



IEEE Transactions on Medical Imaging Special Issue on **Federated Learning for Medical Imaging**

Conventional wisdom for machine learning and especially deep learning in medical imaging says that larger and more diverse data is needed to train better AI models. However, one particularity in the medical imaging setting is that data sharing across different institutions is often complicated by strict privacy regulations and data-ownership concerns, making the collection of large-scale, diverse centralized datasets practically impossible. Therefore, methods for training on large distributed datasets without sharing data and breaching restrictions on privacy and property, like Federated Learning (FL), are needed. Different institutions can build more robust models using FL by performing collaborative training without sharing raw training data. However, the medical FL use case is inherently different from other domains and comes with its characteristics, e.g. in terms of number of participants and data diversity.

This Special Issue focuses on methodological advancements around FL schemes for machine learning and deep learning in medical imaging. We are looking for contributions that show how FL may help moving AI models in medical imaging from research into the clinic. Topics of interest include but are not limited to:

- Federated, distributed learning, and other forms of collaborative learning that are applicable for medical imaging
- Topologies: Server-centric, peer-to-peer, cyclic, swarm learning, etc.
- Optimization methods for FL for medical imaging
- Privacy-preserving and security techniques for FL for medical imaging
- Efficient communication and learning (multi-device, multi-node)
- Adversarial, inversion, back-dooring, and other forms of attacks on distributed or collaborative learning
- Dealing with heterogeneous and unbalanced (non-IID) data in FL for medical imaging
- Responsibility, explainability, and interpretability in FL for medical imaging
- Software tools and implementations of FL for medical imaging
- Model sharing techniques, sparse/partial learning of models in medical imaging
- New applications of FL techniques for medical imaging: image classification/segmentation/reconstruction, regression, multi-task learning, model agnostic learning, meta-learning, unsupervised, etc.

Authors must submit papers on [ScholarOne](#) according to the instructions [here](#). Please choose “Special Issue on Federated Learning for Medical Imaging” as the manuscript type in the submission process. Four reviewers will be typically recruited according to the standard TMI review protocol. Authors are encouraged to discuss with one of the guest editors to determine suitability for this special issue.

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