Chapter 5
Travel Health:
The Application of Artificial Intelligence and Machine Learning

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ABSTRACT

Travelers and healthcare professionals can now find creative answers to a range of problems with the revolutionary applications of artificial intelligence (AI) and machine learning (ML) in the field of travel health. AI and machine learning are transforming travel wellbeing by boosting risk assessment, offering real-time monitoring, enabling remote consultations, and strengthening general health management. With the use of these technologies, tourists can discover new places with more safety and health benefits. AI analyzes data and gives travelers and health authorities useful insights to assist coordinate responses during health emergencies or outbreaks. AI and machine learning are transforming travel wellbeing by boosting risk assessment, offering real-time monitoring, enabling remote consultations, and strengthening general health management. With the use of these technologies, tourists can discover new places with more safety and health benefits.

1. INTRODUCTION

From a paper-and-pen world to a digital one, healthcare has continued to change. This transformation has greatly expanded the prospects for safe, effective, and high-quality care. The utilization of growing computing capacity and the transformative influence of artificial intelligence (AI) and machine learning (ML) are essential to these prospects. Every facet of healthcare, including diagnosis, treatment choices, predictive analysis, and even administrative tasks like billing and coding, may be impacted by AI/ML. However, the promise of AI/ML has a cost: AI systems, particularly those that rely on machine learning (ML), are susceptible to deliberate attacks that use data poisoning, model replication, evasion, and the exploitation of conventional software flaws to trick, manipulate, compromise, and render them ineffective.

However, far too many businesses implementing AI/ML systems are ignorant of their weaknesses. In order to be ready to use these advancements in the safest manner for our communities, it is critical that everyone involved in healthcare technology, including individual practitioners and administrative and clinical executives in big healthcare systems,

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grasp the background cyber hazards of AI/ML. Additionally, manufacturers who create AI/ML-enabled gadgets must comprehend the long-term effects of defects or vulnerabilities in their security or software.

What are AI and ML?

According to the American National Standards Institute (ANSI), artificial intelligence is: (GT, Hamer, & Chen, 2022) A field of computer science focused on creating data processing systems that are capable of reasoning, learning, and self-improvement—tasks typically associated with human intellect.

"Intelligence, while defined in various ways, is generally the ability to perceive or infer information, to retain this information as knowledge, and to be able to use this knowledge to adapt behaviors to apply to problem sets within a given environment" (Young, Amara, Bhattacharya, & Wei, 2021). The ability of a device to perform functions those are typically associated with human intelligence, such as reasoning, learning, and self-improvement. In order to solve issues, artificial intelligence (AI) still functions as a toolbox of many methods and techniques that simulate intelligence.

Large knowledge databases, formal logic, and modeling human problem-solving are some of the techniques AI uses to mimic animal behavior. Although machine learning is a subset of the aforementioned efforts, it has likely been the most effective and dominant approach to date. Deep Learning Neural Networks and Support Vector Machines are two of the most well-known machine learning techniques. These algorithms aim to simulate how the human brain functions.

Other Industries Use of AI

Over time, AI/ML has spread throughout many businesses in a variety of forms. Outside of healthcare, there are numerous lessons to be learned from the advantages and dangers of AI/ML technology. According to the 2010 report of the President's Council of Advisers on Science and Technology (PCAST), IT and in particular interoperability in US healthcare were far from the levels of sophistication achieved in many other industries, including finance, markets, e-commerce, travel planning, navigation, fraud detection, and marketing. In 2009, the potential benefits of advances in computer science and technology in other industries seemed obvious to the medical community.

Early instances of successful AI tool use in these industries either

1. featured tasks that a human could perform but that a machine could perform more frequently and, in certain situations, more effectively, or
2. offered more seamless and effective human-machine interaction. Internet querying, natural language processing, computer vision and image analysis, robotics, voice, fingerprint, and face recognition for biosecurity, voice control of devices, machine learning and advanced data mining, and a variety of planning applications are a few examples.

To better detect suspicious lateral movements within a healthcare network or to help identify potential insider threats, AI and ML software can also be used for healthcare cyber security by analyzing the vast volume of enterprise O/S, Application, and Database events in conjunction with network flow analytics.

What Are the General Risks for Utilizing AI/ML in Healthcare That Can Impact Patients?

The assumption that intelligent systems, such as those that use artificial intelligence and/or machine learning, will solve problems and automate tasks in the healthcare environment is supported by a sizable body of technology literature and articles in the healthcare and other industries. They identify other possible uses with one area after seeing outcomes in another. Leveraging AI across apps is not easy, though. These systems are intricate, employ a wide range of data sources, and employ use case-specific algorithms. Moving to a different use case is very difficult, especially when it comes to aligning with operational procedures.

Similarly, ethical issues like bias, systems design, communication, and transparency present difficulties. The requirements for creating AI systems that are ethically aligned are not well captured by frameworks for conventional software development and design. This implies that a large number of the engineers and architects who created them could not be