
Proyecto Final Análisis de Imágenes Cardíaco

Integrantes:

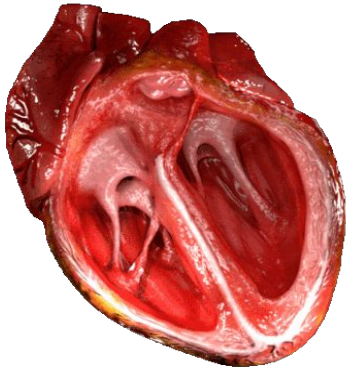
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A partir de un conjunto de
imágenes dcm del
corazón, segmentar el
ventrículo izquierdo para
obtener un modelo 3D



Objetivo

Diagrama de bloques



Procedimiento

Lectura de modelo

```
clc;
close all;
clear;

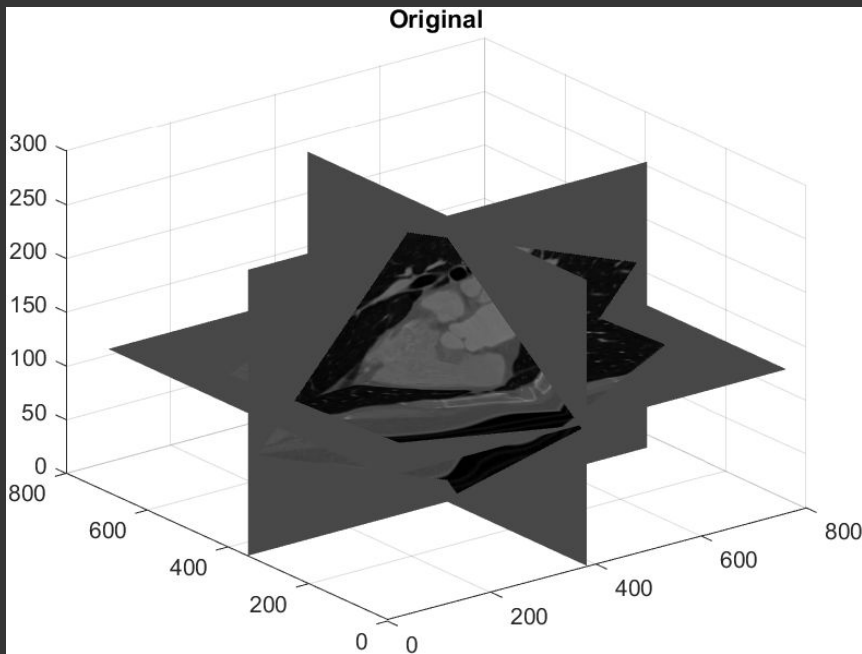
%volume_image
load('VOLUME_IMAGE.mat'); %El modelo esta en hounsfield units

V = squeeze(volume_image);

size0 = size(V);
figure(1)
slice(double(V),size0(2)/2,size0(1)/2,size0(3)/2);
shading interp
colormap("gray")
title("Original")

%Vista con volumeViewer
%V = im2single(V);
%volumeViewer(V);
```

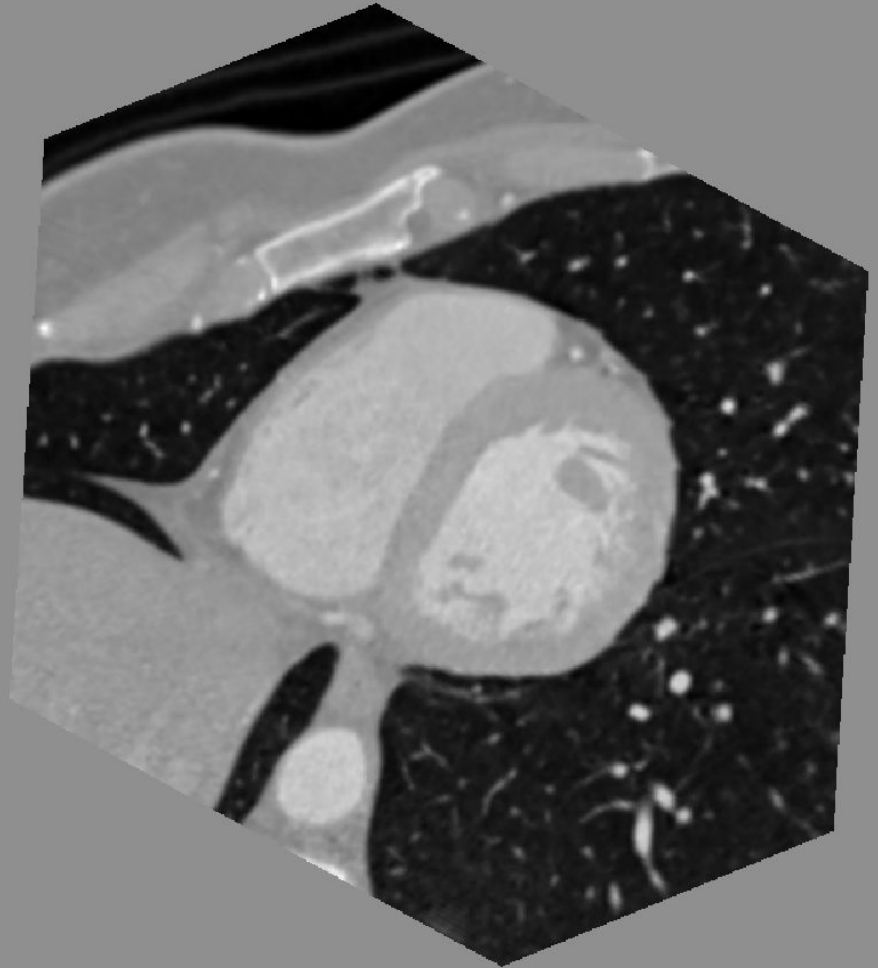
Lectura de modelo



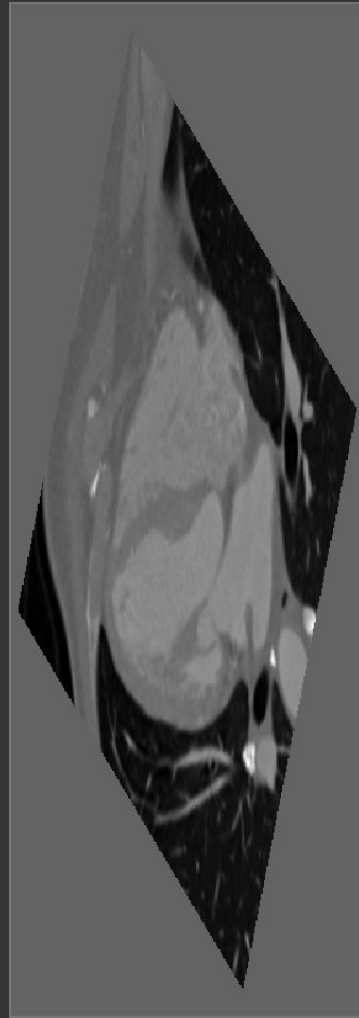
Imágenes seleccionadas

```
XY = V(:, :, 134);  
figure(2)  
imshow(XY, [], "Border", "tight")  
  
XZ= squeeze(V(348, :, :));  
figure(5)  
imshow(XZ, [], "Border", "tight");
```

Imágenes selecciona das XY



Imágene selecciona das XZ



Binarización

```
mask1=(XZ*0);  
mask1(XZ>340)=1;  
SE=strel('disk',4);  
E1=imerode(mask1,SE);
```

```
mask=(XY*0);  
mask(XY>250)=1;  
figure(3)  
imshow(mask)
```

Máscaras

XY Mask



XZ Mask



Segmentación XY

```
% Adjust data to span data range.  
X = imadjust(E1);  
% Create empty mask.  
BW = false(size(X,1),size(X,2));  
% Flood fill  
row = 422;  
column = 130;  
tolerance = 5.000000e-02;  
addedRegion = grayconnected(X, row, column, tolerance);  
BW = BW | addedRegion;  
% Create masked image.  
maskedImageXZ = X;  
maskedImageXZ(~BW) = 0;
```

Segmentación XZ

```
%Funcion del segmento
% Adjust data to span data range.
X = imadjust(mask);
% Create empty mask.
BW = false(size(X,1),size(X,2));
% Flood fill
row = 352;
column = 432;
tolerance = 5.000000e-02;
addedRegion = grayconnected(X, row, column, tolerance);
BW = BW | addedRegion;
% Create masked image.
maskedImageXY = X;
maskedImageXY(~BW) = 0;
```

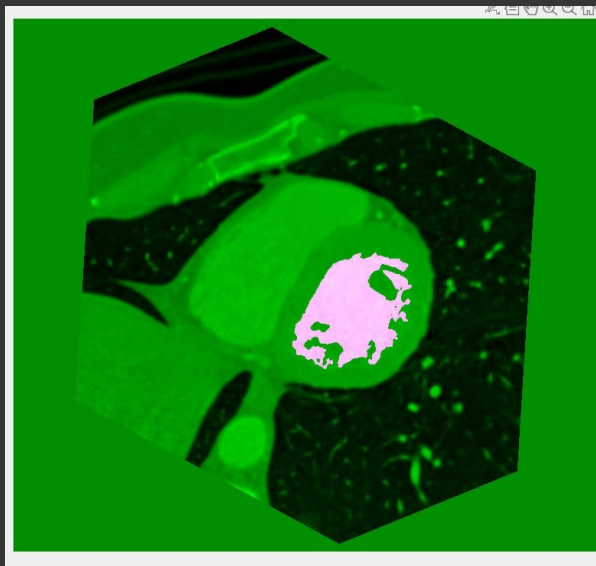
— Segmentación de cada imagen



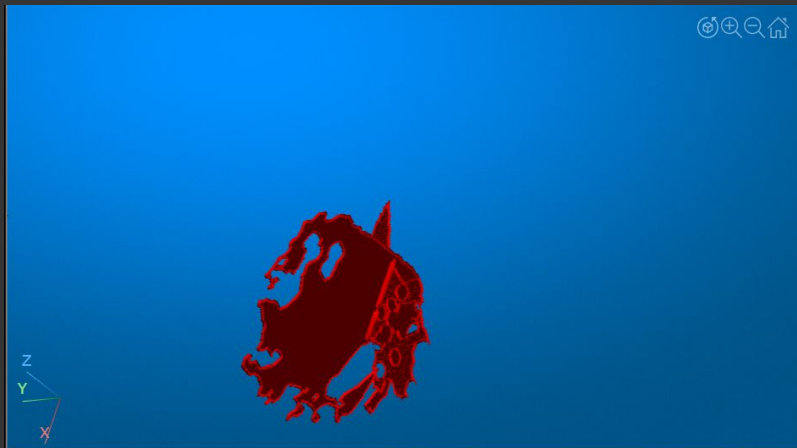
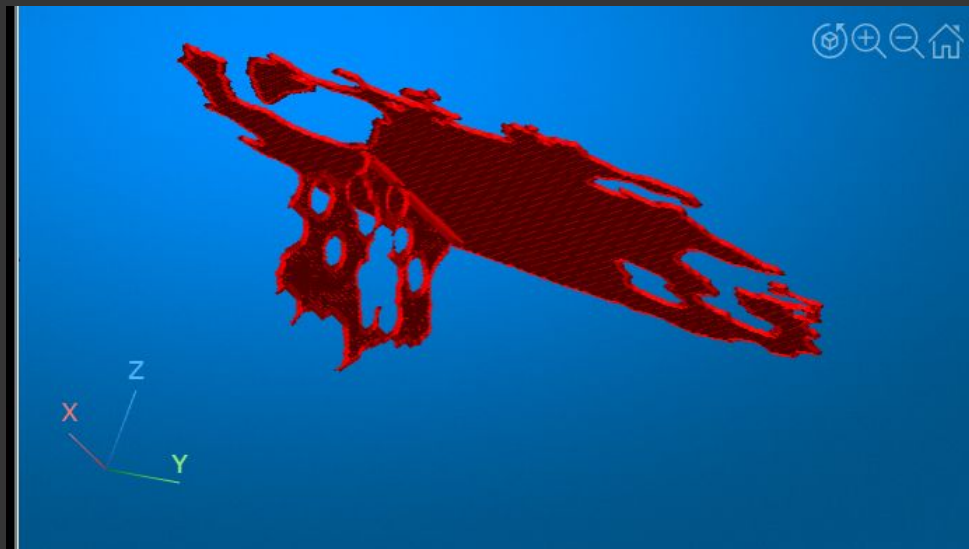
Traslape

```
M1=imfuse(XY,maskedImageXY)
figure(8)
imshow(M1)
M2=imfuse(XZ,maskedImageXZ)
figure(9)
imshow(M2)
```

Traslape de máscaras y cortes

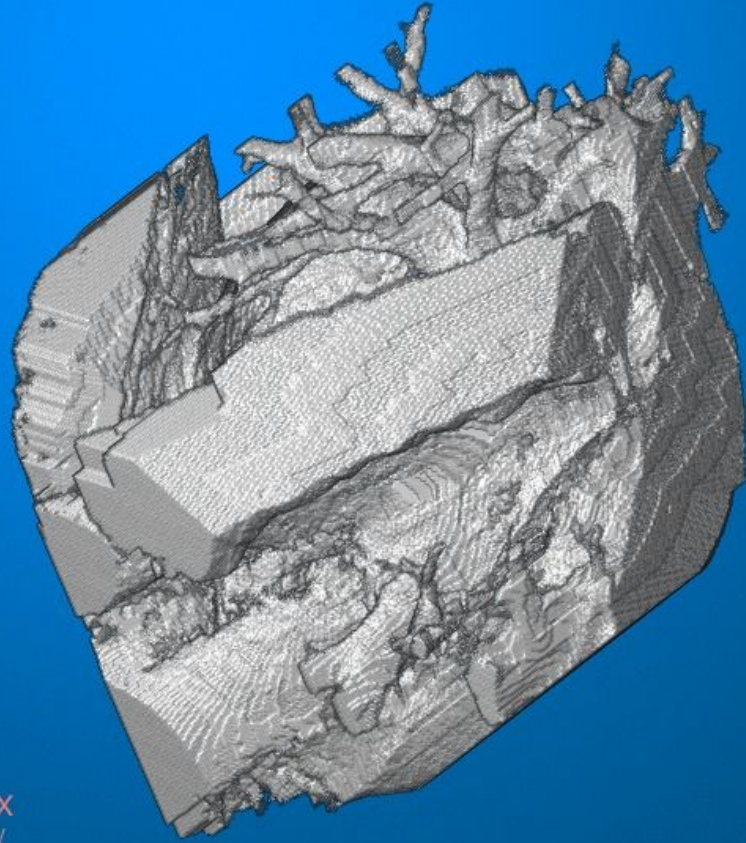


Traslape de máscaras en 3D



Modelo 3D

```
mask3 = false(size(V));  
mask3(:, :, 134) = maskedImageXY;  
mask3(348, :, :) = mask3(348, :, :) | reshape(maskedImageXZ, [1, 763, 267]);  
%Creacion del modelo 3D  
V = histeq(V);  
  
BW = activecontour(V, mask3, 100, "Chan-Vese");  
  
segmentedImage = V.*single(BW);  
  
volumeViewer(segmentedImage)
```



Modelo 3D obtenido