Topic (see web page listing)	Medical and Biological Measurements
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DIAGNOSTIC PERFORMANCE OF THERMOGRAMS AND MAMMOGRAMS FOR BREAST CANCER DETECTION

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Introduction

Breast cancer arises as the second leading cause of cancer death worldwide after lung cancer, and accounts for about 15 percent of cancer deaths in women. As there is no effective method for its prevention, detection and treatment at an early stage, X-ray mammography is presently the standard tool for detecting breast cancer. However, mammography compresses the breasts tightly (and often painfully), which could lead to a lethal spread of any existing malignant cells. As mammograms require very small doses of radiation, the risk of harm from this radiation exposure is extremely low, although repeated x-rays have the potential to cause cancer. Even more, these exams have a high rate of false positive.

Breast thermography was first introduced as a breast screening tool in the late 1950's and it has been approved to use since 1982 and it was initially well accepted. However, several studies have demonstrated the inefficiency of thermal imaging as compared with mammography, so the medical community quickly lost their interest in thermography and its application has been greatly limited. Due to recent developments in thermographic cameras, additional research should be done to confirm and/or to continue to develop the potential of this technology as an adjunctive tool of mammography to provide early detection of breast cancer.

In this paper we carry out a comparative study between mammograms and thermograms, involving 200 women, in order to bring a new light on the current situation of thermography as an effective tool to support mammography in prevention and monitoring the breast cancer.

Materials and Methods

During this study, the 200 patients who had been under a mammography examination in the national breast cancer screening programme of the Portuguese Cancer League (Liga Portuguesa Contra o Cancro - LPCC), were also submitted to a thermographic examination, after giving informed consent. The images were collected by a thermal camera (FLIR 365) positioned at a fixed distance of 1 metre of the women's breast. Temperature and humidity control in the imaging room was maintained at a stable temperature within the range of 18°C to 23°C during the examination. Potential sources of additional heat were eliminated from the imaging room in order to reduce thermal artifacts.

Experimental Results and Discussion

Currently we are waiting for the reports of mammography exams performed by radiologists, in order to make the comparison between thermograms and mammograms.