

# A Literature Review on Thyroid Detection using Machine Learning

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## Abstract

The Thyroid gland is a vascular gland and one of the most important organs of a human body. This gland secretes two hormones which help in controlling the metabolism of the body. The two types of Thyroid disorders are Hyperthyroidism and Hypothyroidism. When this disorder occurs in the body, they release certain type of hormones into the body which imbalances the body's metabolism. Thyroid related Blood test is used to detect this disease but it is often blurred and noise will be present. Data cleansing methods were used to make the data primitive

enough for the analytics to show the risk of patients getting this disease. Machine Learning plays a very deciding role in the disease prediction. Machine Learning algorithms, SVM - support vector machine, KNN - K-nearest neighbours, Random Forest , K-Means Algorithms are used to predict the patient's risk of getting thyroid disease. Web app is created to get data from users to predict the type of disease.

**Keywords** - Hyperthyroidism , Hypothyroidism, SVM, KNN, K-Means.

## INTRODUCTION

The evolvement computational biology is used in healthcare industry. It allows collection of stored patient data for the prediction of the disease. There are prediction algorithms which are available for the diagnosis of the disease at early stages. The medical information systems are rich of datasets but there are only few intelligent systems which can easily analysis

the disease. Over a period of time, the machine learning algorithms have started playing a crucial role in resolving the complex and non-linear problems in the developing model .The Thyroid gland is an endocrine gland present in the human neck beneath the Adam's apple which help in secretion of thyroid hormone that influence the rate of metabolism and protein synthesis. The thyroid hormones are useful in

counting how briskly the heart beats and how fast we burn calories. The thyroid secretes two types of active hormones called levothyroxine (T4) and triiodothyronine (T3). These hormones help in regulating the body temperature. These also aid in energy-bearing and transmission in every part of the body and decisive in protein management. Iodine is considered as the main building block of the thyroid gland. It's prostrated in few specific problems. Undersupply of these hormones can lead to hyperthyroidism. There are many originations related to hyperthyroidism and underactive thyroids. There are various kinds of medications like thyroid surgery is liable to ionizing radiation, continual tenderness of the thyroid, deficiency of iodine and lack of enzyme to make thyroid hormones.

## LITERATURE REVIEW

A Literature Review is a comprehensive summary of previous research on Thyroid Detection Using Machine Learning. Here, we have demonstrated the knowledge and understanding of the following web application and related reviews. We have high lightened gaps that exists in research papers.

### [1] Ankita Tyagi, Ritika Mehra, Aditya Saxena

#### -Interactive Thyroid Disease Prediction

#### System Using Machine Learning Technique

The intent of our work to be done further is to cater the research of idiosyncratic techniques of machine learning that can be mobilized in the diagnosis of thyroid diseases. There are numerous approachable

analyses that are delineated and are being used in the latter years of adequate and competent thyroid disease diagnosis. The analysis shows that different technologies are used in all the papers showing different accuracies. In most research papers it is shown that neural network outperforms over other techniques. On the other hand, this is also given that support vector machine and decision tree has also performed well. There is no doubt that researchers worldwide have attained a lot of success to diagnose thyroid diseases, but it is suggested to decrease the number of parameters used by the patients for diagnosis of thyroid diseases. More attributes mean a patient has to undergo a greater number of clinical tests which is both cost effective as well time consuming. Thus, there is a need to develop such type of algorithms and thyroid disease predictive models which require minimum number of parameters of a person to diagnose thyroid disease and saves both money and time of the patient.

### [2] Chandan R, Chethan MS, Chetan Vasan and Devikarani H S

#### -THYROID DETECTION USING MACHINE LEARNING

Machine Learning algorithms, SVM - support vector machine, decision tree, logistic regression, KNN - K-nearest neighbors, ANN Artificial Neural Network are used to predict the patient's risk of getting thyroid disease. Web app is created to get data from users to predict the type of disease.

Web app is created to interface user and the trained model. Python Flask coding is used to create web app and html is used to design web page.

[3] Khalid Salman , Emrullah Sonuc

### -Thyroid Disease Classification Using Machine Learning Algorithms

Machine Learning algorithms like Support Vector Machines, Random forest , Naïve Bayes, Logistic Regression, k-Nearest neighbors are used. The accuracy of the algorithms used on our data changes with the change of the characteristics used in the data, as experience has demonstrated this clear change, which obtained the accuracy of the algorithms when three of the characteristics were deleted.

[4] Sindhya, Mrs K

### -EFFECTIVE PREDICTION OF HYPOTHYROID USING VARIOUS DATA MINING TECHNIQUES

It was observed that the accuracy of Naive Bayes algorithm increased the accuracy by 90.67. The highest precision of the MLP algorithm was 96.4 accuracy.

## Conclusion

The intent of our work to be done further is to cater the research of idiosyncratic techniques of machine learning that can be mobilized in the diagnosis of thyroid diseases. There are numerous approachable analyses that are delineated and are being used in the latter years of adequate and competent thyroid disease diagnosis. The analysis shows that different technologies are used in all the papers showing different accuracies. In most research papers it is shown that neural network outperforms over other techniques. On the other hand, this is also given that support vector machine and decision tree has also performed well. There is no doubt that researchers

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