

## **ABSTRACT**

Breast cancer still ranks among the most common causes of cancer-related deaths among women, hence the call for early diagnosis. Mammography is the most accepted screening test, but conventional Computer Aided Detection (CAD) has a high false positive rate (FPR) that gives rise to biopsy and false negatives (FN) where cancer is undetected. In solving these challenges, this paper provides a solution by employing the use of the Simple Genetic Algorithm (SGA), which is openly inspired from biological systems to enhance the performance of CAD systems for breast cancer detection. The SGA, which is based on the evolutionary process, can resolve problems in feature selection and classification of the mammogram by overcoming shortcomings of pattern recognition. By mimicking the genetic evolution process, ant colony optimization, and swarm intelligence, the SGA prevents noisy or variant images to anyhow decrease the detection accuracy. Comprehensive tests on typical sets of mammograms confirm the effectiveness of the proposed approach regarding a twofold reduction of inappropriate positive and negative results. This enhanced accuracy of diagnoses can help radiologists to act early, combined with favorable outcomes for the patients, implying that early diagnosis may save lives.