

INSTITUTO SUPERIOR TÉCNICO

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REPORT

STATE OF THE ART MILESTONE

State Of The Art Essay: A First Approach

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1 Introduction

The Medical Imaging Multimodality Breast Cancer Diagnosis is a topic of great interest, it has been the subject of much work in the world of medicine, but few developments in terms of innovation in the computational world. An Application like this has a wide spectrum fields reference from surveillance based systems to medical application.

A vast majority of masses and calcifications can be accurately diagnosed from cytological features [1] of the cells that constitute them. However, the diagnostic accuracy depends on the training, experience, and many indefinite factors of interpretation of the medical expert in cytological evaluation.

There was, in fact, some developments in the past facing the classification system Computer-Based [2, 3] that assists in the diagnosis of breast cells based on visual assessment of characteristics of the cells. [4] A set of cytologic features, previously evaluated visually, are now replaced by digital ones, evaluated by image analysis. In this project we will compare the human precision in cytological diagnosis of breast cancer by digital image analysis accuracy combined with Computer-Based Machine Learn classification.

References

- [1] William H. Wolberg, W. Nick Street, Olvi L. Mangasarian. Breast Cytology Diagnosis. *Via Digital Image Analysis*, 1993.
- [2] Bennett KP, Mangasarian OL. Robust linear programming discrimination of two linearly inseparable sets. *Optimization Methods and Software* 1:23-34, 1992.
- [3] Mangasarian OL. Multi-surface method of pattern separation. *IEEE Transactions on Information Theory* IT-14:801-807, 1968.
- [4] Wolberg WH, Mangasarian OL. Multisurface method of pattern separation for medical diagnosis applied to breast cytology. *Proceedings of the National Academy of Sciences, U.S.A.* 87:9193-9196, 1992.