**MATLAB Homework 05**

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**Codes location:** [**https://github.com/yifuhhh/EE385J\_Biomed\_Image/tree/master/HW05/Submission**](https://github.com/yifuhhh/EE385J_Biomed_Image/tree/master/HW05/Submission)

1. **For each patient, display the image slices with tumors, with your ROI displayed on top of it.**
2. Discuss how you determined what was cancerous from healthy tissue. (What were your assumptions).

The slices with tumors are shown below. Slice 5 ~ 7 of Patient 1 and Slice 1 ~ 8 of Patient 2 are chosen here for ROI analysis.

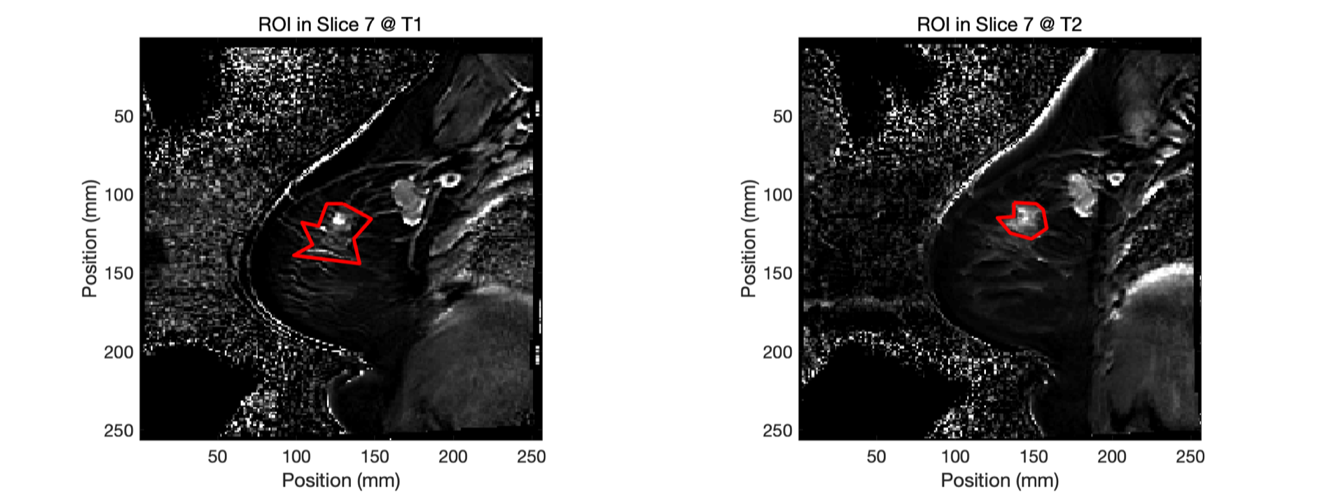
The criteria I determined what was cancerous from healthy tissue is based on the color and contrast in the image. The boundary of the tumor is blurry, and the shape is irregular.

**Patient 1:**

图片包含 树

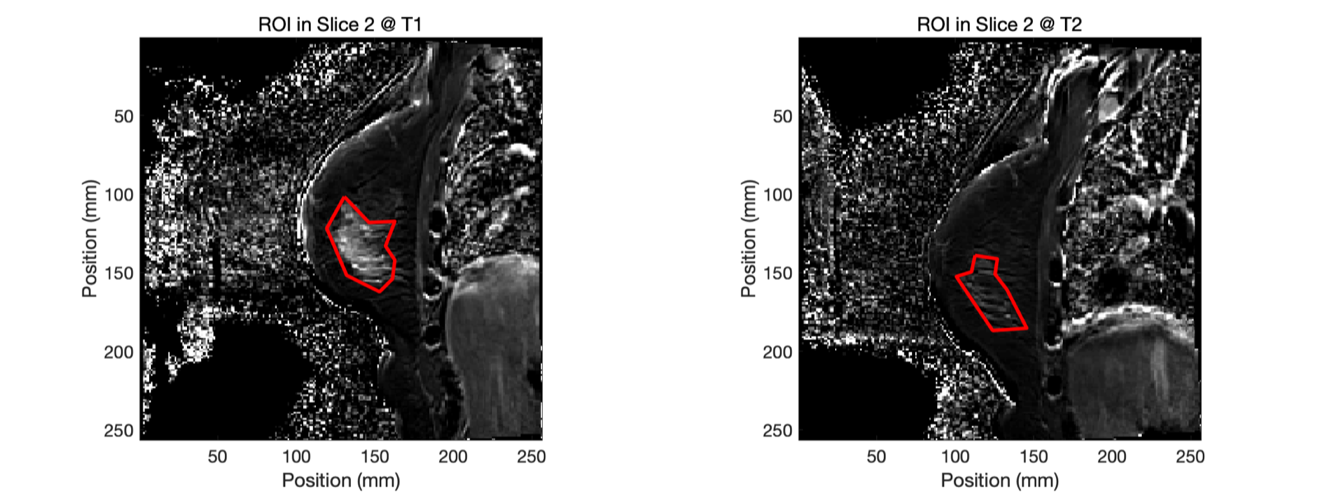
描述已自动生成

图片包含 动物

描述已自动生成

**Patient 2**

图片包含 树

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描述已自动生成

1. **Create/code up a RECIST function that returns the longest dimensions at each time point, and the RECIST criteria (CR, PR, SD, PD).**

function maxdist = solvedist(mask)

ind = find(mask == 1);

[x, y, z] = ind2sub(size(mask), ind);

tumor\_arr = [x, y, z];

npoints = size(tumor\_arr);

for i = 1 : npoints % select one voxel,

for j = 1 : npoints % loop through all the other voxels, calculate distance

dx = x(i) - x(j);

dy = y(i) - y(j);

dz = z(i) - z(j);

dist(j) = sqrt(dx^2 + dy^2 + (dz \* 5)^2); % store distance for each voxel

end

mdist(i) = max(dist); % store maximum distance for voxel "i"

end

maxdist = max(mdist);

end

1. **Calculate patient response**

|  |  |  |
| --- | --- | --- |
|  | **Volume change** | **RECIST criteria** |
| **Patient 1** | -51.12% | PR |
| **Patient 2** | -14.91% | SD |

The advantage of RECIST is that it represents a common language of efficacy for clinical researchers across disease sites and clinical trial settings. The major disadvantage of RECIST is the reliance on human measurement.

It’s hard to compare my results directly with others since different people have different measurement method to choose the ROI. However, we can analyze the results from all the students in the class by looking at the distribution of the RECIST criteria so that we can get a general idea of the situation of the patient response.