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Detecting and Preventing Ulcerative Colitis samples using efficient feature selection and using Machine Learning

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Abstract

Inflammatory bowel disease is one of the chronicle diseases which is the severe cause for the human life. It affects more than 20 million people across the world. According to the medical statement; it is treatable and nor curable because the UC patient will take the medicine for a long time. Chronicle disease may affect the all the part of gastrointestinal tract, from the mouth to the anus. UC is involving in large intestine to rectum whereas inner most layer of the intestine. UC may occur in the part of Colon or Large Intestine. Even though, medicinal experts will examine from the mouth to anus with different testing parameters like endoscopy, colonoscopy, X-ray and blood tests. Since Ulcerative Colitis is not confined with any parameters or it is not fully understood. Convergence of medical records the following three are the major cause for UC

1. Genetic predisposition
2. Immune System Disturbance
3. Environmental triggers

Researchers have been looking at dozens of genetic changes that may be involved in UC. They still don't know how these changes trigger the disease, but they have a few theories. Some of the genes that have been linked to UC are associated with the body's ability to produce proteins that form a protective barrier on the surface lining inside the intestine

Ulcerative Colitis is one of the Irritable Bowel Syndrome which affects the digestive system of the human body in all the aspects. Like swelling, less appetite, hemoglobin loss, diarrhea, constipation, rectum pain and bleedings are the major records from the gastroenterologist medical history. We are from Computer Science field, so we tend to inculcate this problem into our Machine Learning techniques to prevent from the Ulcerative Colitis decease. We incorporate with ensemble learning analogies with different aspects and conclude with optimum solution. . In our traditional medical systems are not feasible for this problem. Hence we have to contribute some patient personal history with medical records. We think that we may to implement ensemble SupportVectorMachine, DecisionTree, KNearestNeighbour are the three Machine learning algorithms for obtaining the betterment of result

Introduction

One of the chronic diseases that seriously endangers human life is inflammatory bowel disease. Over 20 million individuals around the world are impacted by it. Because the UC patient will take the medication for a long period, the medical statement states that it is treatable but not curable. From the mouth to the anus, the gastrointestinal tract can be affected by Chronicle [1] illness. The innermost layer of the intestine is affected by UC while the big intestine extends to the rectum.

- Oral Cavity
- Esophagus
- Liver
- Stomach
- Small Intestine
- Terminal Ileum
- Large Intestine/Colon
- Rectum
- Anus

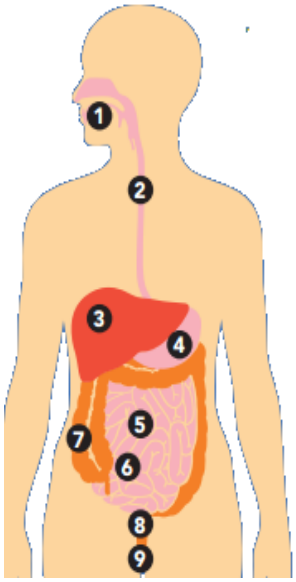

Figure 1.1: The Digestive System

The human gastrointestinal system is shown in figure 1.1. UC can affect the large intestine or the colon. Nevertheless, medical professionals will conduct examinations from the mouth to the abdomen using various testing techniques, such as endoscopy, colonoscopy, X-rays, and blood tests. Since ulcerative colitis is not fully understood or is not limited by any parameters. Convergence of medical records, the three factors listed below, and UC

Implementation

We used colonoscopy footage and patient data to construct a novel framework with ensemble learning and train the network. From the data, we retrieved features in this. All the colonoscopy and patient record components' normal values were assessed, entered into decision trees, K-nearest neighbours, Naive Bayes, and support vector machines, and then analysed. For certain situations, these four different algorithms are the best. The main goal of ensemble learning is to achieve the greatest performance possible across all test settings.

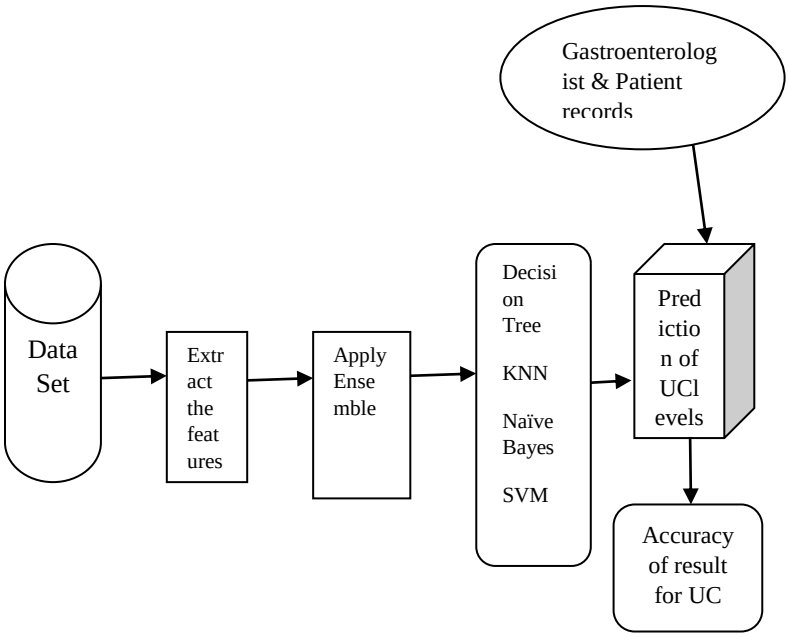

Figure 2. Architecture diagram

UC problems and its causes are different for human being so we split the video into frames with 128X128 pixels. So experts can diagnose the problem in easier way and it paves the precaution for the patients. We used python modules for converting video into n number of frames. In this forum, it can accept .MP4, .AVI, .MPEG file format

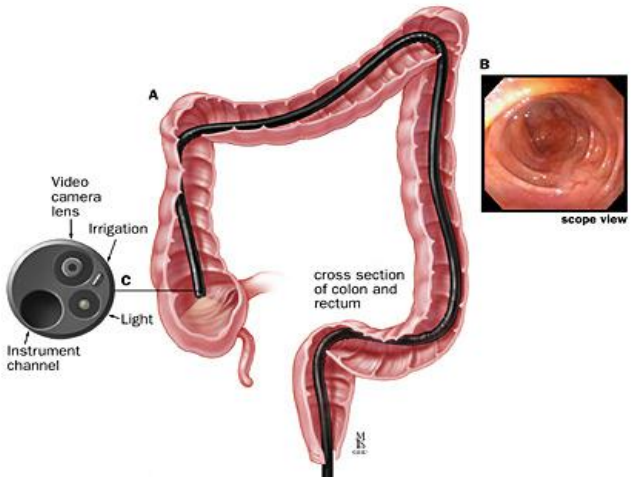

Figure 3 Colonoscopy Test procedures

Colonoscopy is the next level of x-ray which is used to take analysis of large intestine. It is very safe method for detecting the UC for a human body. Here some of the samples for colonoscopy images

a. Terminal Ileum

b. Terminal Ileum

c. Retroflexion

d. transverse colon

Dataset

Sample	SMOKER	DIAGNOSIS	SEX
GSM901353	No	ulcerative colitis	male
GSM901352	No	ulcerative colitis	female
GSM901352	No	ulcerative colitis	female
GSM901352	No	ulcerative colitis	female
GSM901353	No	ulcerative colitis	male
GSM901353	No	ulcerative colitis	male
GSM901352	No	ulcerative colitis	female
GSM901353	No	ulcerative colitis	male
GSM901353	No	ulcerative colitis	male
GSM901353	No	ulcerative colitis	male
GSM901352	No	ulcerative colitis	female
GSM901352	No	ulcerative colitis	female
GSM90134	Yes	ulcerative colitis	male
GSM901353	No	ulcerative colitis	male
GSM901352	No	ulcerative colitis	female
GSM901338	No	Crohn's disease	male
GSM901338	No	Crohn's disease	male
GSM901338	No	Crohn's disease	male
GSM901335	No	Crohn's disease	female
GSM901335	No	Crohn's disease	female

Conclusion

This research will be practical and relevant to everyday living. Because this disease affects 41% of people worldwide. By deploying our IT features to the world, we can tackle this issue with the help of patient histories, guidelines, and reports from gastroenterologists. The research on UC-related medical data mining applications with diagnosis systems was only provided by a few number of researchers. Even though many of the methods for UC have previously been contributed, we used ensemble learning because the underlying reason of this particular case is not the same for all of the patients. We created the KNN, SVM, and decision tree algorithms as a result. According to the results of the poll, the decision tree is a little bit quick for text-based results but not the best for results based on images. Using a support vector machine.

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BIOGRAPHIES

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