**BREAST CANCER DIAGNOSIS USING IMAGE PROCESSING AND MACHINE LEARNING FOR ELASTOGRAPHY IMAGES**

**ABSTRACT**

As a trending medical imaging technique, Elastography and B-mode (ultrasound) are combined as a diagnostic tool to differentiate between benign and malignant breast lesions based on their stiffness and geometric properties. Image processing techniques are applied to the resulting images for feature extraction. Data preprocessing methods and principal component analysis (PCA) as a dimensionality reduction technique are applied to the dataset. In this paper, supervised learning algorithm “support vector machine (SVM)” is used for the classification of combined elastogram and B-mode images. Model validation is performed with K-fold cross-validation to ensure the generalization of the algorithm. Accuracy, confusion matrix, and logistic loss are then evaluated for the used algorithm. The maximum classification accuracy is 94.12% when using SVM with radial basis function (RBF) kernel.

**Keywords**—Breast Cancer, Elastography, Image Processing, Principle component analysis, Support Vector Machine (SVM).