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A Hybrid Approach Using Particle Swarm Optimization and SVM for Detection of Kidney Lesions from Abdominal CT Scan Images

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ABSTRACT: The Computed Tomography (CT) technique is mostly used by radiologists for reliable detection and diagnosis of disease. In last few years so many people are suffering from kidney tumours. The kidney tumours are found in early stage, by proper treatment the patient may recover. An efficient tool is required to analyse the large images which contains heavy information for disease diagnoses and treatment. Using Segmentation unusual masses (kidney lesions) can be detected from abdominal CT scan images. The accuracy is depends on feature selection and classification technique used. There are number of models proposed in literature, but there is no unique model consistently and effectively predicting kidney lesions. Accurate kidney lesions detection is a challenge in the Medical Image Processing. In this article an intelligent hybridization approach through Particle Swarm Optimization (PSO) and Support Vector Machines (SVM) for detection of Kidney Lesions from Abdominal CT Scan Images. The SVM is used for efficient classification and PSO for efficient optimized parameters. The experimentation and simulation is done in MATLAB with Computed Tomography (CT) kidney data set on the proposed model. The performance analyses is done on the proposed model for accuracy prediction. It is observed that classification accuracy has improved in proposed model using PSO and SVM.
Keywords : Computed Tomography, kidney lesions, Segmentation, Particle Swarm Optimization, Support Vector Machines

I. INTRODUCTION

This section describes the fundamentals, terminology and, techniques used forDetection of Kidney Lesions from Abdominal CT Scan Images.

Image Processing is a set of mechanisms that are employed to enrich the quality of image. Digital image processing approaches are tremendously employed in medical filed for diagnosis of various diseases or abnormalities, which is known as Medical Image Processing. The Medical Image Processing techniques help the doctors to analyse the various abdomen related diseases. Medical image analysis reports are given by radiologists and they take help of various medical imaging modalities like CT - Computed tomography, MRI - Magnetic resonance, US - Ultrasound, other nuclear imaging approaches that involve PET- Positron Emission Tomography and SPECT - Single Photon based Emission Computed Tomography for the analysis of abdomen diseases. The imaging techniques also help radiologists in identifying the exact location, size and type/grade of the disease.

Every human being have two kidneys of fist size, bean shaped vital organs present on both side of the human spine at the lowest half close to rib cage. Both the kidneys possess at least a million functioning units, that are known as nephrons. They discard the unwanted contents like, excess fluids from the body through the urine and it also produces certain hormones that reproduce the generations of red blood cells, controls blood pressure, hold the calcium metabolism, etc. The kidneys also synchronize the level of chemicals in the blood. Most common kidney disorders are caused due to masses formed in the kidneys. The kidney masses are associated with abnormality such as Cysts, Angiomyolipoma (AML) and RCC tumors and these are also known kidney lesions. These lesions do not give any symptoms most of the times. These masses are accidentally detected during a normal CT scan.

The Images are having noise, is induced in to the CT scan images due to then CT artefacts, improper focus, motion etc. Some of the common noises in CT images are susceptible to Salt and Pepper noise, Speckle noise, Gaussian noise. Image processing approaches that canenhance the quality of the medicalimage. The resultant of the next phase of image processing is highly dependent on the image quality and thus is a significant

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Evaluating Frequency of words and Word Cloud from Astrological sentiments using NLP

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ABSTRACT

The identification of interest/disinterest over a notion is having a huge demand in the current competitive data analytical world. For example, the customer preferences in various seasons, approximate visitors to a tourist place based on scenarios like weather and special occasions in the place, and so on. While giving an opinion on any concept, natural language in form of sentences/words/symbols/ratings plays a vital role. Depends upon the context and usage of natural language, captured opinions can be interpreted as either in a positive or negative sense. The terminology used for providing the opinions is used for analysing the data in an easy way. The evaluation of the word frequencies and word cloud are identified accurately, only after a keen analysis of the collected opinions.

The Term-Document Matrix is one of the techniques that identify the frequency of words in each and every document/row in the given dataset, which can be used to generate the word cloud. In this paper to identify the frequency of words from the opinions given by multi-domain personalities on Astrology, distinct Natural Language Processing (NLP) techniques are used. A word cloud can also be generated from the set of words used for the astrological dataset.

Keywords : Natural Language Processing, Astrology, Word Cloud, COVID-19, Knowledge Management System, Parsing.