Transfer learning in mammography

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Abstract

This is the paper's abstract ...

1 INTRODUCTION

When data for training complex neural network is limited, (thousands oppose to millions of images) transfer learning becomes a necessary tool. Transfer learning is the process of taking a network that has been trained on a large dataset, such as ImageNet, and retraining only the final layer on a new dataset.

This technique has the potential for far more complex networks to be trained on a small dataset of mammograms and achieve high classification accuracies.

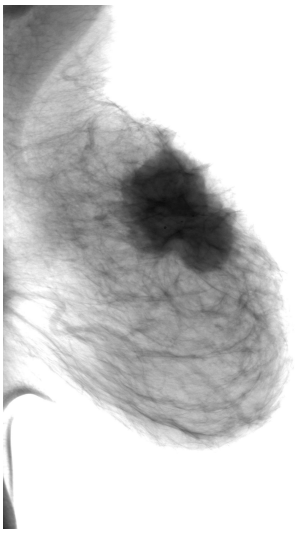
2 METHODOLOGY AND PRELIMINARY RESULTS

2.1 Pre processing the images

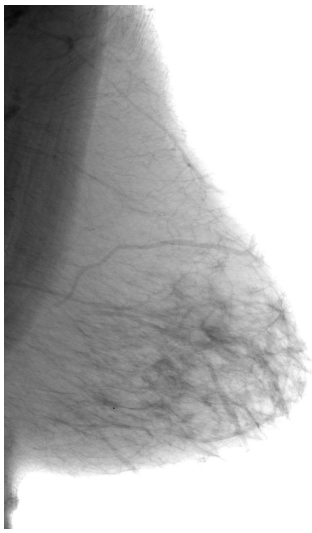
The dataset is comprised of 2980 DICOM images where 1489 are mammograms which are malginant (contain a cancer) and 1490 which are of a healthy breast (not cancerous). The DICOM image format is the international standard to transmit, store, retrieve, print, process and display medical imaging information [1].

The images are large and varying in size, around 2000 by 3000 pixels, 13 bit grey scale. Before using the images to train a neural network, the ROI (region of interest) coordinates will be found so that they can be cropped to a much smaller size (200 by 200 pixels) with the cancer, if apparent, centred in the image.

3 CONCLUSIONS



(a) Cancer present.



(b) Healthy tissue - no cancer

Figure 1: Example of the full image mammograms. The original DICOM images were 13 bit and these have had the contrast windowed to 8 bit so that they can be printed and displayed on conventional monitors.

REFERENCES

[1] (2018). Dicom - home, [Online]. Available: `https://www.dicomstandard.org/` (visited on 07/12/2018).