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National experts chart roadmap for AI in medical imaging

23 April 2019 | News

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A foundational research roadmap for artificial intelligence (AI) in medical imaging was recently published in the journal Radiology. The report was based on outcomes from a workshop to explore the future of AI in medical imaging, featuring experts in medical imaging, and hosted at the National Institutes of Health in Bethesda, Maryland. The workshop was co-sponsored by the National Institute of Biomedical Imaging and Bioengineering, the Radiological Society of North America, the American College of Radiology, and the Academy for Radiology and Biomedical Imaging Research.

The collaborative report underscores the commitment by standards bodies, professional societies, governmental agencies, and private industry to work together to accomplish a set of shared goals in service of patients, who stand to benefit from the potential of AI to bring about innovative imaging technologies.

The report describes innovations that would help to produce more publicly available, validated and reusable data sets against which to evaluate new algorithms and techniques, noting that to be useful for machine learning these data sets require methods to rapidly create labeled or annotated imaging data. The roadmap of priorities for AI in medical imaging research includes:

- new image reconstruction methods that efficiently produce images suitable for human interpretation from source data,
- automated image labeling and annotation methods, including information extraction from the imaging report, electronic phenotyping, and prospective structured image reporting,
- new machine learning methods for clinical imaging data, such as tailored, pre-trained model architectures, and distributed machine learning methods,
- machine learning methods that can explain the advice they provide to human users (so-called explainable artificial intelligence), and
- validated methods for image de-identification and data sharing to facilitate wide availability of clinical imaging data sets.