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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 # 04 (Title)** |
| **Title / Question**  (What is problem statement?) | A Brief Survey on Breast Cancer Diagnostic with Deep Learning Schemes Using Multi-Image Modalities. |
| **Objectives / Goal**  (What is looking for?) | The paper's objective is to present a thorough review of deep learning applications in the diagnosis of breast cancer, summarizing imaging modalities, deep learning methodologies, datasets, and research obstacles to direct future developments in the area. |
| **Methodology/Theory**  (How to find the solution?) | The research discusses different deep learning techniques for diagnosing breast cancer, such as CNNs, DL, and ANNs. Additionally, it investigates various imaging modalities, databases, and data preprocessing methods. The method involves applying deep learning to enhance medical image analysis for breast cancer diagnosis and classification. |
| **Software Tools**  (What program/software is used for design, coding and simulation?) | Its main purpose is to survey and review the literature on deep learning-based breast cancer diagnosis. Depending on the particular research projects listed in the paper, the software and tools may change. For coding and simulation in this field, researchers frequently combine deep learning frameworks like TensorFlow or PyTorch with programming languages like Python. |
| **Test / Experiment**  How to test and characterize the design/prototype? | On testing and characterizing the deep learning models for breast cancer diagnosis, the research doesn't go into great detail. But in comparable situations, testing entails preparing a dataset, training the models, validating their performance during training, and assessing them using a different test dataset. The models are assessed for their strengths and limitations using performance indicators like accuracy and sensitivity. Depending on the study goals and model types, several methodologies are used. |
| **Simulation/Test Data**  (What parameters are determined?) | The study examines a number of factors connected to deep learning models' use in the diagnosis of breast cancer, including imaging modalities, feature extraction, deep learning models, performance measures, data augmentation, segmentation, preprocessing, training, and testing data, as well as computer resources. For the purpose of developing, testing, and refining deep learning models for precise breast cancer diagnosis, these factors are essential. |
| **Result / Conclusion**  (What was the final result?) | It discusses various deep learning models, techniques, and challenges related to breast cancer diagnosis using multi-image modalities. The accuracy is 96.33%. |
| **Obstacles/Challenges**  (List the methodological obstacles if authors mentioned in the article) | The essay explores several methodological challenges in the area of deep learning and many picture modalities for breast cancer diagnosis. These difficulties include issues with data scarcity, the intricate structure of the breast, the need for computational resources, data augmentation, inter-observer variability among radiologists, restrictions on publicly accessible databases, the best threshold selection for image analysis, and the requirement for models to generalize successfully across various populations and breast densities. These challenges highlight how difficult it is to create computer-aided detection methods for breast cancer that are accurate and trustworthy using cutting-edge technologies. |
| **Terminology**  (List the common basic words frequently used in this research field) | Breast cancer, computer-aided-diagnosis, deep learning techniques, medical image analysis, lesions classification, segmentation. |
| **Review Judgment**  (Briefly compare the objectives and results of all the articles you reviewed) | The four articles under consideration all deal with the diagnosis of breast cancer, but they all have different goals and conclusions. High accuracy rates for the detection of breast cancer are the goal of Articles 1 and 2, which create and evaluate machine learning and deep learning models. The area is thoroughly surveyed in Articles 3 and 4, which also stress the necessity for large datasets and analyze the advantages and disadvantages of various methodologies. |
| **Review Outcome**  (Make a decision how to use/refer the obtained knowledge to prepare a separate and new methodology for your own research project) | Using the information I gathered from the publications and a methodical approach, I may create a new methodology for my research endeavor. Prior to doing anything else, it's important to comprehend the papers' objectives, methods, findings, and conclusions. Then, the application of the knowledge gained to the goal of my project is examined. I must use the knowledge while taking into account the needs of the project and the variables. |