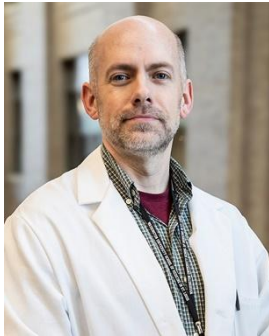


Dr. Jeramy Lewis

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Friday, April 4, 11:00 am. Osborne A204

AI-powered Gradient Echo Plural Contrast Imaging (AI-GEPCI) - a Comprehensive Neurological Protocol from a Single MRI Scan



Artificial Intelligence (AI) and Deep Learning (DL) offer a powerful approach to advancing the clinical application of Magnetic Resonance Imaging (MRI). This work presents preliminary results applying AI to Gradient Echo Plural Contrast Imaging (GEPCI), a post-processed multi-echo Gradient Recalled Echo (mGRE) sequence. A series of deep learning networks (AI-GEPCI) were trained to translate GEPCI input images into clinical-quality Fluid-Attenuated Inversion Recovery (FLAIR), Magnetization-Prepared Rapid Acquisition with Gradient Echo (MPRAGE), and $R2^*$ maps, along with additional derived contrasts. Radiological and clinical evaluations confirm that the AI-generated images met or exceeded clinical imaging quality standards while also enhancing lower-quality scans affected by acquisition artifacts. These findings highlight the potential of AI-GEPCI to streamline neuroimaging by generating multiple clinically relevant contrasts from a single GEPCI MRI scan.

Short Bio

Dr. Jeramy Lewis is a Postdoctoral Research Associate at the Mallinckrodt Institute of Radiology, Washington University in St. Louis School of Medicine. His translational research focuses on multiple sclerosis, Alzheimer's disease, quantitative MRI-based methods, and the integration of machine learning, artificial intelligence, and deep learning in medical imaging. Working within a highly collaborative scientific environment, he engages closely with leading researchers and clinicians in MRI, radiology, neurology, and computer science. He earned his Ph.D. in Applied Physics from the University of Colorado – Colorado Springs in Spring 2023.