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DeepPTx: parallel transmission MRI using deep learning

A novel deep neural network to enhance MRI image reconstruction.

IP Status: US Patent Issued; Issued Patent No. 11,982,725

Applications

- Generate full parallel transmit-like high-fidelity images using single transmit systems

Technology Overview

Parallel transmit (pTx) is a powerful technique used to overcome the challenges of ultra-high field MRI while achieving the corresponding increase in signal-to-noise ratio (SNR). However, conventional pTx requires careful pulse design and tedious calibration thereby hindering clinical adoption. Researchers at the University of Minnesota have developed a novel deep-learning framework, deepPTx, which trains a deep neural network to directly predict pTx-like images from images obtained with single-channel transmit (sTx) systems. This method substantially enhances image quality relative to sTx approaches and does not require either pTx hardware or specialized pTx expertise in pulse design.

Phase of Development

TRL:4-5
Demonstrated on Siemens 7T Terra MRI scanner for whole-brain diffusion MRI.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

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Researchers

- **Xiaoping Wu, PhD** Assistant Professor, Department of Radiology
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References

1. Xiaodong Ma, Kâmil Uğurbil, Xiaoping Wu(April 2022) , https://onlinelibrary.wiley.com/doi/full/10.1002/mrm.29238, Magnetic Resonance in Medicine

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