Enhancing Medical Care Systems and Services in UAE through Artificial intelligence

(Executive Summary)

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1. Introduction

Lung cancer is one of the malignant tumors with the highest mortality rates and incidence in the world. It is the leading cause of cancer-related deaths worldwide with poor survival in the absence of early detection methods. The 5-year survival rate for people diagnosed with lung cancer was merely about 2% primarily due to the fact that 70 % of these patients are already in the advanced stages of the disease when they are diagnosed and have few treatment options only. Therefore, intelligent medical diagnosis mode has become an increasingly important development trend in the early diagnosis and treatment of lung cancer. This project uses various types of Artificial intelligence (AI) techniques to develop a smart application and models for early detection of lung cancer. AI will be integrated properly with other systems to make significant progress in early screening, pathological diagnosis & prognosis assessment, of lung cancer. In other words, we elucidate the value of AI and other smart applications for early detection and precise treatment of lung cancer.

2. Research Objective:

The main objectives of this project are to

i. Develop a smart application that can help UAE health care providers and authorities in early and timely detection, diagnosis and prognosis of lung cancer before it spreads or even before it forms.

ii. Help UAE health care formulate an effective strategy & treatment plan for patients leading to higher rate of survival.

3. Research Question(s)

Can Artificial Intelligence Help Predict Lung Cancer in New and Better Ways.
What are the values of AI in developing a smart and accurate Model for Early Detection of Lung Cancer"

4. Research Methods

- Approach:
  This project uses a two-stage methodology as follows:
  The first stage is developing an incorporative Artificial Intelligence and Machine Learning (AI/ML) tool/model for early detection of lung cancer based on the state of art and recent research advancement in relevant areas.
- The second stage is employing data mining techniques to build a mart application, using several data points over a patient's diagnostic and treatment, radiomics, and tumor characteristics to help clinicians provide individualized care to patients. Data mining can help analyze and classify information and patients and suggest treatment plans supporting doctors to make informed decisions and choose the most appropriate treatment protocols for patients).

5. Key Findings

The project demonstrated that the integration of multiple features of AI with data mining is a promising novel method for predicting cancer disease and increase overall survival. This will further revolutionize cancer research and disease treatment in UAE health care sector and improve health care providers' capabilities for correct and timely identification of lung cancer,, preventing delayed diagnosis and treatment, and leading to better healthcare outcomes in UAE and saving more lives.

6. Implications

The project is expected to make significant impacts on UAE health care as health care authorities and stakeholders including physicians, doctors and leaders can formulate smart national strategy for early detection of lung cancer before it spreads or even before it forms at all. Our proposed application offers the potential to support drug development to screen previously developed drugs and identify potential drug for further investigation.

7. Conclusion

AI and ML with other applications will further revolutionize cancer research, diagnosis, and treatment through their analytical and utilization of big cancerous research data and health care. This can improve health care providers' capabilities for correct and timely identification of lung cancer and enhance diagnosis and treatment process leading to enhancing wellbeing and saving more lives. AI and ML can help streamline treatment process and workflows by automating real-time detection systems and approaches, leading thus to more cost efficient and enlarged benefits for UAE government, community, and health care authorities in managing cancer disease and improving community wellbeing .