First model with 73%accuracy

Early detection of colorectal cancer using machine learning & deep learning

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Project logo

Abstract

Colorectal cancer (CRC) begins in the colon or the rectum. These diseases can likewise be called colon malignant growth or rectal cancer, contingent upon where they start. Colon malignant growth and rectal disease are regularly assembled in light of the fact that they share many highlights practically speaking. Colorectal disease is second reason for death in many communities additionally early conclusion have a more prominent possibility of survival. So colonoscopy represents a very important diagnostic modality for screening for colorectal cancer, we address a current issue in medical picture handling, the discovery of colorectal disease from colonoscopy videos. As per overall malignant growth measurements, colorectal disease is perhaps the most well-known disease. The most common way of screening and the expulsion of pre-malignant cells from the digestive organ is an essential undertaking to date. The traditional manual process is dependent on the expertise of the medical practitioner. We have Two phases in this project The first stage we utilized SVM model with an accuracy of 87 % in second stage we utilized deep learning CNN models with some accuracies.so, The main objective of this project is early detection of colon cancer based on medical image processing extracted from colonoscopy videos.

Introduction

Cancer is Billions of cells wear out or get damaged. Each time a cell is destroyed, the body makes an entirely new cell to replace it, in an effort to create a cell that is a perfect copy of the cell that was destroyed

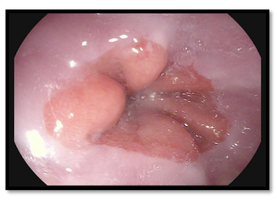
CRC starts when the process of the normal replacement colon lining cells deviate. Health care professionals are certain that colorectal cancer is not contagious (a person cannot catch the disease from a cancer patient). Some people are more likely to develop colorectal cancer than others

Symptoms is (Blood in stool ,Abdminal pain, Fatigue ,unexplained)

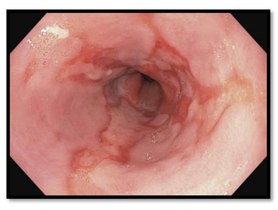
Factors is (Age,Racs, Diet and colorectal cancer, Inherited syndromes, A sedentary lifestyle, Diabetes, Obesity, Smoking, Alcohol, Radiation therapy for cancer)

there is 4 stages of CRC

Z-line



Esophagitis



Pylorus

Polyps

Cecum

Ulcerative Colitis

Methods

Dataset contain 6000 images from three anatomal landmark each landmark has 1000 for normal case and 1000 for cancer case

Removing Non_releated shape from images

Bluring the images

Drawing contours on RGB images

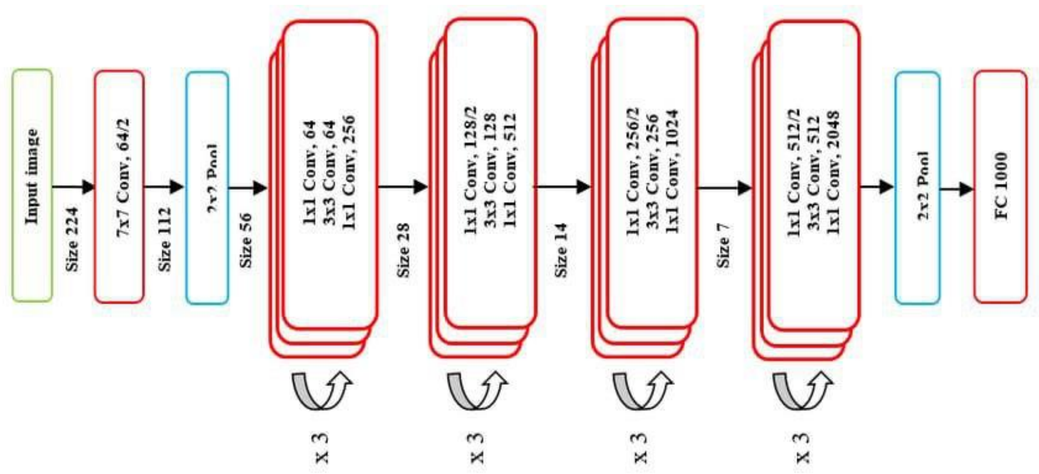
Flatten images

Split the data into train and validate and test with Shuffle and it was used to build the model

Classifying images using different calssifiers

Phase one model using supervised technique (SVM) with 87% accuracy

Phase two models using different architectures of CNN the highest accuracy is 93% with RESNET50



Primarily Design

Conclusion

➢ It is expected that, the usage of the model would raise the survival rate of CRC patients and decrease the number of casualties as CRC has been detected in early stages.

➢Given the aforementioned models (three specialized models VS on general model).

➢It was foreseen that three specialized models is more accurate than a general model as each specialized model focuses only on pathological finding with its corresponding anatomical landmark.

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