

Oral Cancer Detection using Machine Learning

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Abstract - Before cancer was an irremediable disease but now the improvement in technology has made it curable if it is detected in early stages. Oral cancer is indomitable increase in the number of cells which has the capability to affect its neighbor cells or tissues. In spite of having various advancement in fields like radiation therapy and chemotherapy the death rate is relentless. Therefore early detection of cancer is important. In this paper we are using Machine Learning as domain which makes capable of considering the datasets of a victim. Then it will be classified using apriori algorithm. We are developing a health sector application which also makes use of Data Mining and data extraction for prediction techniques, classification rules for oral cancer prediction and uses association rules to find the relationship between the oral cancer attributes.

Key Words: oral cancer detection, data mining technique, association rule mining, apriori algorithm.

1. INTRODUCTION

Cancer has been characterized as a heterogeneous disease consisting of many different subtypes. The early diagnosis and prognosis of a cancer type have become a necessity in cancer research, as it can facilitate the subsequent clinical management of patients. Therefore, these techniques have been utilized as an aim to model the progression and treatment of cancerous conditions. In addition, the ability of ML tools to detect key features from complex datasets reveals their importance. The predictive models discussed here are based on various supervised ML techniques as well as on different input features and data samples. Given the growing trend on the application of ML methods in cancer research, we present here the most recent publications that employ these techniques as an aim to model cancer risk or patient outcomes.

1.1 EXISTING SYSTEM ANALYSIS

Oral cancer is one of the major diseases and it needs to be identified in the early stages. There is no automation for Oral Cancer Prediction and discovering the relationship between oral cancer and its attributes is tedious task and challenging. In existing we have many health maintenance tools and software. All these tools are used to store the data and retrieve the same data but no analysis is done. Today's medical field requires extraction of useful information from the analyzed data.

Limitations of existing system

- No automation for oral cancer prediction
- Completely manual process
- Time consuming
- Doesn't predicts the association among oral cancer and its attributes
- Lack of user satisfaction

1.2 PROPOSED SYSTEM ANALYSIS

To overcome the different drawbacks and issues mentioned in the existing system we develop automation for the "oral cancer prediction" and finding the association among different attributes. Proposed system is a health sector application where the major objective is to predict the oral cancer disease in early stages. Proposed system makes use of data mining & data extraction for prediction techniques "classification rules" for oral cancer prediction and uses "association rules" to discover the relationship between the oral cancers attributes.

Proposed system is the medical sector application. This system helps to predict of oral cancer, based on manually inserted inputs. Inputs are like patients age, clinical symptoms, diagnosis, diagnosis symptoms etc. and produces result as an output. Output is consisting either patient has Oral cancer or not.

In the proposed system, the neural networks approach the oral cancer problem in a different way. The idea is to take a large number of datasets of existing patients, and then develop a system which can learn from those training and can predict the oral cancer for the patients for the new entries of data made for the patients.

2. METHODOLOGY

Presently, no effective tool exists for early diagnosis and treatment of oral cancer. Here, we describe an approach for cancer detection and prevention based on analysis using association rule mining. The data analyzed are pertaining to clinical symptoms, history of addiction, co-morbid condition and survivability of the cancer patients. The extracted rules are useful in taking clinical judgments and making right decisions related to the disease.

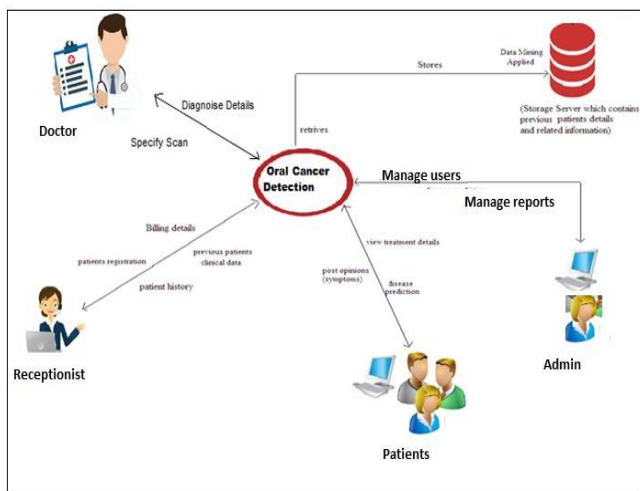
Association Rule Mining

Data mining technique, association rule mining is applied to search the hidden relationships among the attributes. It identifies strong rules discovered in databases. Thus, an association rule is a pattern that states when X occurs, Y occurs with certain probability. In this paper, we adopt the standard definition of association rules.

Apriori Algorithm

The apriori is a classic algorithm for frequent item set mining and association rule learning over the transactional databases. It proceeds by identifying the frequent individual items in the database and extending them to larger and larger item sets as long as those item sets appear sufficiently often in the database. The frequent item sets determined by a apriori can be used to determine association rules, which highlight general trends in the database. Association rules mining using apriori algorithm uses a “bottom up” approach, breadth-first search and a hash tree structure to count the candidate item sets efficiently [6].

3. MODULES DESCRIPTIONS



- ▶ **Admin Module:** Admin has full control on this system.
 - Home page: Admin will login using user id and password. The admin is the one who can add authorized doctors, patient and receptionists.
 - Manage user’s page: Admin will manage the users by deleting them.
 - Approve user’s page: Admin will approve the new users for this application once they have registered to the application.
 - Load data page: Admin will upload the old data to the database.
 - Processing the algorithm page: Admin can process the algorithm along with the data for the result.

- Graph page: Admin can give the overall graph considering all the old stages.
- Log-out: By clicking Log-out button Admin page is redirected to home page.
- ▶ **Doctor Module:** Doctor is the one who predicts disease for new patients using the oral cancer prediction application.
 - My appointment page: In this page the doctor see the appointments allotted to him.
 - Cancel appointment page: In this page the doctor can cancel his appointments.
 - Patient diagnosis page: In this page the doctor takes the new patients details for predicting the cancer.
 - Log-out: By clicking Log-out button doctor page is redirected to home page.
- ▶ **Patient Module:** Patient is the one who can post their symptom details so as to predict the disease he/she might be suffering from. Only registered patients can use the system.
 - My appointment page: In this page the patient see the appointments allotted to him.
 - Cancel appointment page: In this page the patient can cancel his appointments.
 - Log-out: By clicking Log-out button patient page is redirected to home page.

4. CONCLUSIONS

Oral cancer is the sixth most commonly occurring cancer malignancy in the whole world. Data mining technique, association rule mining is applied to search the hidden relationships among the attributes. It identifies strong rules discovered in databases. Thus, an association rule is a pattern that states when X occurs, Y occurs with certain probability. In this paper, we adopt the standard definition of association rules.

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