LAB 1. IMAGE PRE-PROCESSING

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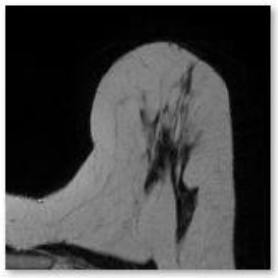
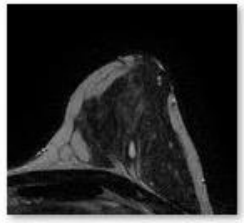
Aim and data

- Understand the effects of each of the pre-processing steps seen in the class.
  - Bias field removal. Use MICO algorithm (matlab implementation).
  - Inter-patient normalisation
  - Anisotropic diffusion.
- DATA: 6 breast T2 MRI images from different patients (in png format)


pa1-16_t2.png


pa2-16_t2.png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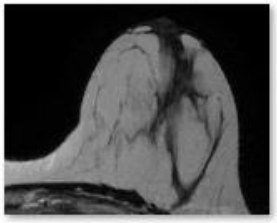
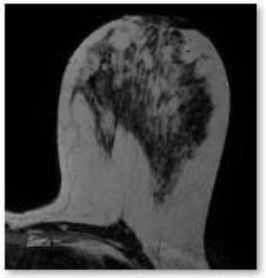
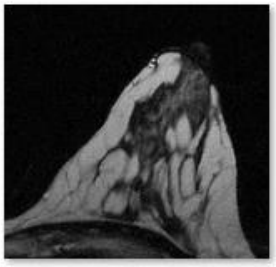

pa4-16_t2.png


pa5-16_t2.png


pa6-16_t2.png

1.1 Bias field removal (1h)

- Download the MICO algorithm for bias field removal.
- Investigate its parameters and how to run it with default images.
- Run the program for all data and generate the bias-free images.
- Deliver
  - Matlab code.
  - Image results before and after bias removal.

1.2 Patient Normalisation (1h)

- Do the histogram of all patients
- Perform intensity normalisation with one of the methods seen in the class.

- Deliver
  - Matlab code.
  - Image results before and after normalisation.
  - Histogram before and after normalisation.
  - Bonus: compare without bias-field removed images.

1.3 Anisotropic diffusion (1h)

- Evaluate the effects of each of the parameters of the anisotropic diffusion
  - Understand the file anisoDiff2D.m
  - See the effects of the parameters on the MRI and Ultrasound image.
  - Use dicomread and dicominfo to read the images.
  - Modify the code to perform isotropic smoothing (similar to Gaussian smoothing).
- Deliver
  - Matlab code.
  - Image results before and after smoothing.