J-BHI Special Issue on "Trustworthy and collaborative AI for personalised healthcare through edge-of-things"

The evolution of artificial intelligence (AI) has contributed to advances in personalised healthcare applications, from diagnosis to therapies. From the first generation of healthcare technologies for handling structured data to the current mainstream healthcare technologies (represented by Big Data platforms) for processing unstructured data, the history of AI in healthcare is closely related to the changes in the types and volumes of data we need to deal with. The next generation of healthcare technologies will be designed to deal with Edge-of-Things data, represented by a massive amount of streaming data generated from Internet-of-Things frameworks, Cloud systems, and Edge computing platforms. Benefiting from the encouraging results of AI on Big Data, AI for personalised healthcare through Edge-of-Things will pave the way for intelligent health-related applications on edge devices, such as smart sensors and wearable devices. For example, health data (e.g., images, audio recordings, and biosignals) can be processed by interactive virtual agents for health status reports and suggestions to individuals. Additionally, health data can also be transferred to clinicians for diagnosing diseases, making personalised treatment plans, and monitoring the health status of individuals. However, the variety and complexity of these data require the provision of new AI models and technologies able to process and analyse them in a trustworthy and collaborative way. In this context, the characteristics of trust and collaboration in AI systems are highly valuable for applying AI to personalised healthcare services. Trustworthy and collaborative AI is designed to encourage transparent, reliable, and unbiased AI systems and ensure their adequacy to tackle predictive and prescriptive healthcare problems. In order to be trustworthy and collaborative, such AI systems need to be able to understand what's wrong, figure out how to overcome the resulting problems, involve human intelligence in the discovery process, and then take what they have learnt to overcome those challenges for the future.

This special issue's intended focus is advancements in all state-of-the-art trustworthy and collaborative AI techniques for personalised healthcare. In this trending area of personalised healthcare, the special issue is expected to promote related research studies and establish a new era of healthcare systems with AI. The special issue will highlight, but not be limited to the following topics:

- Trustworthy AI models for health, medicine, biology, and biomedical applications
- AI-driven Edge of Things infrastructure for healthcare
- Discussion of the trade-off between explainability and performance of machine learning
- Development of model-specific or model-agnostic approaches for explaining machine learning models
- Generation and detection of adversarial attacks for safety in AI systems for personalised healthcare
- Federated Learning for data privacy in AI systems for personalised healthcare
- Fairness and bias issues in AI systems for personalised healthcare
- Designing integrating virtual agents for healthcare usages
- Collaborative robots for healthcare usages

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Key Dates

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