



# BCGNN:Machine Learning based Breast Cancer Classification improvement Using Graph Neural Network

Alireza Kazempoor Choobari\*

Sadegh Sulaimany<sup>†</sup>

## Abstract

Breast cancer has seen a significant rise in incidence and mortality rates in recent years. Machine learning techniques have been extensively employed to diagnose and classify this disease. Ensemble learning methods, in particular, have gained prominence for binary breast cancer classification. In this study, we leveraged the Wisconsin Breast Cancer (WDBC) Dataset and introduced a novel approach using graph neural networks for breast cancer classification. In this work, we are transforming numerical data from a dataset into a graph and applying Graph Neural Networks (GNNs) to it. We are also considering the embedded graph features. Our results demonstrate a remarkable average accuracy of 98.83%, along with precision, recall, and F1-score values of 99.07%. These findings strongly suggest that graph neural networks outperform previous methods in terms of accuracy and overall performance. Our primary objective was to develop a more accurate classification model for breast cancer, and the results obtained through graph neural networks have successfully achieved this goal.

**Keywords:** Breast Cancer Classification, Machine Learning, Graph Neural Network, Graph Convolutional Network.

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\*Social and Biological Network Analysis Laboratory(SBNA), Department of Computer Engineering, University of Kurdistan, Sanandaj, Iran, [alireza.choobari@uok.ac.ir](mailto:alireza.choobari@uok.ac.ir)

<sup>†</sup>Social and Biological Network Analysis Laboratory(SBNA), Department of Computer Engineering, University of Kurdistan, Sanandaj, Iran, [s.sulaimany@uok.ac.ir](mailto:s.sulaimany@uok.ac.ir)