The Role of Artificial Intelligence in Personalized Medicine: A Computer Science Perspective

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Abstract
This abstract investigates the role of AI in personalized medicine using a computer science lens that connects the underlying theories with their actual applications. It looks at how healthcare AI techniques like deep learning, natural language processing, or even predictive analytics can revolutionize the industry by changing how treatments are administered to be based on the individual profiles of each patient. The investigation defines an entire framework that outlines steps from gathering and preparing the data to the training, validation, and execution of the model, thus illustrating how predictive models can indeed be employed to suggest personalized therapies. A fictional example is given to demonstrate one aspect of how AI can assist in the decision making by accepting genetic and clinical information on the patient and generating treatment proposals that are most likely to lead to better results. Also, the paper points to some other significant issues related to privacy such as the integration of databases, the lack of algorithms' transparency and ethics, and barriers at the level of regulation, while, at the same time, emphasizing the need for real-time AI powered personalization and contactless advanced AI techniques. In summary, this work is intended to aid computer science students in making meaningful contributions towards the advancement of personalized medicine and stressing the importance of AI as the key to more efficient and customized healthcare.

Keywords: Personalized Medicine; Artificial Intelligence; Machine Learning; Predictive Analytics; Ethical Considerations.