The results of the evaluation metrics for the tested U-Net, ConvNet, and Densenet-169 models are shown in Table II.

From Table II of the results and the statistical analysis, we can see that the ConvNet model has outperformed all other models by a considerable margin, reaching an accuracy of 91 % and a precision of up to 85%. The accuracy score of the U-Net model is 0.82%, and the accuracy of the DenseNet-169 model is 73.0%. The DL is adaptable to the specific characteristics of the breast ultrasound image datasets provided. Hence, comparing the three types of DL shows different results for the tested dataset.

IV. Conclusion

Cancer is one of the most deadly diseases that have targeted human beings. It is usually diagnosed at a very advanced stage when it is not easily curable. Breast cancer is complicated to detect at an early stage and is the third deadliest form of cancer, with prostate and pancreatic cancer being the first and second, respectively. This is a clear indication of the need to develop better breast cancer diagnostic techniques to aid in early identification and treatment. This paper analyzes and compares three selected DL types of CNN to classify breast cancer images. The performance of the U-Net, ConvNet, and DenseNet-169 models is tested on the breast ultrasound images. The test results are compared based on the accuracy, recall, precision, and F1-score evaluation metrics. The results indicate that the ConvNet model has the highest accuracy score of 91%, the highest precision of 85%, the highest recall of 83%, and the highest F1 score of 83%. The results of the three DL models in this work suggest improving the ConvNet model for enhancing the automated breast cancer diagnosis by incorporating transfer learning with pre-trained networks like ResNet or DenseNet. Also, in the data preparation phase, extensive data augmentation is used to enhance the generalization of the trained data.

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