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J-BHI Special Issue on "Trustworthy Machine Learning for Health Informatics"

The past decade has witnessed a remarkable growth of machine learning (ML) research in healthcare. Studies have reported that ML has achieved expert-comparable or even expert-surpassed performance for various healthcare tasks, such as radiology, pathology, dermatology, ophthalmology, and cardiology, which holds the promise of becoming widely applicable in clinical practice. Despite achieving high accuracy, the landing of current ML technology in real-world healthcare scenarios is essentially challenged by its trustworthiness. Great attention has been drawn to improving the credibility of healthcare ML in the aspects of explainability, generalization, fairness, privacy-preserving ability, accountability, etc., to enhance the trust and confidence of doctors and patients in adopting the related techniques.

Improving the trustworthiness of ML in healthcare requires bringing joint efforts from multiple fields such as machine learning, clinical research, and medical imaging to provide insights from different perspectives of algorithm design, data acquisition and annotation, clinical findings, and benchmark establishment. Therefore, this special issue will provide a timely collection of up-to-date research to benefit researchers and practitioners working in trustworthy machine learning for healthcare informatics.

Topics of interest will include, but not be limited to:

- Generalization to out-of-distribution samples.
- Adversarial attacks to medical machine learning models.
- Domain adaptation and transfer learning in healthcare data.
- Test-time adaptation for healthcare data analysis models.
- Robust learning under label noises.
- Explainability of machine learning models in healthcare.
- Reasoning, intervening, or causal inference for machine learning in healthcare.
- Debiasing ML models from learning shortcuts in medical data.
- Fair ML for healthcare.
- Uncertainty estimation of ML models and medical data.
- Federated learning for healthcare data.
- Learning informative and discriminative features under weak annotations.
- Human-machine cooperation (human-in-the-loop, active learning, etc.) in healthcare, such as medical image
- analysis.
- Multi-modal fusion and learning, such as computed tomography (CT), magnetic resonance imaging (MRI), ultrasound, pathology, genetics, electronic healthcare records, etc.

Guest Editors

Dr. Hao Chen, jhc@cse.ust.hk
The Hong Kong University of Science and Technology, Hong Kong, China
Dr. Daguang Xu, daguangx@nvidia.com
AI-Infra, NVIDIA, USA
Dr. Luyang Luo, cseluyang@ust.hk
The Hong Kong University of Science and Technology, Hong Kong, China
Prof. Jing Qin (Harry), harry.qin@polyu.edu.hk
The Hong Kong Polytechnic University, Hong Kong, China
Dr. Yueming Jin, ymjin@nus.edu.sg
National University of Singapore, Singapore

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