Short Communication

Artificial Intelligence and Large Language Models (LLM) in Healthcare: Unraveling Complexities for Individualized Care

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The intersection of artificial intelligence (AI) and large-scale language models (LLM) in the field of healthcare represents a paradigmatic revolution, promising to radically transform clinical practice. However, it is essential to assess the impact of these new technologies from the individualized perspective of the patient, going beyond initial expectations to evaluate the implications of these technologies for personalized care.

The historical analysis reveals an ascending evolutionary trajectory, where rule-based systems gave way to pre-trained language models

- 1950s: The emergence of AI dates back to the 1950s, with pioneers such as Alan Turing and John McCarthy, where foundational concepts were developed, laying the groundwork for subsequent systems.
- 1980s: Knowledge-based systems gained prominence, marking a transition from purely algorithmic approaches to systems that incorporated specialized knowledge.
- 1990s: Witnessed advancements in the field of machine learning, with a growing emphasis on the practical application of this approach in various areas, including healthcare.
- 2000s: The exponential increase in data availability and significant advances in computational capacity provided fertile ground for the development of more complex AI models.
- 2010s to the present: Witnessed the emergence of pre-trained language models such as GPT (Generative Pretrained Transformer) and BERT (Bidirectional Encoder Representations from Transformers), representing a paradigm shift in understanding and generating language.

As can be perceived, the development of these technologies, forged through the expansion of computational capacity and the refinement of machine learning techniques, denotes a continuous and incremental trajectory, permeated by substantial innovations over the past 70 years.

"In current times, we can already observe the growing presence of AI and LLM in healthcare practices. Conveniences such as rapid and improved diagnostics, decision-making support, prognostic prediction, and personalized treatments are some of the promises already conceived. However, it is crucial to recognize that the implementation of these technologies is not exempt from challenges, such as ethical issues, interpretability of models, and the need to garner the trust of healthcare professionals. The absence of a robust regulatory framework can also amplify non-transparent practices, lack of accountability, and potential negative implications for the safety and privacy of patients."

"The advantages of using these resources are evident and range from time optimization and increased diagnostic accuracy to supporting precise and protocol-driven clinical decision-making. Regarding inherent risks, there are those associated with patient privacy, algorithmic biases, and the potential for excessive reliance on the use of these tools. The challenge lies precisely in balancing tangible benefits with ethical responsibility and preserving the doctor-patient relationship."

In the healthcare domain, we have multiple possibilities for the application of AI based on LLM: from screenings conducted by non-medical healthcare professionals to the longitudinal management of chronic diseases. The effective integration of these resources in

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the field necessitates a collaborative approach among technology developers, healthcare professionals, and regulators, aiming to ensure a safe and efficient environment for the implementation of this kind of resource.

Continuous improvement must be guided by transparency, equity, collective participation, and accountability of related stakeholders. Issues such as clinical validation of AI models, adaptability to individual patient nuances, and harmonization of these resources with the fundamental ethical principles of medical practice need to be taken into account during technological enhancement.

Finally, AI supported by LLM resources has become a landmark in the technological landscape, proving to be of fundamental importance in the context of assistive technologies for healthcare, offering unparalleled potential, albeit not without challenges and complexities. As we navigate this uncharted territory, it becomes essential to adopt a critical stance, always maintaining a focus on patient primacy and safety, while also seeking to preserve the integrity of the physician-patient relationship. Thus, it is imperative to address these challenges in a balanced manner, considering not only technological efficiency and sophistication but also ethics, interpretability, and equity, ensuring a safer and more inclusive future in the field of artificial intelligence in healthcare.