Special Issue on

AI for Image Reconstruction and Processing in Radiation Imaging

Call for papers

AI is leading to a paradigm shift in methodology for medical image reconstruction, and in particular for emission and transmission tomography. The ability to learn highly complex mappings from noisy imaging data to high-quality references delivers significant enhancements over conventional data-fidelity driven reconstruction methods regularised with their relatively general priors. Powerful image generator networks also allow the probability density functions for realistic medical images to be sampled with ease. Methods which embed machine-learned mappings, with exploitation of existing imaging physics models and established iterative algorithms, offer great benefits for improved image quality, but with varying demands for training data. Thus, data curation, augmentation and synthesis are of relevance. Furthermore, translation of AI-based imaging techniques into clinical practice also suggests research opportunities for image quality assessment and regulatory evaluation.

We invite papers to this special issue on topics that include but are not limited to:
- Unrolled iterative image reconstruction methods which combine machine learning with known imaging physics models
- Full end-to-end mappings for learning the entire image reconstruction mapping
- Post-reconstruction processing methods for image enhancement, including denoising, deblurring, and image artefact correction
- AI methods for estimation of pharmacokinetic parameters from dynamic data, including 4D image reconstruction
- Generators for realistic image simulation, generation and data augmentation
- Strategies for assessing and achieving optimal risk-benefit trade-offs with AI approaches

Authors must submit papers digitally to https://mc.manuscriptcentral.com/trpms, using standard IEEE Transactions format, indicating in their cover letter that the submission is aimed for this special issue. Codes and data sharing are encouraged. Authors are encouraged to contact the guest editors to determine suitability of their submission for this special issue.

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Schedule:

Submission of manuscripts:	Dec 1, 2019
Acceptance/rejection notification:	Feb 1, 2020
Revised manuscripts due:	Apr 1, 2020
Publication:	Aug 2020 (Tentative)