

Workshop#2:

Machine Learning Techniques Used for Breast Cancer Detection

Dr. Fatemeh Saki

Breast cancer is now the most frequently diagnosed cancer in women, and its percentage is continuously increasing. Early detection and intervention are significant in establishing an up-to-date prognosis process that can successfully mitigate complications of the disease with higher recovery chance. Therefore, researchers have established numerous machine-learning automated methods for accurately predicting the growth of cancer cells utilizing medical imaging modalities. The recent rapid advancement of deep learning and image processing has created hopes in devising more enhanced computer-aided diagnosis (CAD) systems that can be used for the early detection of breast cancer. In this work, we present:

- the existing and more recent deep-learning-based architectures, analyze the strengths and limitations of these studies.
- review the image pre-processing techniques.
- provide benefits and risks of various breast multi-imaging modalities, segmentation schemes, feature extraction, classification of breast abnormalities through state-of-the-art deep-learning approaches.
- provide a concrete review of the performance metrics.
- explore various well-known databases to present a comprehensive survey on the existing diagnostic mechanisms to open-up new research challenges the researchers to intervene as early as possible to develop effective and reliable breast cancer detection systems using prominent deep learning schemes.



Dr. Fatemeh Saki is a staff R&D engineer with the Advanced Audio Technology team at Qualcomm Inc. in San Diego, USA. She has received her PhD in electrical engineering from the University of Texas at Dallas in 2017. Her research interests include signal and image processing, machine learning and deep learning, and real-time implementation on embedded processors. She has authored or coauthored more than 40 journal papers, conference papers, patents, and books, editorials in these areas. She is the reviewer of the NeurIPS, ICLR, ICML, IEEE Transactions on Biomedical Circuits and Systems, and Computer Methods and Programs in Biomedicine.

Skyroom Link: <https://www.skyroom.online/ch/mvip2022/workshop>

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10AM-12AM {22 February 2022 (3th of Esfand 1400)}