

Development of a new Computer Aided Diagnosis system based Multimodal Fusion for breast cancer analysis

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Context and Goals

Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death in females' worldwide. In order to improve research and clinical practice, the idea of the project is to develop a new computer aided diagnosis (CAD) based on multimodal fusion between the two modalities (IRM/mammography).

In order to develop a new CAD system with a low computational cost, we have proposed a hybrid intelligent system. The architecture for the proposed CAD breast imaging system is shown comprises four main processes for (i) image preprocessing, (ii) segmentation of ROI, (iii) feature extraction, selection and fusion and (iv) classification of the selected ROI and performance evaluation.



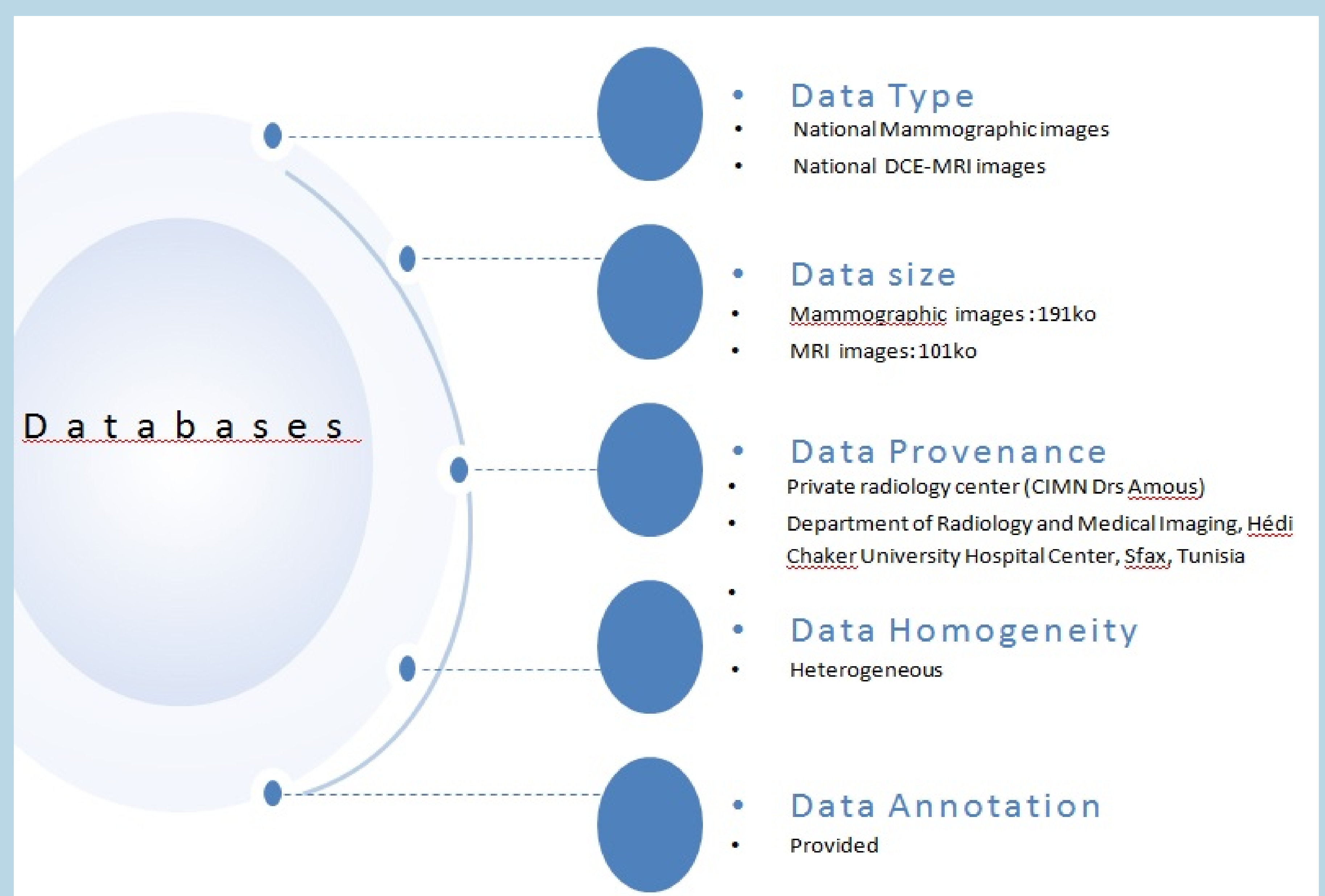
Purpose of the work and its impact



Economize on expert effort expended on the initial assessment in the knowledge that a second look will be required before the final assessment.

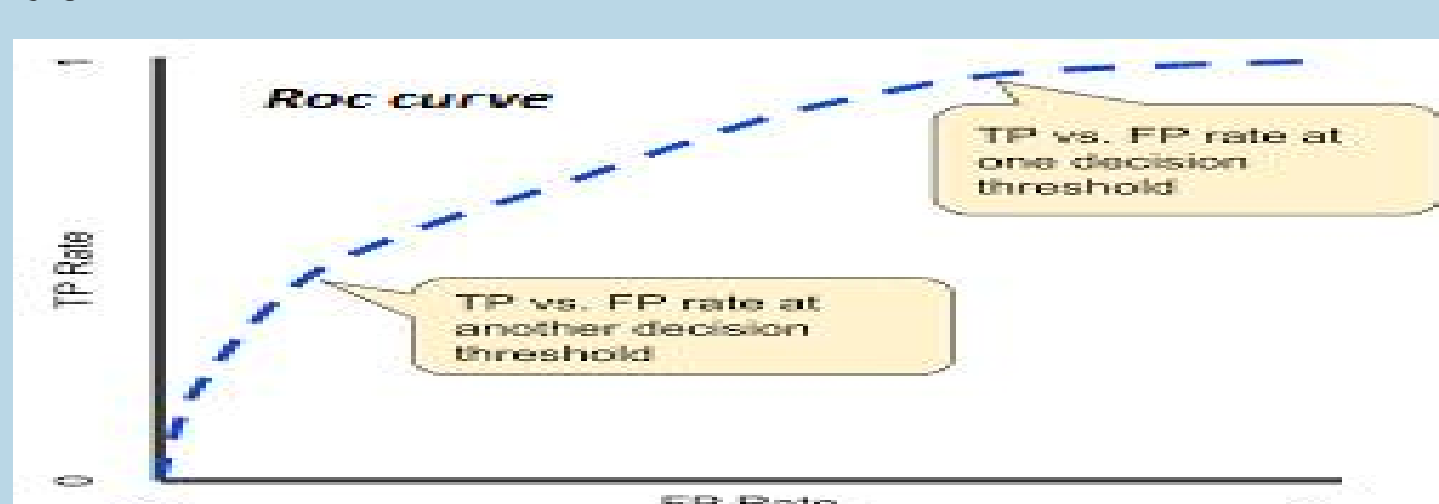
- Allows a rapid and timely diagnosis of breast Cancer images
- May significantly improve patient's life by applying appropriate procedures.

Methods of Data Processing



Evaluation Metrics

- Segmentation accuracy with Dice Similarity Coefficient (DSC).
- ROC curve for the evaluation of the proposed system.



Expected Outcome

- Automatic segmentation of lesions in mammographic and DCE-MRI images.
- Development of novel automatic segmentation workflow of axial breast DCE-MRI and 3-D Reconstruction of tumors.
- Classification of tumors.
- Multimodal fusion between the two treated modalities (mammographic and DCE-MRI images).
- Development of a Tunisian database.

