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Patent Search

Invention Title	ARTIFICIAL INTELLIGENCE BASED AUTOMATIC HEALTHCARE MANAGEMENT SYSTEM FOR DETECTION AND PREVENTION OF PANCREATIC TUMORS USING MULTI DETECTOR COMPUTED TOMOGRAPHY, IMAGE PROCESSING AND MACHINE LEARNING ALGORITHMS
Publication Number	47/2023
Publication Date	24/11/2023
Publication Type	INA
Application Number	202341067236
Application Filing Date	06/10/2023
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	BIO-CHEMISTRY
Classification (IPC)	G01N0033574000, G16H0050200000, C12Q0001688600, G16H0050300000, A61B0006000000

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Abstract:

Artificial Intelligence based Automatic Healthcare Management system for detection and Prevention of Pancreatic Cancer using Multi detector Computed Tomograph processing and Machine Learning algorithms

ABSTRACT: Pancreatic cancer exhibits the highest mortality rate among diseases, as seen by a mere 11% five-year overall survival rate. Patients with pancreatic cancer who receive an early screening diagnosis have a median overall survival period of around ten years, in contrast to a median survival of 1.5 years for those who do not undergo early screening. Hence, the timely identification and prompt intervention of pancreatic cancer hold significant importance. However, the diagnosis of pancreatic cancer is a challenge due to its rarity, which results in expensive screening costs. Additionally, the current tumor markers lack sufficient accuracy, and the choice of treatment options remains uncertain. Artificial intelligence technology has the potential to facilitate early diagnosis by efficiently identifying high-risk groups using various means such as medical imaging, pathological examination, biomarkers, and other relevant factors. This can aid in the timely detection of pancreatic cancer lesions. Simultaneously, the utilization of artificial intelligence algorithms can also facilitate the prediction of survival duration, recurrence likelihood, metastatic potential, and efficacy, all of which have a significant impact on the overall prognosis. Moreover, artificial intelligence (AI) is extensively employed in the management of pancreatic cancer, including the analysis of medical records, the estimation of medical imaging parameters, and the development of computer-aided diagnosis systems, among other applications. The successful implementation of AI applications in the field of pancreatic cancer necessitates a collaborative endeavor involving doctors, basic scientists, statisticians, and engineers. Despite certain limitations, the significant computational capabilities of this technology are expected to be essential in addressing the challenges associated with pancreatic cancer in the near future.

Complete Specification

Description: DESCRIPTIONS

Pancreatic cancer (PC) is considered one of the most lethal and aggressive malignancies affecting the gastrointestinal tract. This particular kind of cancer has earned the moniker of the 'king of cancer' owing to its highly aggressive nature, propensity for invasion and quick spread to distant sites, as well as its unfavorable survival rate and prognosis. In recent years, there has been a notable increase in the prevalence of pancreatic cancer worldwide. This rise has been predominantly attributed to various factors including advanced age, alcohol consumption, tobacco use, a sedentary lifestyle, obesity, chronic pancreatitis, diabetes, genetic predisposition, prolonged exposure to environmental pollutants in air and water, as well as an unhealthy diet and lifestyle. Surgical procedures have traditionally served as the primary treatment strategy for individuals in these patient populations. Nevertheless, the disease has been primarily identified at advanced stages because of the lack of distinct clinical signs and molecular markers, rendering surgical interventions useless. Hence, the timely identification and precise classification of different stages of pancreatic cancer play a crucial role in enhancing therapy efficacy. The diagnosis of pancreatic cancer poses significant challenges due to the anatomical characteristics of the pancreas, which is located deep within the retroperitoneal space and is surrounded by intricate structures. The pancreas is surrounded by a highly vascularized environment, which enables pancreatic cancer cells to metastasize quickly, contributing to the aggressive nature of pancreatic cancer. Pancreatic cancer commonly presents with a range of symptoms, including abdominal discomfort, alterations in fecal consistency, nausea, bodily bloating, co-occurring conditions such as diabetes and jaundice, altered liver function parameters, and weight loss, among others. Typically, these symptoms manifest prominently only in the later stages of the disease and are frequently overlooked in its first phase. Moreover, it should be noted that serological markers utilized for the detection of pancreatic cancer, such as CA-19-9 (Carbohydrate antigen), exhibit limited specificity and sensitivity. Consequently, reliance on these markers may contribute to an elevated risk of mortality for those affected.

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