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|  | **Department of Computer Science and Engineering**  Bangladesh University of Business and Technology (BUBT) | BUBT |

**CSE 498: Literature Review Records**

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| **Student’s Id and Name** | **Name:** Sm Raziur Rahman Pushon, **ID:** 19202103214 |
| **Project Title** | Deep Learning in Healthcare: Breast Cancer Detection and Classification using Image Processing and CNN |
| **Supervisor Name & Designation** | **Name:** Khan Md. Hasib, **Designation:** Assistant Professor, Department of CSE, BUBT |
| **Course Teacher’s Name & Designation** | **Name:** Khan Md. Hasib, **Designation: :** Assistant Professor, Department of CSE, BUBT |

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| **Aspects** | **Paper # 01 (Title)** |
| **Title / Question**  (What is problem statement?) | Comparative Study of Machine Learning Algorithms for Breast Cancer Detection and Diagnosis. |
| **Objectives / Goal**  (What is looking for?) | The purpose of the research is to compare and assess the efficacy of three well-known machine learning methods for the detection and diagnosis of breast cancer: Support Vector Machine (SVM), Random Forest (RF), and Bayesian Networks (BN). In terms of important metrics like accuracy, recall, precision, and the area under the ROC curve, the study seeks to evaluate the efficacy of different machine learning techniques. The ultimate goal is to offer insights into cutting-edge machine learning methods for breast cancer screening. |
| **Methodology/Theory**  (How to find the solution?) | In this study, machine learning (ML) approaches are used to address the challenge of breast cancer detection and diagnosis. It evaluates the performance of three ML approaches, namely Support Vector Machine (SVM), Random Forest (RF), and Bayesian Networks (BN), in identifying benign or malignant breast cancers. The study makes use of information from the Wisconsin Original Breast Cancer dataset and assesses the effectiveness of the classifiers using measures including recall, accuracy, and precision. Finding the most effective ML method for an early and precise diagnosis of breast cancer is the objective. |
| **Software Tools**  (What program/software is used for design, coding and simulation?) | The precise software or program used for design, coding, and simulation is not mentioned in the paper. However, it goes into great detail about how Machine Learning (ML) methods like Support Vector Machine (SVM), Random Forest (RF), and Bayesian Networks (BN) can be used to find and diagnose breast cancer. Programming languages like Python and libraries/frameworks like scikit-learn and TensorFlow are frequently used to build these ML algorithms. Depending on the preferences and machine learning platforms that the researchers are most comfortable with, several tools and programs may be employed. |
| **Test / Experiment**  How to test and characterize the design/prototype? | The specific software or tools used for design, coding, and simulation are not covered in detail in the paper. The employment of three machine learning techniques (Support Vector Machine, Random Forest, and Bayesian Networks) for the detection and diagnosis of breast cancer is nonetheless mentioned. It does not disclose the software used for these evaluations, which are based on performance criteria like accuracy, recall, precision, and the area under the Receiver Operating Characteristic (ROC) curve. As a result, there are no specifics provided in the study regarding the software or tools used for design, coding, or simulation. |
| **Simulation/Test Data**  (What parameters are determined?) | The paper establishes numerous criteria, such as accuracy, recall, precision, and the area under the ROC curve, to evaluate the efficacy of machine learning algorithms for the identification of breast cancer. Support Vector Machine (SVM), Random Forest (RF), and Bayesian Networks (BN) classifier performance is compared using these parameters. These factors serve as the basis for the findings and discussions in the study that assess how well the machine learning algorithms work. |
| **Result / Conclusion**  (What was the final result?) | According to the paper's concluding findings, Support Vector Machine (SVM) outperformed all other machine learning algorithms for breast cancer detection in terms of accuracy, specificity, and precision. In terms of classification accuracy, SVM surpassed Bayesian Networks (BN) and Random Forest (RF). The likelihood of correctly categorizing tumor features was highest with RF, though. The study provides the precise numerical data and details, however the conclusion is that SVM showed the best overall performance. |
| **Obstacles/Challenges**  (List the methodological obstacles if authors mentioned in the article) | Methodological barriers aren't mentioned in the article specifically.. |
| **Terminology**  (List the common basic words frequently used in this research field) | SVM , ROC , RF ,BN. |
| **Review Judgment**  (Briefly compare the objectives and results of all the articles you reviewed) | Since this is my first article review on the subject, i am unable to compare the goals and outcomes. The clarity and thoroughness of the material presented, the difficulty of the subject, and the unique needs of the user are just a few of the variables that ultimately determine how well the process works. |
| **Review Outcome**  (Make a decision how to use/refer the obtained knowledge to prepare a separate and new methodology for your own research project) | With a systematic approach, I can build a new method for my research project using the knowledge I learned from the publications. Prior to anything else, it's critical to understand the articles' goals, procedures, findings, and conclusions. The application of the information learned to the objective of my project is then analyzed. I must apply the information by taking project requirements and variable considerations into account. |