AVPR Lab: Assignment 1

Automatic nipple detection in breast thermograms

Description: In the last two decades, several computer-aided diagnosis (CAD) systems for the early detection of breast cancer have been proposed. Breast cancer CAD systems consist of many steps, such as segmentation of the region of interest, feature extraction, classification and nipple detection. Indeed, the nipple is an important anatomical landmark in thermograms. The location of the nipple is invaluable in the analysis of medical images because it can be used in several applications, such as image registration and modality fusion.

The paper titled 'Automatic nipple detection in breast thermograms' proposes an unsupervised, automatic, accurate, simple and fast method to detect nipples in thermograms. The main stages of the proposed method are: human body segmentation, determination of nipple candidates using adaptive thresholding and detection of the nipples using a novel selection algorithm.

Requirements:

-Read the paper and implement the nipple detection algorithm in MATLAB.

-Validate the implemented algorithm with the attached images (test.zip).

-Write a report in which you describe and discuss the results of your algorithm.

Deliverables [Due 29/10/2020]:

-A MATLAB function (nipple_your_last_name.m) that receives a thermogram as input and returns the input image including the location of the nipples overlaid on it (as described on the results section of the attached paper).

-Report in a pdf format.