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Review: Mathematics and AI in Biological Disease

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Abstract

In this project, we want to establish a technique which can be used to identify the disease through AI and ML. We will use mathematical modeling to find out governing equation of the disease. We will apply suitable numerical or analytical methods to find out exact or approximate solution of the governing equation with the help of suitable initial and boundary conditions. Though the use of Artificial intelligence, Machine learning, Mathematical modeling and Numerical analysis, we can reduce the infection ratio and death ratio in the humans.

Keywords: Artificial intelligence; Machine learning; Mathematical modeling; Governing equation; Numerical method

Introduction

Artificial intelligence (AI) is branch of computer engineering like other branches, which include coding theory, numerical methods, and hardware engineering systems. Artificial intelligence (AI) is a miscellaneous and multi-faceted field that includes several sub- areas of research, each of them focusing on different features of replicating or enhancing human intelligence through machines. Here's a brief overview of some of the key sub-areas within AI:

1. ***Search Technologies***: This area involves developing algorithms and techniques to efficiently search through large problem spaces to find optimal solutions. Search technologies are commonly used in areas like planning, games, and optimization problems.
2. ***Knowledge Representation***: It deals with the design and implementation of formal structures to represent and store knowledge in a way that computers can understand and reason with. Techniques such as semantic networks, frames, and ontologies are used to model relationships between different pieces of information.
3. ***Robotics***: Robotics combines AI with mechanical engineering to design, build, and program robots that can perform tasks autonomously or semi-autonomously. Robotic systems often rely on various AI techniques to perceive and interact with their environment.
4. ***Machine Learning***: Machine learning is a crucial sub-area of AI that focuses on algorithms and statistical models that enable computers to learn from data and improve their performance over time. It includes both supervised learning (with labeled data) and unsupervised learning (with unlabeled data), as well as reinforcement learning (agents learn from interactions with an environment).
5. ***Knowledge-based Systems***: Knowledge-based systems use a knowledge base to reason and draw conclusions. They typically employ rules and logical inference to make decisions or answer questions.
6. ***Machine Vision***: Similar to computer vision, machine vision is the application of AI techniques to industrial and manufacturing processes, enabling machines to perform quality control, inspection, and automation tasks.

7. ***Genetic Algorithms***: Inspired by biological evolution, genetic algorithms are optimization techniques that mimic natural selection to find solutions to complex problems.
8. ***Neural Networks***: A subset of machine learning, neural networks are models inspired by the structure and function of the human brain. They excel in tasks such as image and speech recognition, natural language understanding, and decision-making.

AI has a surplus of concepts and methods with the potential to impact mathematical modeling practice. Specifically, knowledge-based structures and situations offer illustrations and problem-solving methods to encode field knowledge and specific approaches for various ill- structured problems in model generation and result interpretation. Advanced AI programming languages and methodologies enable high-level mechanisms for implementing numerical models and solutions, resulting in cleaner, easier-to-write, and more adaptable computational mechanics codes.

Mathematical modelling is an essential tool to understand the any complex real world problem. We are using mathematical model to understand the analytical or approximate solution of the problem. Mathematical modelling help the investigator to understand the problem deeply and from the analytically or approximately analysis investigator can be modify the model.

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