

# Medical Image Processing - Final Project

## Authors:

- Javier Sanguino Alcolado
- Max Witwer
- Braden Schweer
- Melanie Werzi
- Tobias Haider

## Preparation

### Load the scripts

```
addpath( "script/NIFTI_reader" );  
addpath( "script/segmentation" );  
addpath( "script/segmentation/plot" );
```

### Import images

```
ct_lungs_noise = load_nii('data/CT_lungs_noise.nii');  
ct_lungs = load_nii('data/CT_lungs.nii');  
ct = load_nii('data/CT.nii');  
pet = load_nii('data/PET.nii');
```

## Image Segmentation

### Exercise 1: Segment the images with Otsu

```
ct_segmentation = otsu_segmentation(ct.img);  
pet_segmentation = otsu_segmentation(pet.img);
```

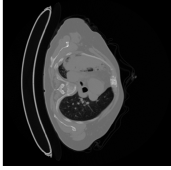
### Exercise 2: Plot the segmentation result

#### CT

```
plot_segmentation(ct.img, ct_segmentation, ct.hdr.dime.pixdim(2:4));  
sgtitle("CT Segmentation");
```

## CT Segmentation

**Axial: Original**



**Coronal: Original**



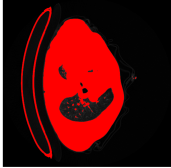
**Sagittal: Original**



**Axial: Segmentation** **Coronal: Segmentation** **Sagittal: Segmentation**



**Axial: Image + Mask** **Coronal: Image + Mask** **Sagittal: Image + Mask**

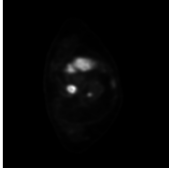


## PET

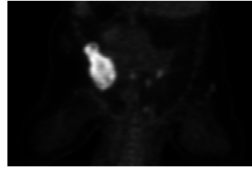
```
plot_segmentation(pet.img, pet_segmentation, pet.hdr.dime.pixdim(2:4));  
sgtitle("PET Segmentation");
```

## PET Segmentation

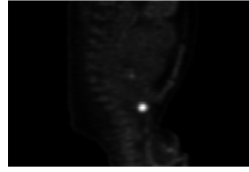
**Axial: Original**



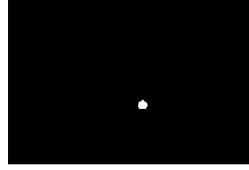
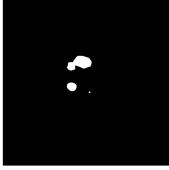
**Coronal: Original**



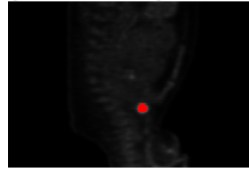
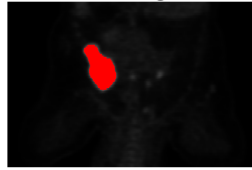
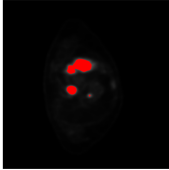
**Sagittal: Original**



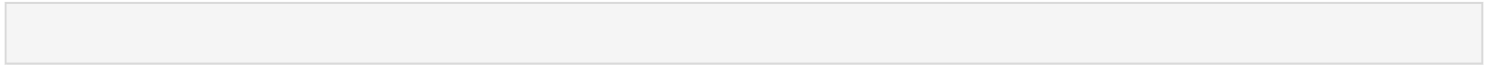
**Axial: Segmentation** **Coronal: Segmentation** **Sagittal: Segmentation**



**Axial: Image + Mask** **Coronal: Image + Mask** **Sagittal: Image + Mask**



## Morphological Filters



## Quantification

