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Special Session Title:

Advances in Computational Medical Imaging – From Deep Learning to Generative AI

Brief Description of the proposed topic (15-300 words):

Artificial Intelligence (AI) technology has attained an extraordinary maturity recently and continues to redefine the landscape of medical imaging and diagnosis, enabling unprecedented advancements in disease understanding and detection, and grading, thus helping medical practitioners to scrutinize the progression hence aiding to personalize the treatment. This special session aims to explore and discuss recent advancements in AI, Machine Learning (ML), Deep Learning (DL), and emerging Quantum Learning (QL) for medical imaging applications, including cancer detection and grading, diabetic retinopathy grading and screening, radiology, and MRI-based diagnostics. From Convolutional Neural Networks (CNNs) and transformer-based models to visual transformers, generative AI and hybrid quantum-classical approaches, AI-driven solutions are enhancing image analysis, analyzing complex imaging data, and improving interpretability in clinical workflows. Notably, generative models contribute to data augmentation, synthetic image creation, and anomaly detection, while quantum-enhanced ML algorithms show promise in accelerating image processing and analysis; and optimization tasks.

Papers are invited in relevant applications mentioned below but are not restricted to:

- explainable AI for medical diagnostics
- multimodal fusion of imaging and clinical data
- self-supervised learning
- federated learning for privacy-preserving AI
- quantum-enhanced imaging analysis.

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