

## Literature Survey

The thyroid gland is one of the body's most visible endocrine glands. Its size is determined by the individual's age, gender, and physiological states, such as pregnancy or lactation. It is divided into two lobes (right and left) by an isthmus (a band of tissue). It is imperceptible in everyday life yet can be detected when swallowing. The thyroid hormones T4 and T3 are needed for normal thyroid function. These hormones have a direct effect on the body's metabolic rate. It contributes to the stimulation of glucose, fatty acid, and other molecule consumption. Additionally, it enhances oxygen consumption in the majority of the body's cells by assisting in the processing of uncoupling proteins, which contributes to an improvement in the rate of cellular respiration. Thyroid conditions are difficult to detect in test results, and only trained professionals can do so. However, reading such extensive reports and predicting future results is difficult. Assume a machine learning model can detect the thyroid disease in a patient. The thyroid disease can then be easily identified based on the symptoms in the patient's history. Currently, models are evaluated using accuracy metrics on a validation dataset that is accessible.

With recent technological advancements in data processing and computation, machine learning and deep learning techniques have been used in several research studies for thyroid disease prediction. Prediction of this disease at its early stages and its classification into Hypothyroidism, or Hyperthyroidism is helpful for timely treatment and recovery. The literature survey is performed using peer-reviewed article databases such as google scholar and Scopus. The searches were performed within the scope of the last five years to identify the recent works in our study. The keywords "Thyroid disease", "machine learning", and "deep learning" combinations were used to select the relevant articles. Machine learning and deep learning methods are used for thyroid disease detection .