexed)



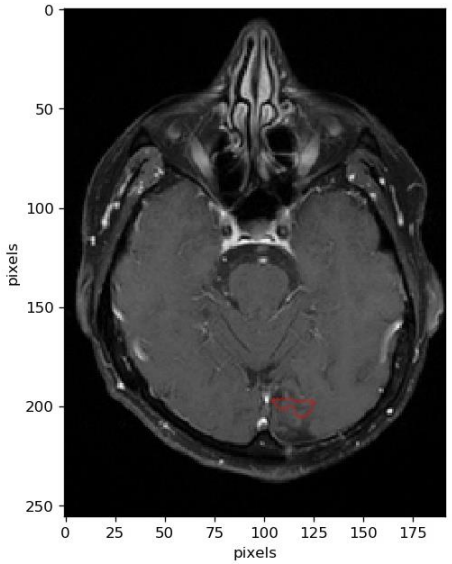
Contour from slice 10 copied to slices 25 & 26.

Case 5 – Relationship-preserving copy of a contour from a slice in Dataset 1 to a slice on a different image with a different FrameOfReferenceUID, ImageOrientationPatient, resolution (Dataset 4)

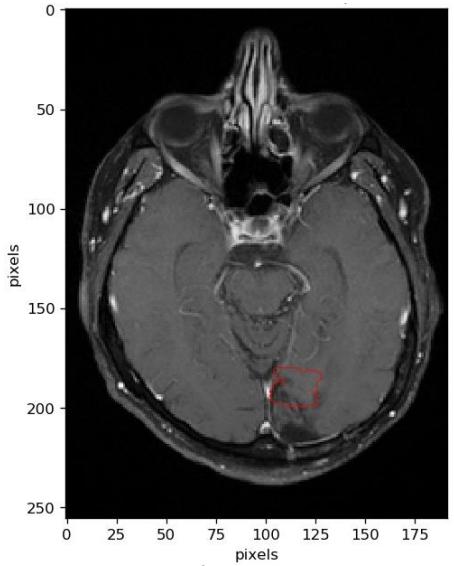
Python
(0-indexed)



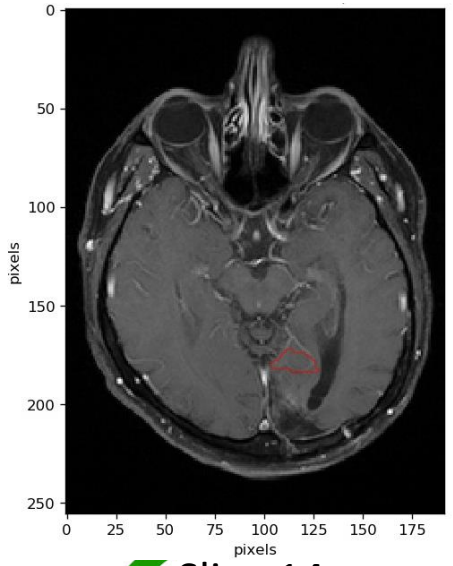
Slice 23



Slice 12



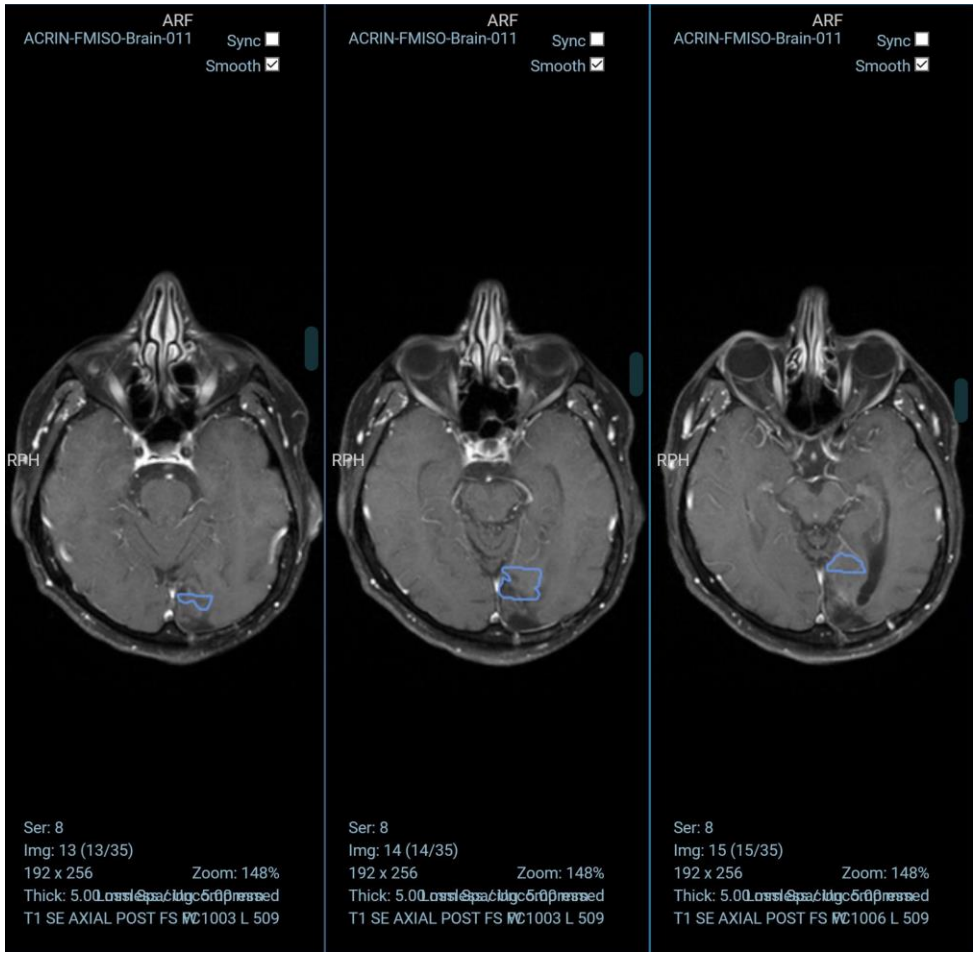
Slice 13



Slice 14

Contour from slice 23 copied to slices 12, 13 & 14.

OHIF viewer
(1-indexed)

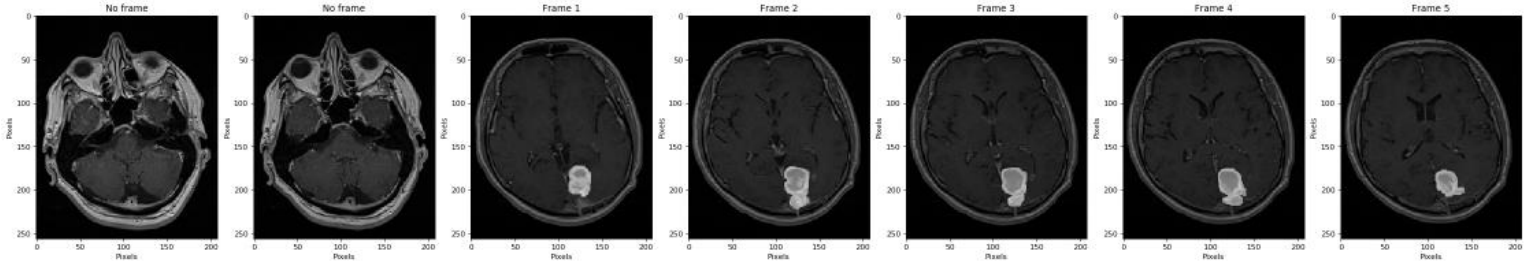


Contour from slice 10 copied to slices 13, 14 & 15.

Results of copying a segmentation

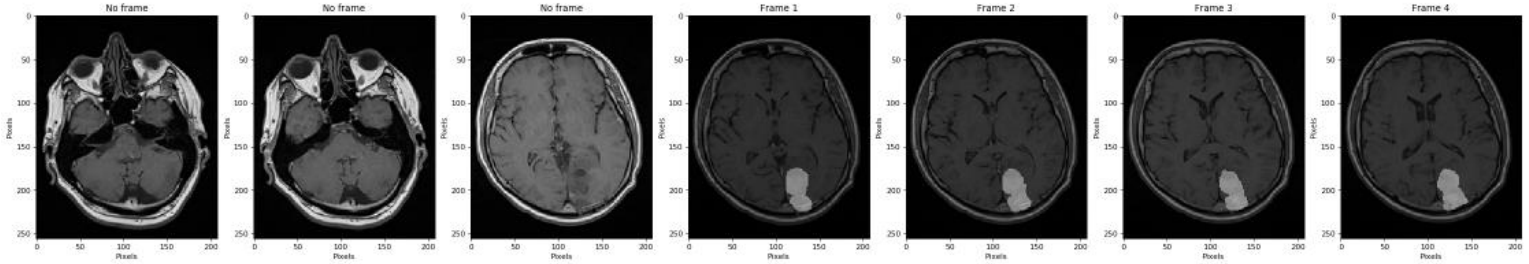
Dataset 1

Study = MR_4
Series = 9
IS = (208, 256, 50) pixels
VS = (0.90, 0.90, 3.0) mm
ST = 3.0 mm
Origin = (-103.3, -153.4, -10.3) mm
IOP = (1.00, 0.00, 0.07, -0.02, 0.95, 0.30)



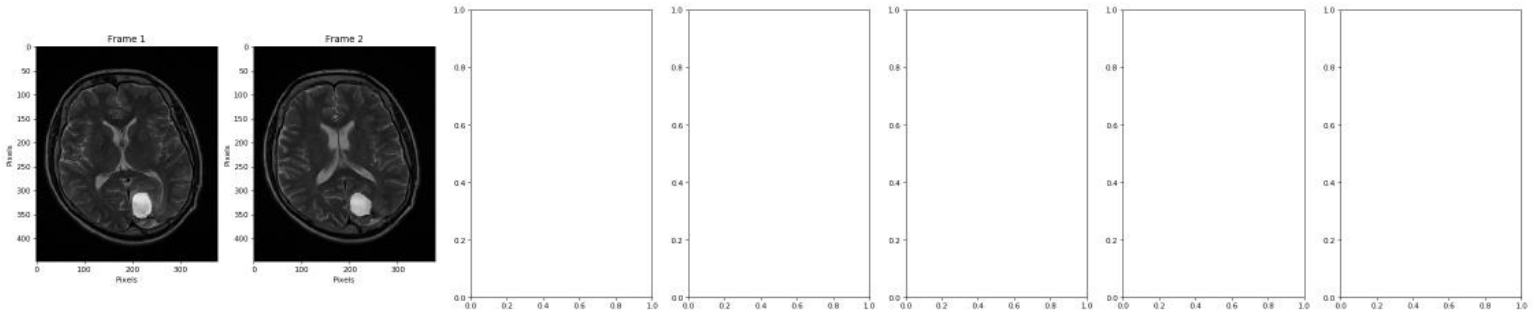
Dataset 2

Study = MR_4
Series = 5
IS = (208, 256, 50) pixels
VS = (0.90, 0.90, 3.0) mm
ST = 3.0 mm
Origin = (-106.9, -153.2, -11.5) mm
IOP = (1.00, 0.00, 0.07, -0.02, 0.95, 0.30)



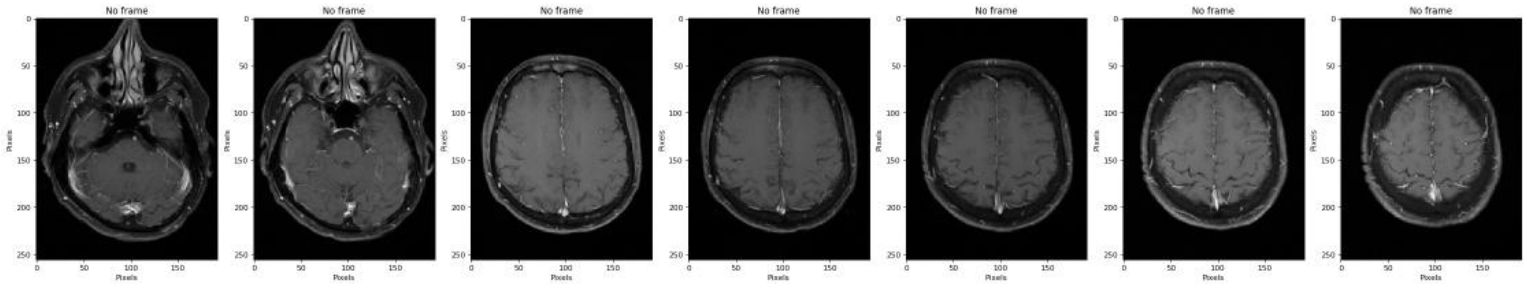
Dataset 3

Study = MR_4
Series = 3
IS = (378, 448, 21) pixels
VS = (0.51, 0.51, 7.5) mm
ST = 5.0 mm
Origin = (-106.9, -153.2, -11.5) mm
IOP = (1.00, 0.00, 0.07, -0.02, 0.95, 0.30)



Dataset 4

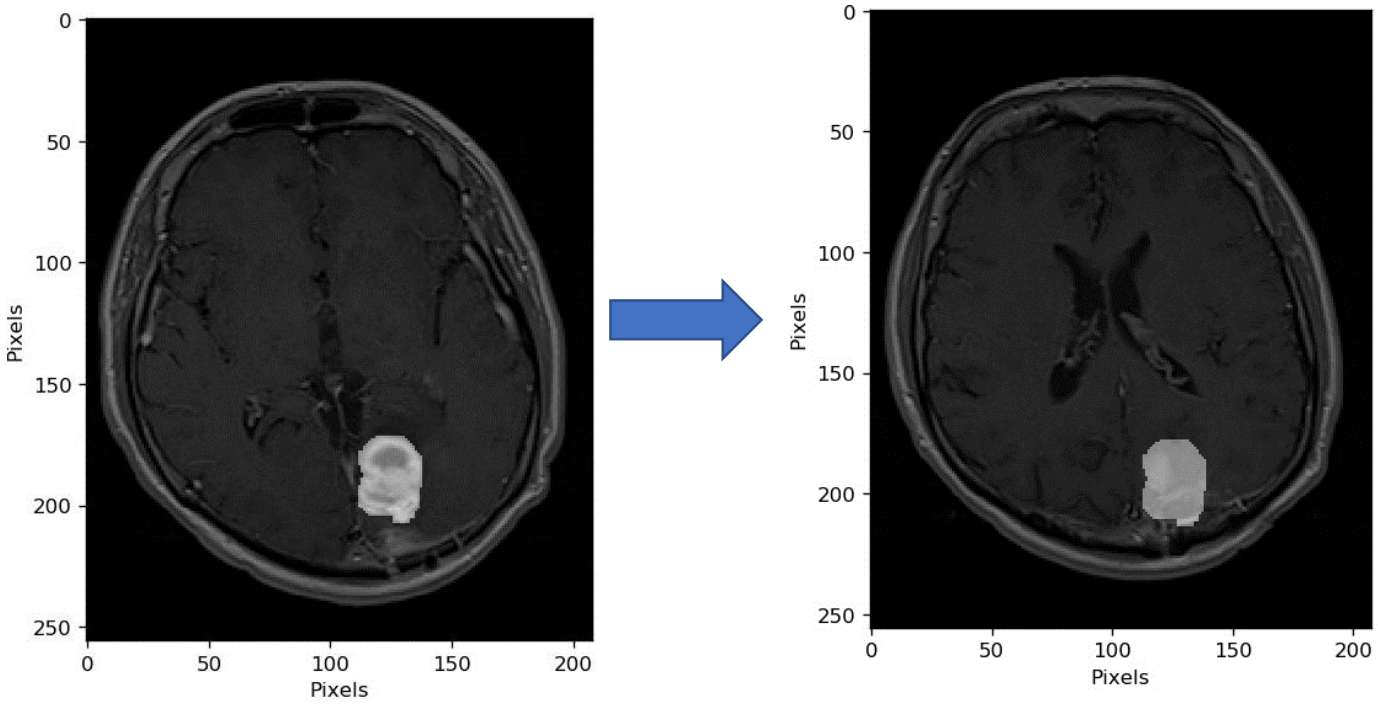
Study = MR_12
Series = 8
IS = (192, 256, 35) pixels
VS = (0.94, 0.94, 5.0) mm
ST = 5.0 mm
Origin = (-115.1, -124.8, -10.8) mm
IOP = (1.00, 0.11, 0.07, -0.10, 0.99, -0.03)



Slice number	11	12	24	25	26	27	28

Case 1 – Direct copy of a segmentation on a slice in Dataset 1 to a different slice in the same image

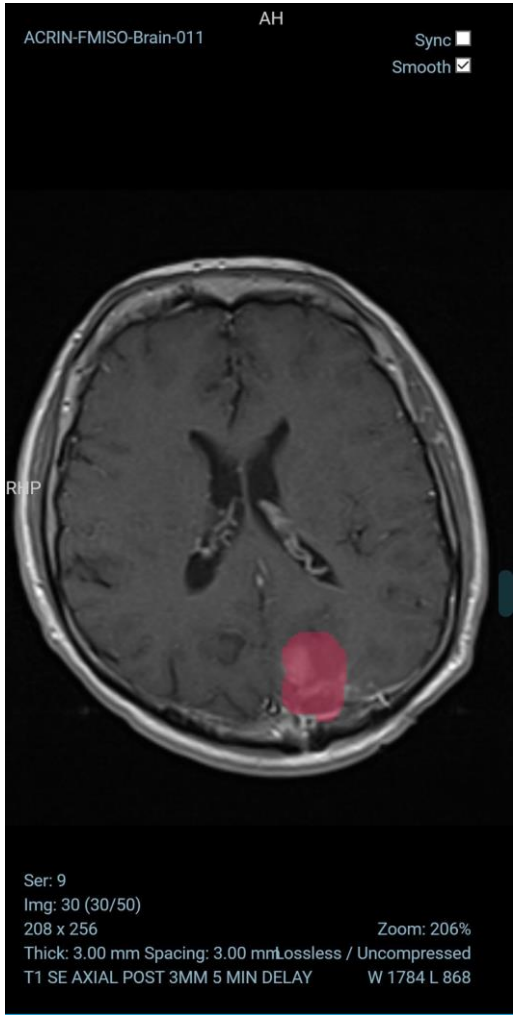
Python
(0-indexed)



Slice 23

Slice 29

OHIF viewer (1-indexed)

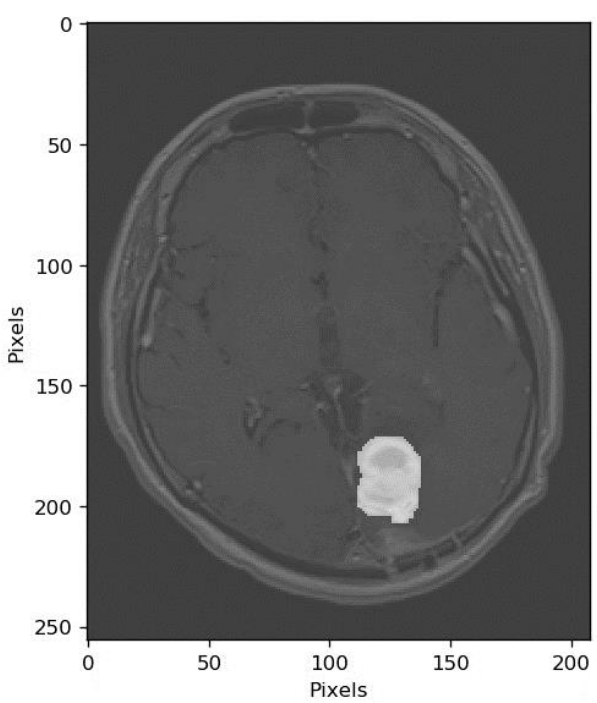


Segmentation from slice 23 copied to slice 29.

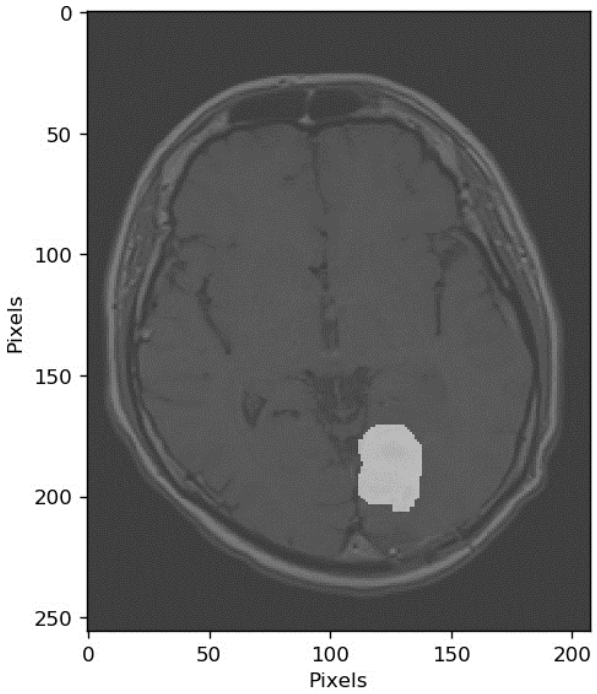
Segmentation from slice 24 copied to slice 30.

Case 2a – Direct copy of a segmentation on a slice in Dataset 1 to a slice in a different image with the same resolution (Dataset 2)

Python
(0-indexed)



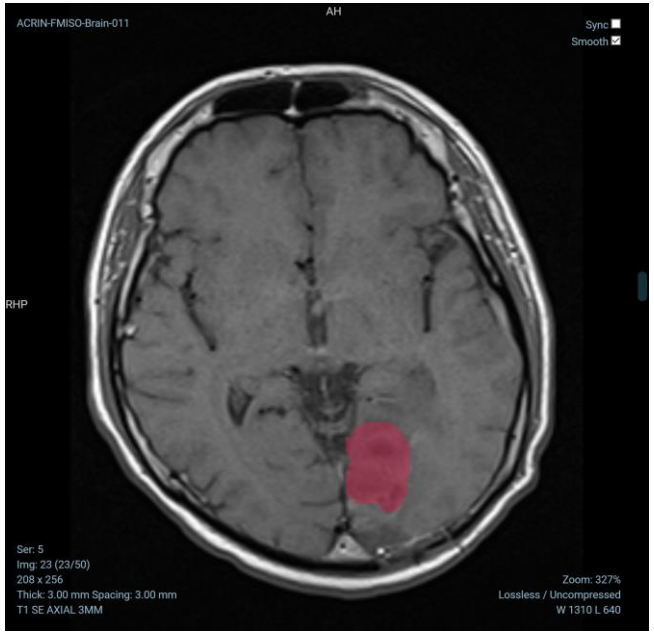
Slice 23



Slice 22

Segmentation from slice 23 copied to slice 22.

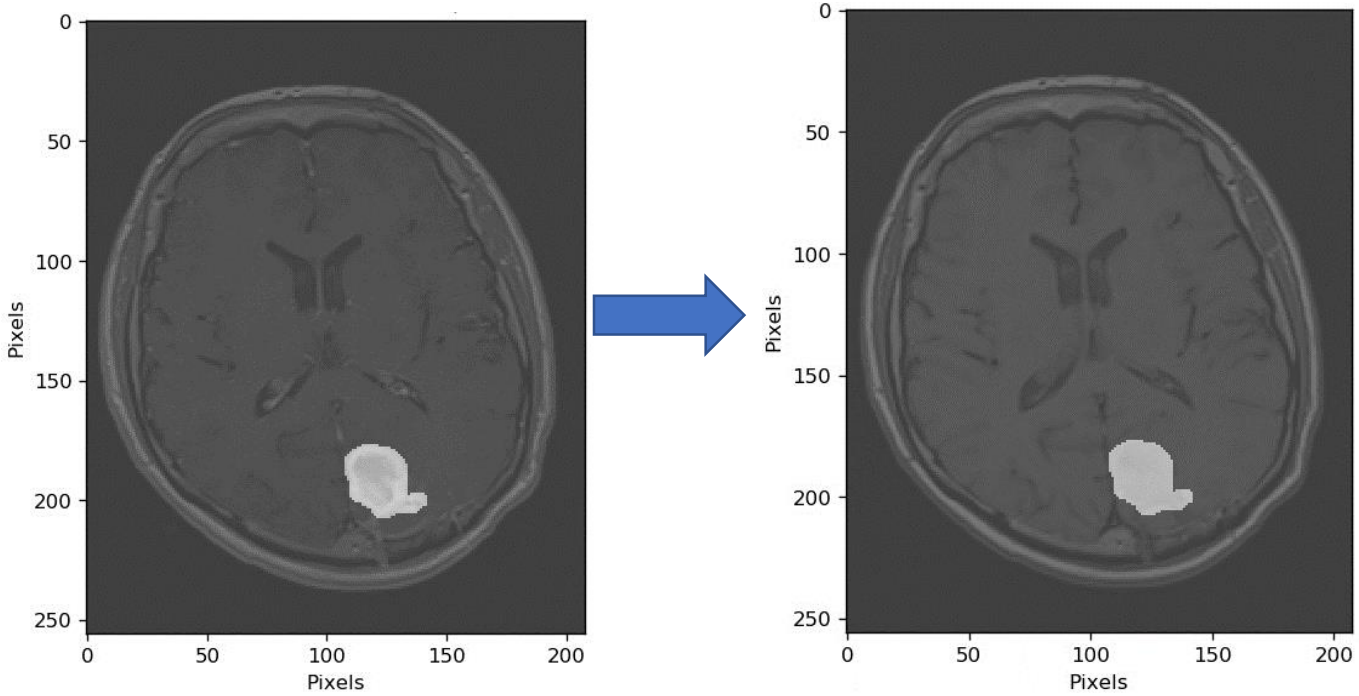
OHIF viewer
(1-indexed)



Segmentation from slice 24 copied to slice 23.

Case 2b – Relationship-preserving copy of a segmentation on a slice in Dataset 1 to a slice in a different image with the same resolution (Dataset 2)

Python
(0-indexed)

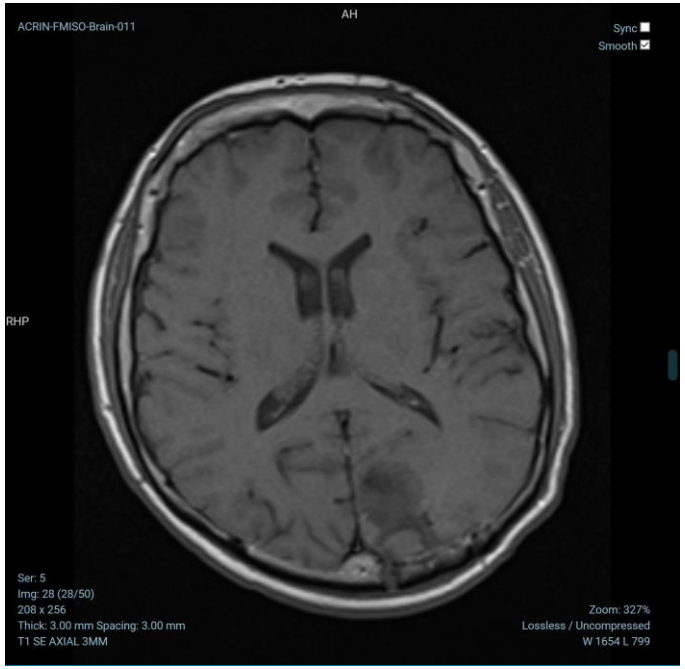


Slice 27

Slice 27

Segmentation from slice 27 copied to slice 27.

OHIF viewer
(1-indexed)

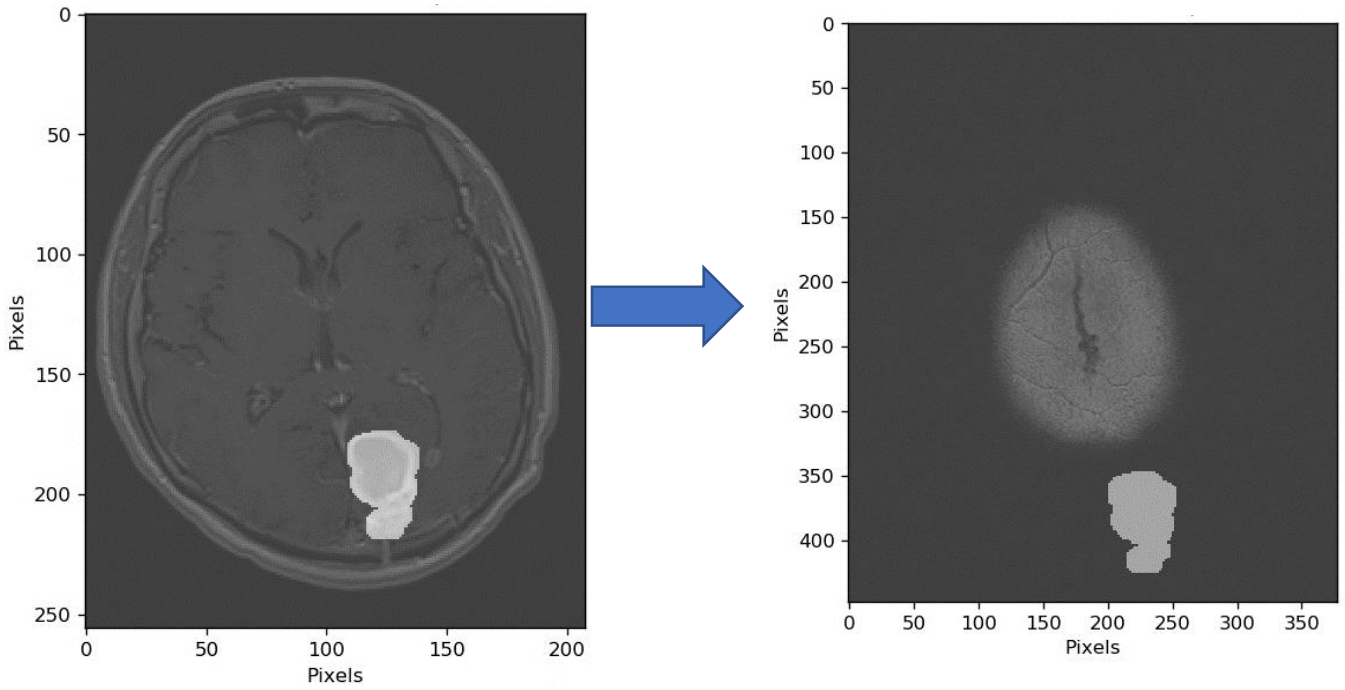


Segmentation not copied.

Case 3a – Direct copy of a segmentation from a slice in Dataset 1 to a slice on a different image with a different resolution (Dataset 3): Sub-case i – thin-to-thick slice thickness

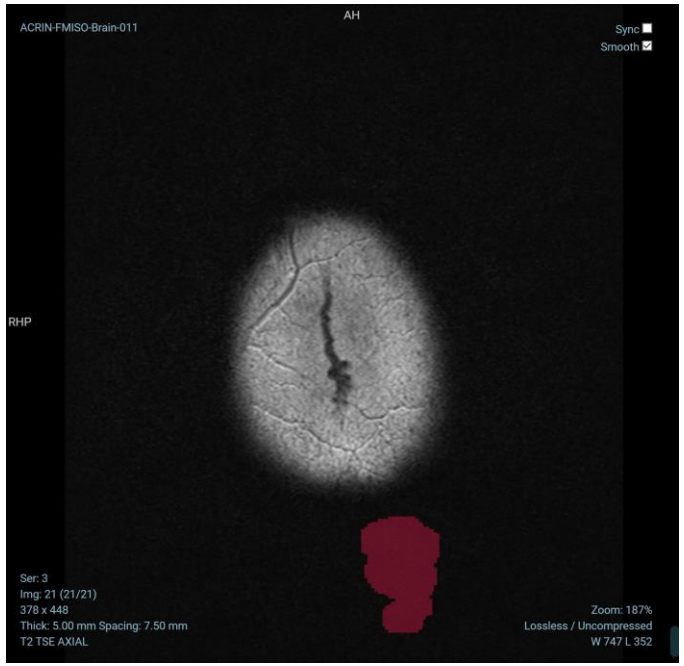
Python
(0-indexed)

OHIF viewer
(1-indexed)



Slice 25

Slice 20



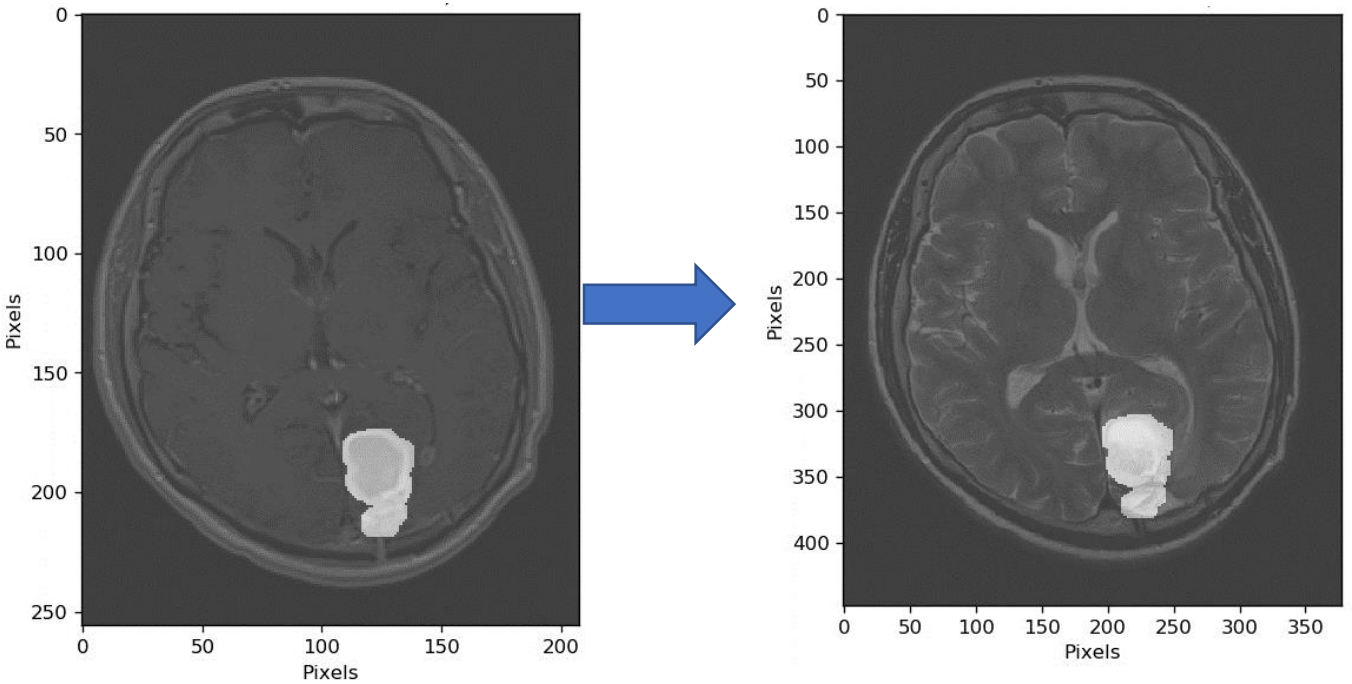
Segmentation from slice 25 copied to slice 20.

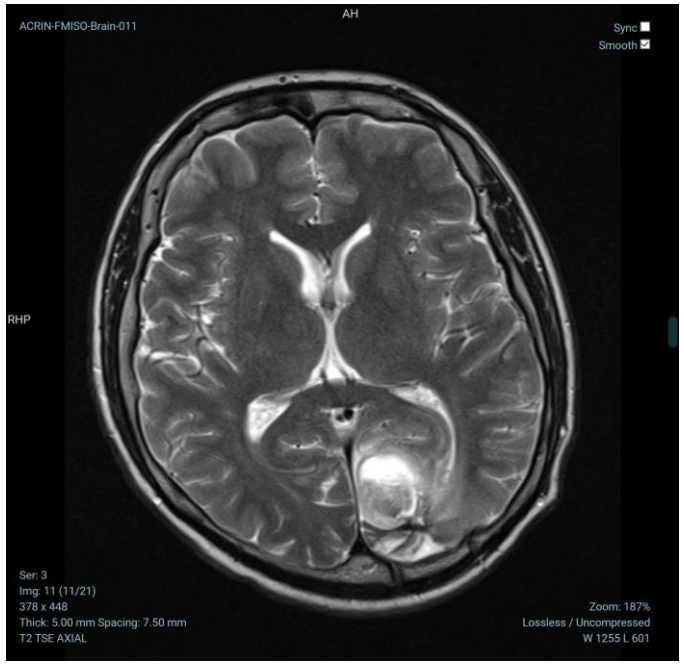
Segmentation from slice 26 copied to slice 21.

Case 3b – Relationship-preserving copy of a segmentation from a slice in Dataset 1 to a slice on a different image with a different resolution (Dataset 3): Sub-case i – thin-to-thick slice thickness

Python
(0-indexed)

OHIF viewer
(1-indexed)





Slice 25

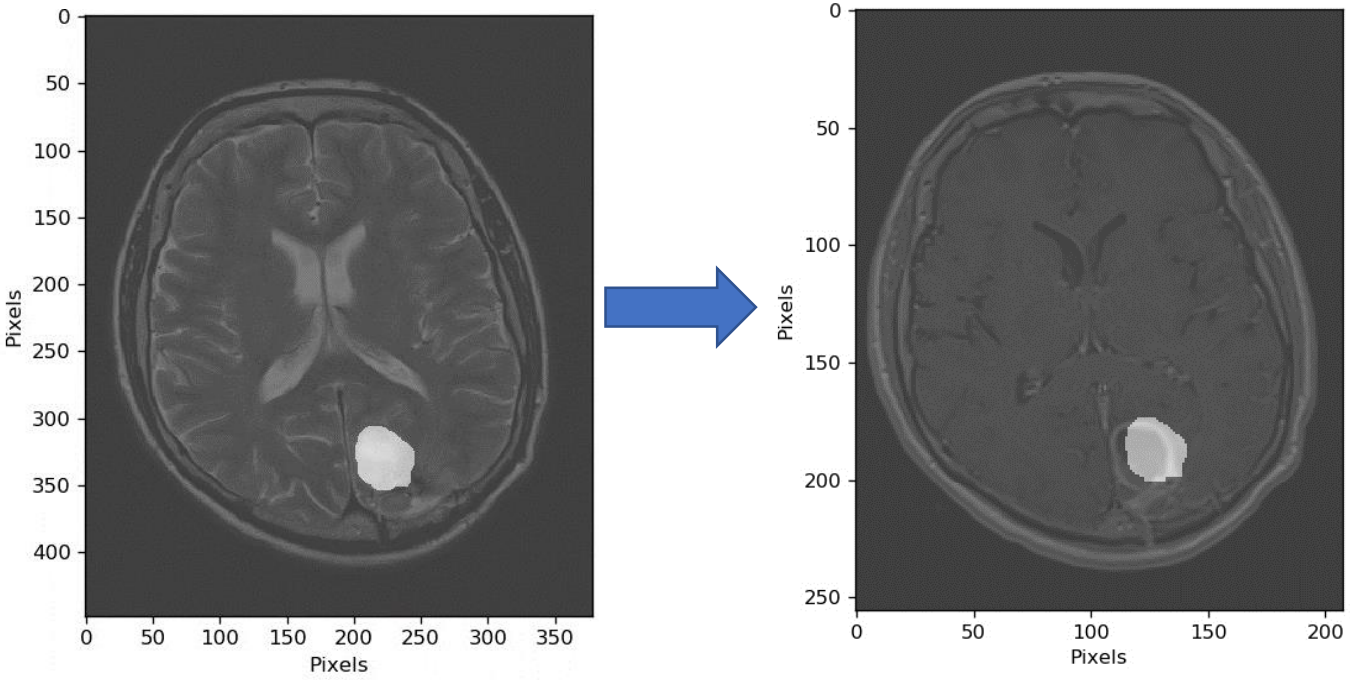
Slice 10

Segmentation from slice 25 copied to slice 10.

Segmentation not copied.

Case 3a – Direct copy of a segmentation from a slice in Dataset 3 to a slice on a different image with a different resolution (Dataset 1): Sub-case ii – thick-to-thin slice thickness

Python
(0-indexed)



Slice 11

Slice 26

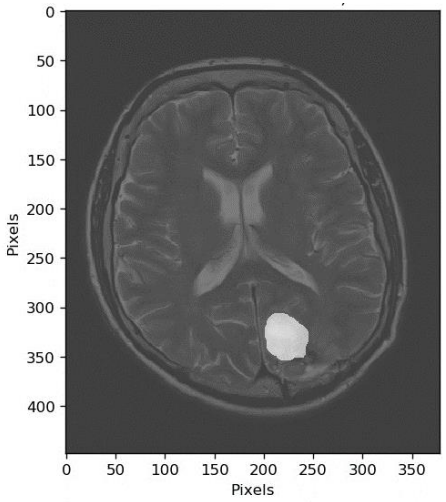
Segmentation from slice 11 copied to slice 26.

OHIF viewer
(1-indexed)

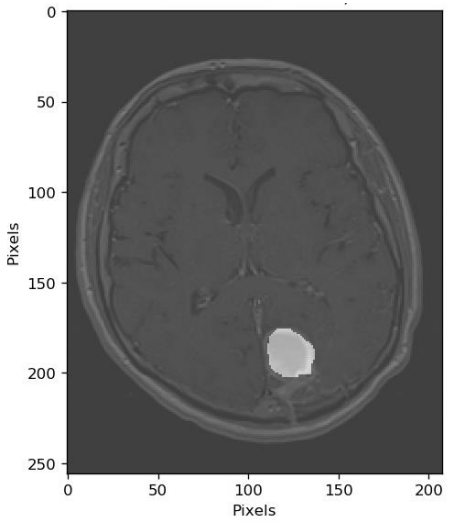
Segmentation from slice 12 copied to slice 27.

Case 3b – Relationship-preserving copy of a segmentation from a slice in Dataset 3 to a slice on a different image with a different resolution (Dataset 1): Sub-case ii – thick-to-thin slice thickness

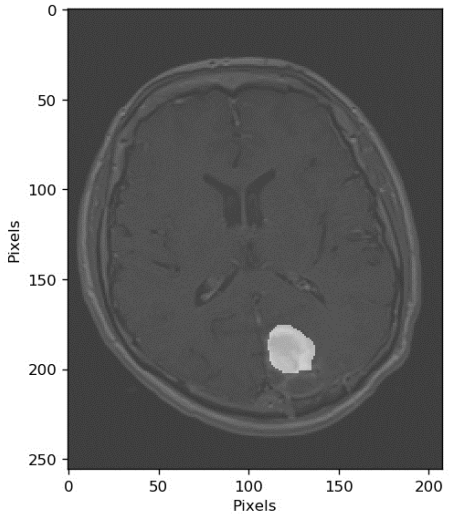
Python (0-indexed)



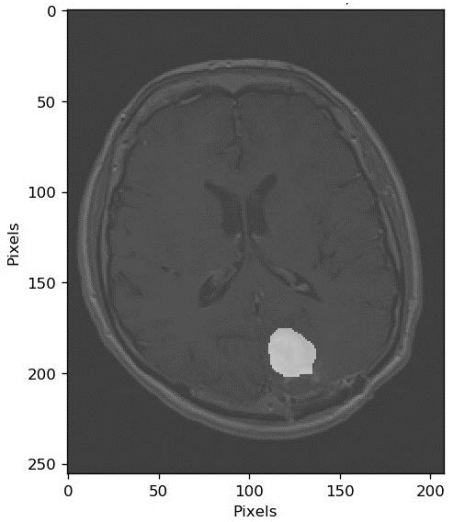
Slice 11



Slice 26



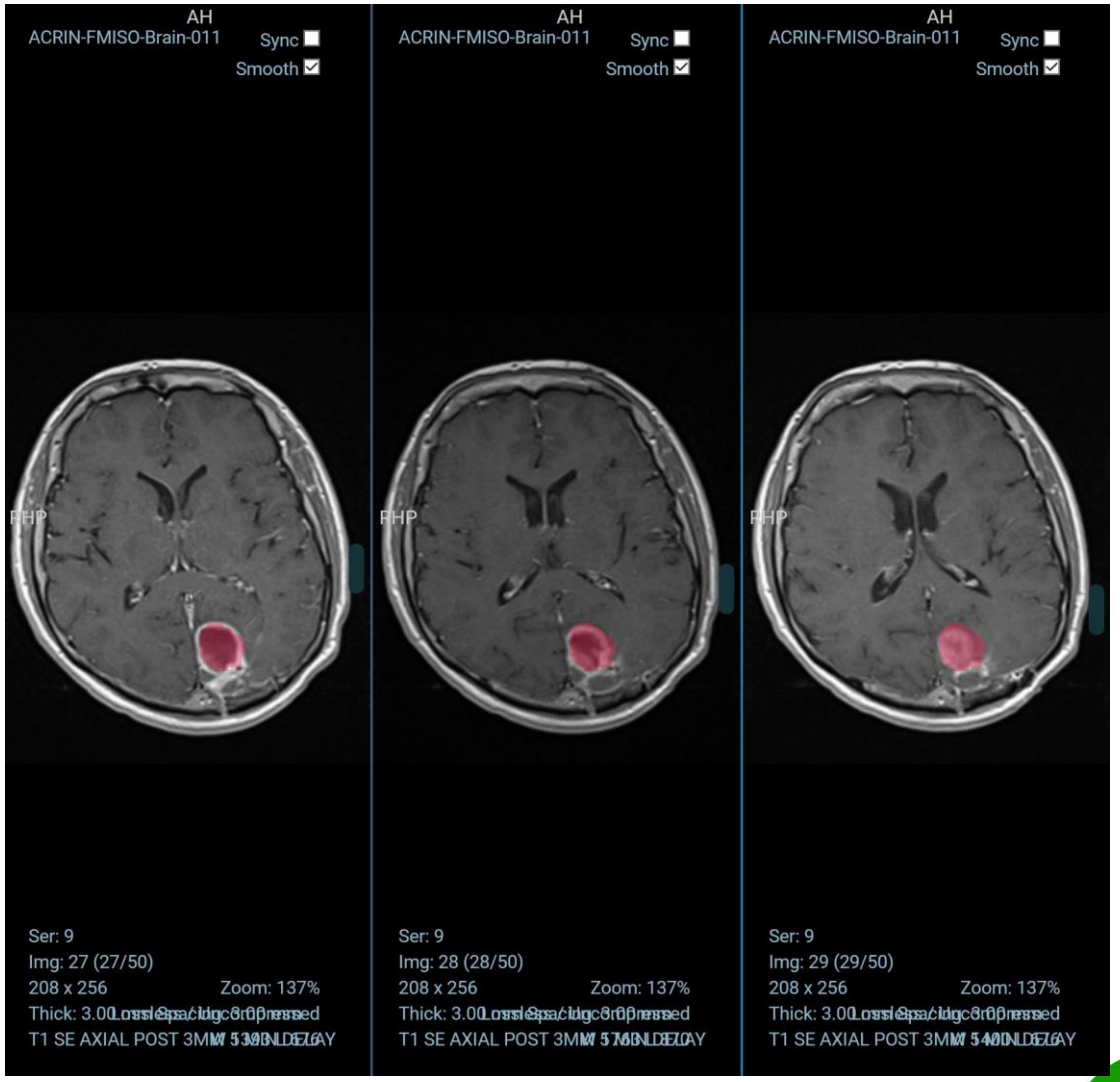
Slice 27



Slice 28

Segmentation from slice 10 copied to slices 26, 27 & 28.

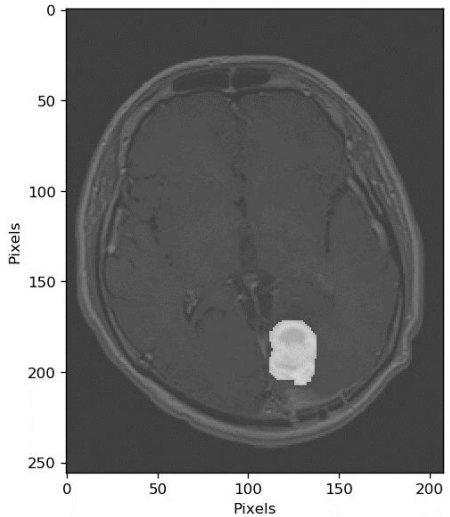
OHIF viewer (1-indexed)



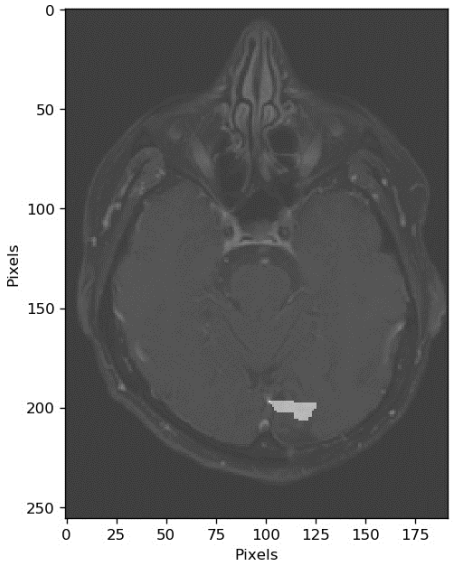
Segmentation from slice 12 copied to slices 27, 28 & 29.

Case 5 – Relationship-preserving copy of a segmentation from a slice in Dataset 1 to a slice on a different image with a different FrameOfReferenceUID, ImageOrientationPatient, resolution (Dataset 4)

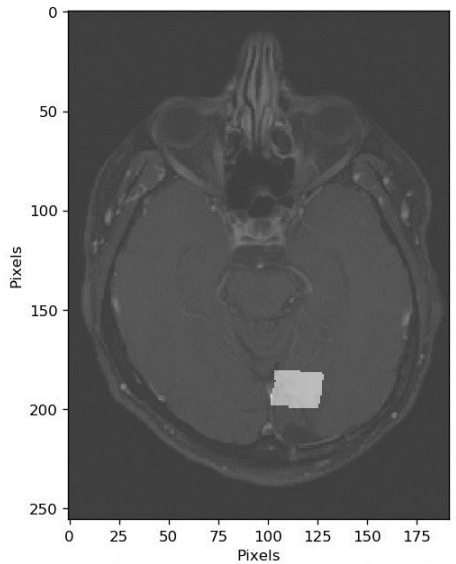
Python
(0-indexed)



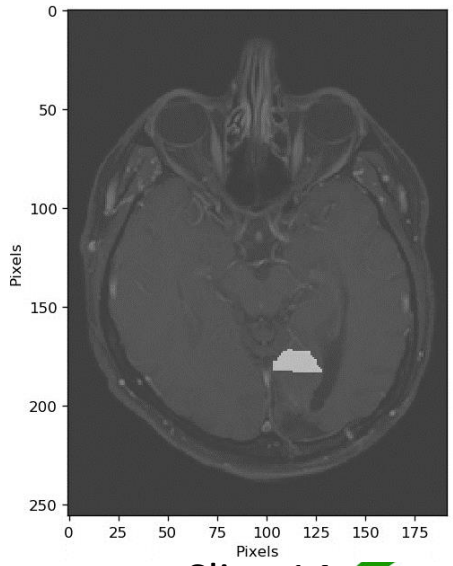
Slice 23



Slice 12



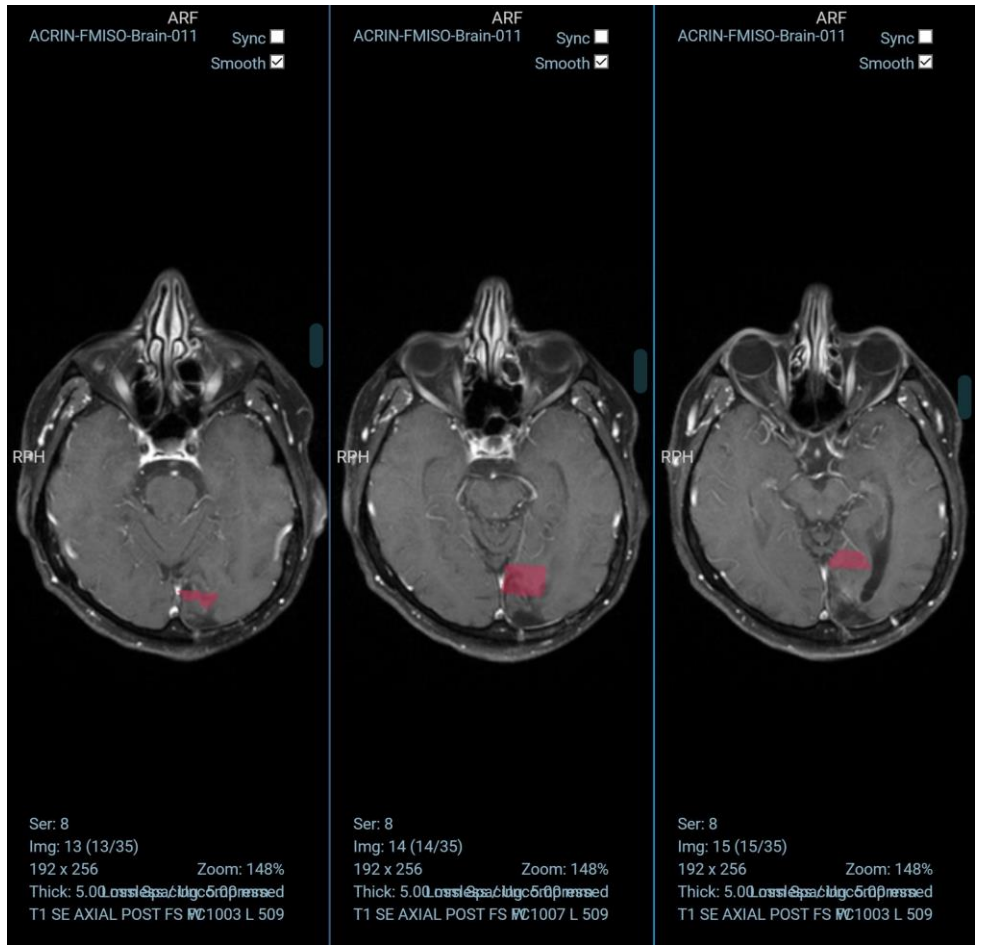
Slice 13



Slice 14

Segmentation from slice 23 copied to slices 12, 13 & 14.

OHIF viewer
(1-indexed)



Segmentation from slice 10 copied to slices 13, 14 & 15.

Dataset source

The data for Datasets 1-4 came from the TCIA:

https://wiki.cancerimagingarchive.net/pages/viewpage.action?pageId=33948305

Subject ID = ACRIN-FMISO-Brain-011

The table below contains further details required to identify and download the DICOMs.

Dataset	Date	Study label	Description
1	Apr 10, 1960	MRI Brain w/wo Contrast	T1 SE AXIAL POST 3MM 5 MIN DELAY
2	Apr 10, 1960	MRI Brain w/wo Contrast	T1 SE AXIAL 3MM
3	Apr 10, 1960	MRI Brain w/wo Contrast	T2 TSE AXIAL
4	Jun 11, 1961	MRI Brain w/wo Contrast	T1 SE AXIAL POST FS FC