Using Machine Learning to Suppress the Skin Response in Breast Microwave Sensing

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Introduction
It is estimated that 1 in 8 Canadian women will get breast cancer in their lifetime and 1 in 33 will die from breast cancer [1].

Breast Cancer Screening
Currently, x-ray mammography is the most used breast cancer screening modality, but mammography has drawbacks [2]:
• Use of ionizing x-rays
• Compression of the breast can be uncomfortable for women
• High false positivity rate leads to unnecessary levels of stress and anxiety in women and families

Microwave Imaging
Microwave imaging uses non-ionizing radiation and is based on the dielectric contrast between healthy and malignant tissues.

The Skin Response
The skin response obscures the response of the tumor making it difficult to determine if a tumor is present.

Methods
Network

Datasets
Simple Simulations:

Results
Simulated dataset

Experimental dataset using transfer learning

Conclusion
Machine learning shows promise in suppressing the skin response in breast microwave sensing, although more work is required to determine the feasibility of this method.

References and Acknowledgements