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Using Internet of Things (IOT) Data to Reduce Cancer Risk in Women

Mrs. Shajeni Justin[1], Dr. Kanagaraj Naranasamy[2]

[1]Research Scholar, Department of Computer Science, Karpagam Academy of Higher Educations, Coimbatore
[2]Assistant Professor, Department of Computer Science, Karpagam Academy of Higher Educations, Coimbatore

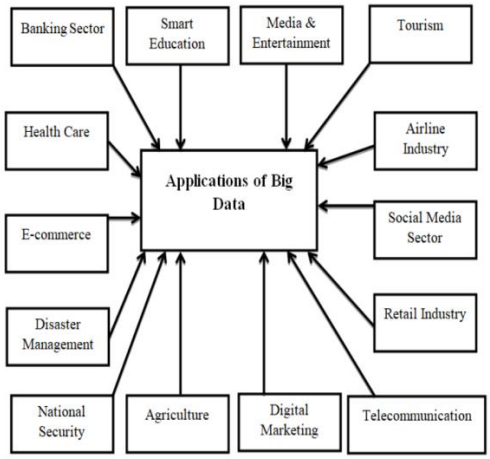
Abstract
Apply IoT-based big data processing to support breast cancer diagnosis and prevention. This work supports criticism of the role of the IoT in big data, mainly for cancer diagnosis. To detect breast cancer by processing big data from the Internet of things. Much of the research has focused on helping healthcare professionals and others diagnose diseases more effectively. The role of the Internet of Things is being studied. A total of 20 women were tested for early symptoms of breast cancer and some of the factors that lead to breast cancer. Doctors can accurately assess day-to-day weight-related symptoms. Blood pressure and the global prevalence of breast cancer.

Keywords: Internet of Things (IoT), vector learning scale, adversarial learning network. backpropagation algorithm.

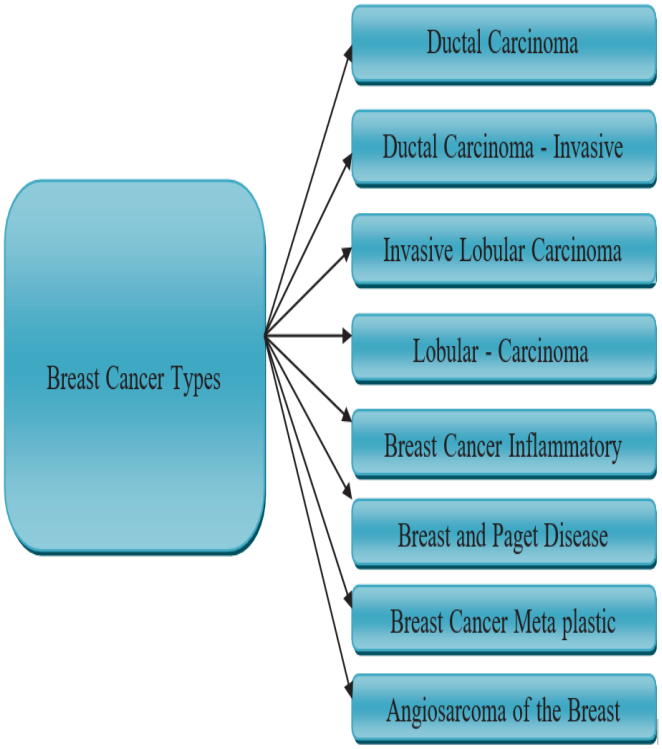
Internet of Things in Cancer Detection

The overall goal of this study is to help diagnose breast cancer through IoT-enabled big data processing.[1] The research aims to understand what contributes to effective disease diagnosis for clinicians and other professionals

- **Internet of things:** This is the Internet, which connects objects capable of storing and exchanging data.
- **One of the fastest-growing technologies** is one of the fastest-growing technologies in the world, bringing many benefits to society, industry, and consumers.
- **Personal problems:** There is growing concerned about the possibility of increased government oversight in a data-driven future and the possibility of violating civil liberties as a result, fueling resentment and oppression of marginalized communities.
- **Secure Communication:** Sensitive data must be encrypted in transit, including device characteristics and proper remote control and monitoring of its use.The volume, data generation, and variety all magnify the problems associated with big data. Unique security vulnerabilities are created by large-scale Cloud frameworks, a good range of information sources and formats, the streaming of information acquisition, and high volume between cloud migration.



To make it flexible: IoT hardware and software must be adaptable when utilised by other reliable systems. In order to get the required outcomes, doctors can use patient reports to examine large amounts of data from potent Internet of Things (IoT) devices. Physicians can quickly assess patient data from various IoT devices to easily identify symptoms and create a suitable treatment plan. [2,3] The suggested study demonstrates how Internet of Things (IoT) devices' dependability on Internet services compromises user security and privacy. Because of this, once a user's Fitbit tracker or other Internet of Things (IoT) device is compromised, the attacker has full access to the user's home network. According to statistics, there has been a



Type of breast cancer

Internet of Things (IoT), -enabled big data technology can be used by clinicians to accurately estimate daily weight, blood pressure, and symptoms associated with the growing number of breast cancer patients around the world.

type of breast cancer

1. Ductal carcinoma in situ (DCIS)
2. Invasive ductal carcinoma (IDC)
3. Invasive lobular carcinoma (ILC).
4. Lobar carcinoma in situ (LCIS)
5. Inflammatory breast cancer (IBC)
6. Paget's disease of the breast (or nipple)

Literature Review

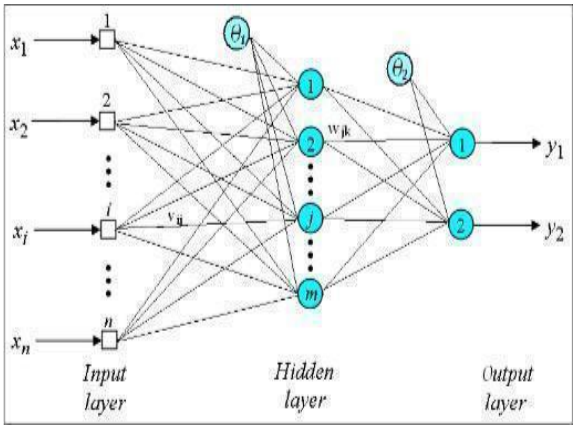
A technique for the automatic detection, classification, evaluation, and categorization of breast cancer using feed-forward neural networks was presented by Shekhar and colleagues [4]. Sensitivity, accuracy, and specificity were calculated and found to be comparable. In the end, they came to the conclusion that a feedback neural network can do quick and accurate categorization. et al. Muhammad Sufyan bin Muhammad Azmi A feed-forward neural network was also used to classify cases of breast cancer. Seven hidden layer neurons were determined to have the highest accuracy after they built and trained the network using various hidden layer neuron models.[7,8]

R. R. Jungli and others Back Propagation Algorithm (BPA), Radial Basis Function Network (RBFN), Learning Vector Quantization (LVQ), and Competitive Learning Network are four of the neural network models that have been deployed (CL). The analysis revealed that the LVQ classification is the most accurate for spotting breast cancer [6]. SamarandaBerchuk and others Four data sets were used to evaluate a partially connected neural network method, and the results are comparable to those of a fully connected neural network. A. Khosravi and others Three modules make up the proposed hybrid system for breast tumours. A hybrid algorithm B is provided by the learning component (BA). Utilizing a Perceptron Multilayer Neural Network, the classification module (MLP). High accuracy is attained.

Method and Implementation

Supervised method for training artificial neural networks. A multilayer neural network with feedback propagates errors without loops. Hence the name "neural network". A neural network with feedback consists of several stages of block processing. Each layer forwards the input to the next layer in a predictable way, adding weights. By choosing the right architecture for a feedforward neural network, you can perform many discovery tasks. Classification problems that are not linearly separable are called "hard problems".

Linear separability control for pattern classification problems. While feed-forward multilayer networks solve complex problems, "hard-to-learn" load-balancing problems require the network to infer basic functional relationships between specific I/S pairs. I have a question. This complex learning problem is solved using the backpropagation learning algorithm [10]. Backpropagation calculates the network error gradient as a change in network weight. Each layer of this multilayer neural network has a corresponding activation function. It is mainly divided into two parts: learning algorithms and applied or proven algorithms.



Schematic diagram of a three-layer neural network with direct connections.

Data on breast cancer in Wisconsin

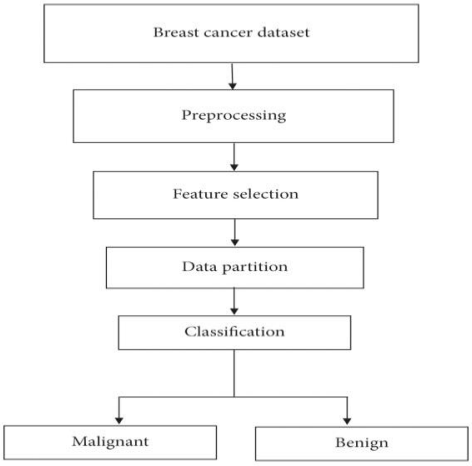
The dataset is split into 65% and 35% for training and testing, respectively. Thus, 444 records are used for training, and 239 records for testing. In the training dataset, 260 records are benign and 184 records are malignant. The test dataset consists of 184 benign entries and 55 malignant entries.

MATLAB was used to implement the backpropagation neural network. It uses a 64-bit operating system and a 2.53GHz Intel Core i3 processor with 2GB of RAM. In this post, we have set the learning algorithm to stop at 100 epochs.

Breast Cancer Diagnosis Using the IoT Network

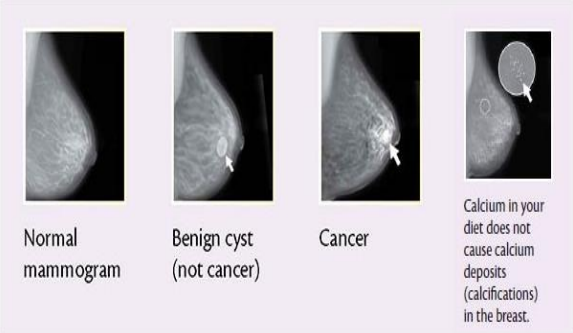
Cancer has become a deadly disease that many people suffer from. The program has been greatly influenced by the increase in the number of breast cancer patients, as studies show that 1 in 30 women will develop the disease during their lifetime. Then you are more likely to recover. In this way, the project lays the foundation for automated cancer detection, allowing more people to be diagnosed and treated faster.

There are clear indications that the quality and accumulation of microcalcifications are important for the early detection of breast cancer. They look like small white spots. It may or may not be related to cancer. The lumps can range from cysts (fluid-filled sacs) to benign hard masses, but can also be cancerous. A difficulty in diagnosing cancer is that abnormalities in normal breast tissue are difficult to distinguish due to their subtle appearance and indistinct edges. [15] This will help you find out. In addition, diagnosed cancers are classified into three categories: common, malignant, and benign.

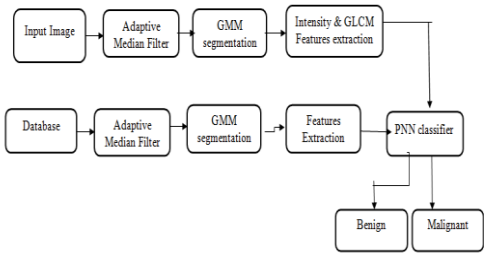


The neighbourhood size is configurable and can also be used as a comparison threshold. They are called impulse noise. [16,17] These noisy pixels are replaced by the average of neighbouring pixels that pass the noise encoding test.[18]

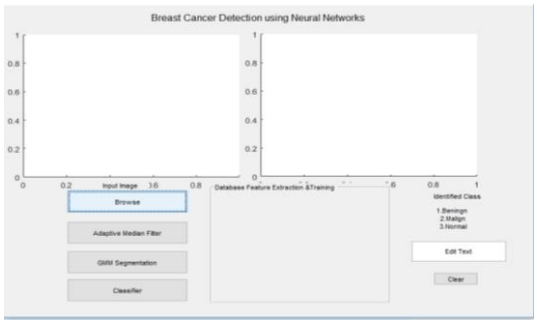
These images show the difference between malignant and benign breast tissue.



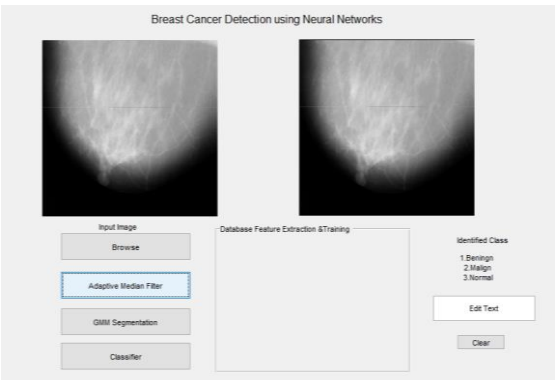
Block diagram

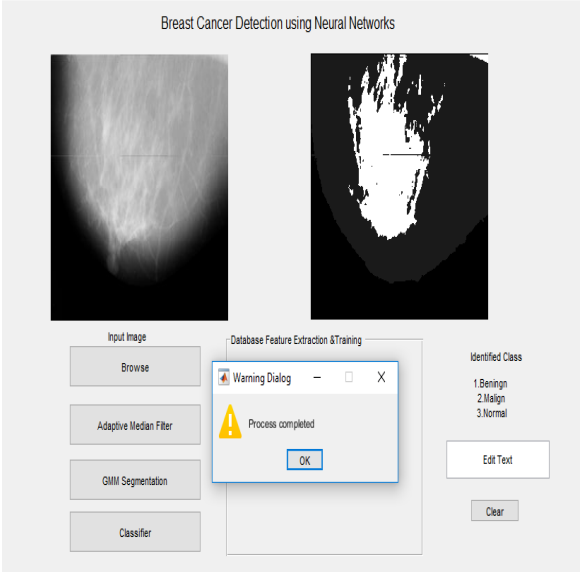


Open MatLab and run the tutorial, the GUI mode window will open. Please follow the instructions. Display the mammogram image and provide it as input.[19,20]



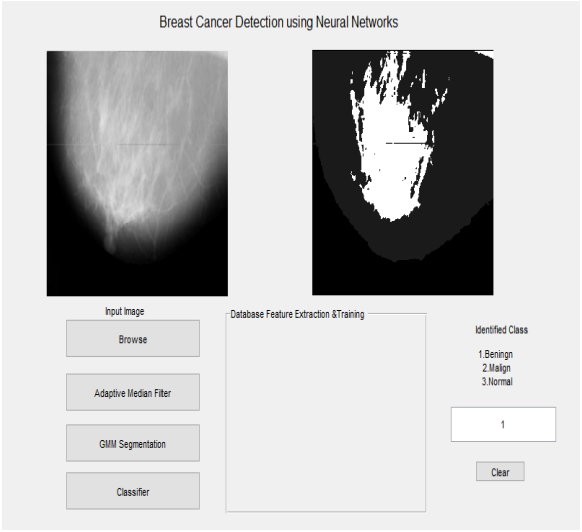
At this stage, adaptive median filtering is performed.





Part of HMM completed

sThis can be seen as the result on the right, indicating that the cancer is benign.



Conclusion

This study describes the application of IoT devices and how they can detect breast cancer. The main goal of this research is breast cancer detection using IoT big data processing. However, research is mostly focused on helping healthcare professionals and others diagnose the disease. The role of the Internet of Things has been explored. A total of 20 women were screened for early symptoms of breast cancer and specific factors (independent variables) known to cause breast cancer. Selected dependent variable: the probability of breast cancer.

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