CHAPTER -7
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CONCLUSION & SUMMARY

7.1 SUMMARY & OVERVIEW

Thyroid diseases are the most common diseases. Since, TDA are uncertain data, missing attribute values and continuous features, the RST treat these problems in the dataset. Moreover, the modified similarity analysis relation is used to classify rules which contain missing attribute values or gaps, with respect to the number of the whole defined attributes for each rule. A reliable learning method and analytical studies for diagnosing TD is presented, which can be used by doctors for medical diagnose. Indeed statistical results show that this evolutionary classification algorithm is the best in reducing size, time, attributes and helps in increasing accuracy for the datasets customized and openly available.

Demographic data in particular towards thyroid disease shows its major effect on women compared with men or child as mentioned in Chapter 1, Section 1.3.1 & 1.3.2. This is because of the attribute values which enforce the rate of effect on the human body based on its location or area. The well-known signs and symptoms of hypothyroidism tend to be more subtle than those of hyperthyroidism in India are dry skin, cold sensitivity, fatigue, muscle cramps, voice changes and constipation are among the most common, which comparatively differs from West. Less commonly appreciated and typically associated with severe hypothyroidism are carpal tunnel syndrome, sleep apnea, pituitary hyperplasia that can occur with or without hyperprolactinemia, galactorrhea and hyponatremia are mostly suble both in West and India that can occur within several weeks of the onset of profound hypothyroidism specifically not related with location or area.

Although, for example, in the case of some symptoms i.e., the attribute values such as voice changes subjective and objective measures differ. Several rating scales have been used to assess the presence and, in some cases, the severity of hypothyroidism, but have low sensitivity and specificity.
While the exercise of calculating clinical scores has been largely superseded by sensitive thyroid function tests using TSH, TT4 and FTI attributes of thyroid datasets, it is useful to have objective clinical measures to gauge the severity of hypothyroidism, which is performed and evaluated in this thesis work. Early, as well as recent studies strongly correlate the degree of hypothyroidism with relaxation time, a measure rarely used in current clinical practice today which could be used for classification as stated in Chapter 4

7.2 OVERVIEW OF MAJOR FINDINGS

In this experimental study on thyroid using RM, has given good prophecy. RST with MSR achieved good results with MLA, but still it consists of unsatisfied accuracy. This proposed method used the class information entropy of candidate or patients for selecting the bin boundaries. Moreover, the missing attribute values are treated based on computing the information gain by dropping an attribute, and then SR is measured. Hence, the hybrid architecture system developed including RST & MLA achieved an accuracy level for predicting the disease levels which reached at most 99% to 100% optimistic levels for the given data sets as related in Appendix I.

RM of MLA is considered for evaluating the performance in terms of DF in predicting TD. The attributes for UCITD data which range from S1 to S28 are crucial in deciding TD status, with the selected data. Improvised LASSO is found giving better results with all the features available. When the observations turned towards results, it is observed that there is a growth rate of values as measured as observed in Appendix II. As per the results obtained, it can be recommended that LASSO related to RM shows high performance rate in comparison with RRA.

The efficiency in the parameters chose the best classification algorithm which can lead to exact prophecy of TDD. Successful implementation i.e., (i) introduced all 28 pristine attributes along with its values for predicting TDD, (ii) comparison of two high flying algorithms belonging to same cadre of MLA are applied on common featured attributes of UCITD, which merely helped in obtaining predicting levels at 98.99% accuracy. Lastly,(iii) about 2096 tuples of data for predicting TD is showcased in Appendix II.

MLA has been proved very useful for pre-processing steps to remove unwanted features and to resolve the missing data. Most importantly, this experimental study showed more improved accuracy over the original data set with missing values.
In this study, popular classification algorithms were considered for evaluating their classification performance in terms of decisive factors in classifying thyroid patient’s dataset.

Further the study is made as a comparative analysis of the common attributes of both IETD and UCI datasets and the experimentation to evaluate the performance of the classification variable is deployed.

However, the results with IETD dataset could be attributed to the limited number of samples compared to UCITD dataset due to lack of relevant features, but the variance calculations and significance constant proved that, there is a variation in the significance to large extent within the group (§) compared as well as between the groups (¥) of ANOVA.

The successful implementation & completion of this work can give young researchers the idea, how useful the “MLA” is in prediction and also the benefits of its application in medical epoch.

The implications in the entire scenario results in the improvement in classification from 80% to 93%, explained as in detail within Appendix III. This classification accuracy makes the classifier related result more clinically significant which confirms the difference in thyroid patients of West and India.

Results of this study is very important while developing an expert advisory medical diagnosis systems as it corroborates the necessity of localization of the software based on the geographical region. Also, thyroid specialists to be aware about these geographical differences among thyroid patients and prescribe any drugs accordingly.

7.3 LIMITATIONS FOR FINDING(S)

- Classification of all TDDs is not performed; generally all the proposed activities stop at hypo, hyper and illness but in this work we classified major 8 categories of thyroid disease through open datasets and customized datasets.
- Comparing IETD and UCITD datasets, the grouping comparisons are made 10, for the common attributes of both.
- Eighty percentile of clinically significant datasets are available in open platforms for classification, which inspired us to gather the new data sets in our area and locally related hospitals authorized by the concerned doctors, in which we succeeded.
• Testing sensitivity of algorithm varies because of the challenging attributes which are considered based on geographical settings.
• Missing values or inconsistent datasets disqualifies the original TDD.

7.4 OPEN QUERIES, THE FUTURE RESEARCHERS CAN ADDRESS

• Predict the target thyroid function for hypothyroid patients on TSH or T4U attribute value using a famous mathematical model like vapnik chevronenikis theory ,etc.,
• Analyze the long-term outcomes of different target TSH levels on levothyroxine replacement attribute values using deep learning algorithms inducing base attribute values.
• Analysis of different age groups having different target TSH levels by grouping the decisive factors obtained at each level.
• Ought individuals to be assessed for determining their personal TSH reference range for future diagnosis and treatment of thyroid dysfunction using computer vision techno stats.
• A critical study on FT3 or FT4 grouping ratio using an optimal classifier providing additional information about thyroidism in patients not restricting to less than three classes and specified attributes for classification.

7.5 FUTURE SCOPE

In this era of modernization everything is online. In this busy world the human being is packed with several works which he or she had to perform in a short span of time and at the same time he/ she should be in a position to think about his / her health. The automated expert system gives the feasibility to know the status at the primary levels of the disease stage.

The ES developed now, suggest him / her about the nearby referral source and sometimes it produces the curing or prevention strategies. In future this ES will be developed by using MLA, optimization algorithms which is used in identification of deeper diagnose. The ES would be designed with combination, either of other technologies which can consider hundreds or thousands of features either one by one or in groups to give the exact status of the disease prediction.
The field of computation science along with medical science can do miracles just because of the rapid growth of computing power capabilities. The future scope of diagnosing all kind of diseases and information of drug dictionary can also be a part of the ES.

The scope of this work could be a comparative study made on different geographical locations.

The expert advisory system are being developed in the present running world to serve the needs of human kind by reducing their time and cost, where the features and the number of attributes are readily increasing. The use of dimensionality reduction methods for further evaluation or optimization of the data can help in developing more reliable ES.
APPENDIX
APPENDIX

USER MANUAL

The work “THYROID DISEASE DIAGNOSIS USING MACHINE LEARNING ALGORITHMS- SOME STUDIES.” is a Java enabled web application, developed using Java Server Pages and MySQL Database.

APPENDIX I: THYROID DISEASE DIAGNOSE SPRINGER ( SOCO )


APPENDIX II: IMPROVISED PROPHECY ELSEVIER ( PMU )


APPENDIX III: COMPARITIVE STUDY ( IRJET )