Research finds efficacy of artificial intelligence in MRI artefact removal

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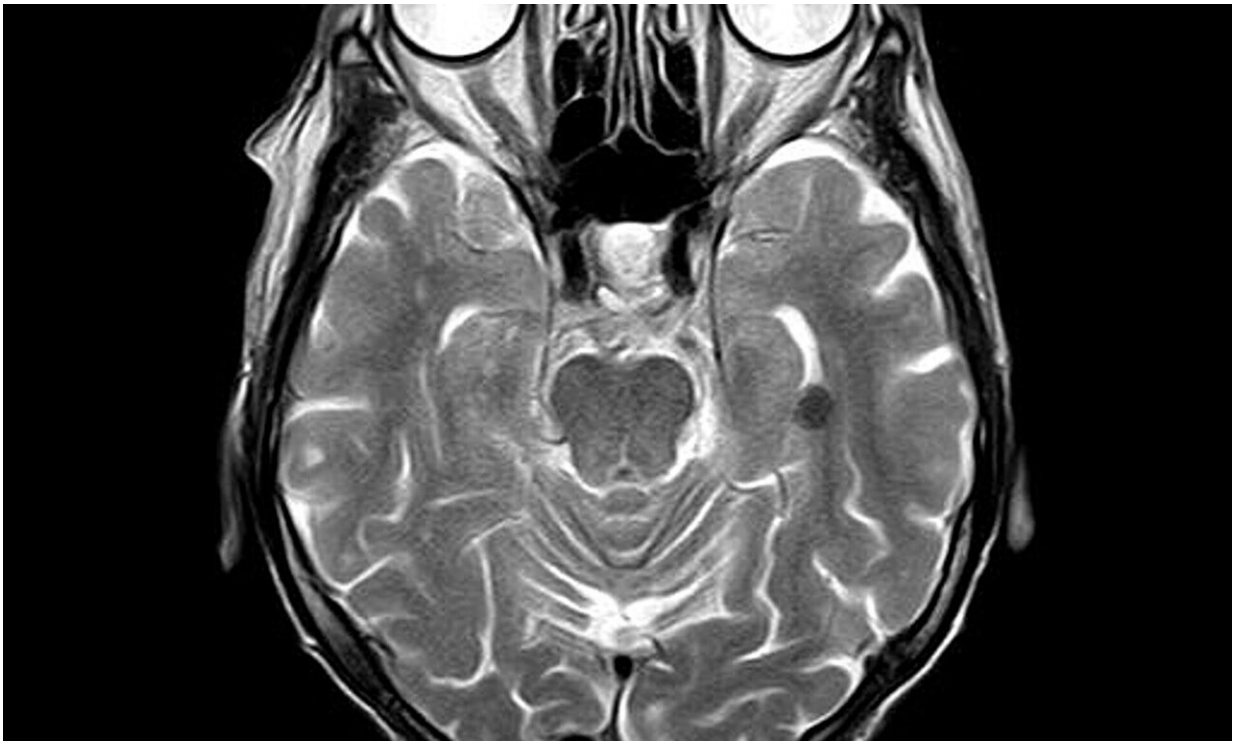

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Pew-Thian Yap, Ph.D., associate professor of Radiology and director of the UNC Image Analysis Group (BRIC), is the senior author of experimental results published in *Nature Machine Intelligence* demonstrating effective use of an Retrospective Artefact Correction (RAC) neural network learned with unpaired data to disentangle and

remove unwanted image artefacts.

Magnetic resonance imaging (MRI) is susceptible to artefacts caused by motion that can render the images unusable and cause financial losses in imaging studies. At UNC's Biomedical Research Imaging Center (BRIC), Image Analysis Core Director Pew-Thian Yap, Ph.D. leads a team that explores use of deep learning to identify poor-quality images with near-human accuracy in milliseconds. Their investigative work is aimed at increasing timely decision-making in MRI re-scan.

Retrospective artefact correction (RAC) is an increasingly investigated technique in MRI for correction of motion-induced artefacts. In the January 19, 2021 issue of *Nature Machine Intelligence*, Dr. Yap's investigative team published experimental results using UNC/UMN Baby Connectome Project data that demonstrated the effective use of an RAC neural network learned with unpaired data to disentangle and remove unwanted image artefacts. Their findings also revealed the capacity of the RAC network to retain anatomical details in MR images with different contrasts, improve MRI quality post acquisition, and enhance image usability.

The impact of this National Institute of Biomedical Imaging and Bioengineering (NIBIB)-funded study in applied imaging evidences superior motion correction via artificial intelligence techniques for RAC. This investigation demonstrates further study of reliable artificial intelligence techniques for RAC is warranted to benefit image correction and reconstruction in future MRI studies.

Dr. Yap noted: "AI-powered RAC can salvage innumerable images with motion artefacts to significantly boost the quantity of usable images and reduce financial losses for imaging studies."

More information: Siyuan Liu et al. Learning MRI artefact removal

with unpaired data, *Nature Machine Intelligence* (2021). DOI: 10.1038/s42256-020-00270-2