(SD2021-401) Automated Correction of Background Phase Error for Cerebrovascular 4D Flow MRI

Tech ID: 32438 / UC Case 2021-Z08-1

BACKGROUND

Currently, there are no automated solutions for phase-error correction that are effective for brain imaging.

TECHNOLOGY DESCRIPTION

This disclosure contains the intellectual property (i.e., software, know-how) for neurovascular implementation of the patent-pending related algorithm, Automated deep correction of MRI phase-error (SD2021-221).

Researchers from UC San Diego have developed software-based method that leverages a convolutional neural network (CNN) that automatically recognizes phase-error within 4D Flow MRI velocity data and generates a correction for this phase error. The software algorithm provides compatibility with other image-based software strategies for correcting phase-error so that they can be "stacked" or used complementarly.

ADVANTAGES

- This CNN-based algorithm nearly completely eliminates phase-error artifact, almost as good as manual correction, eliminating the need for training physicians or technologists to perform this complicated data fitting exercise which is unfamiliar to most physicians and medical professionals.
- It is very fast computationally, which means it can be run with very little computational cost.

INTELLECTUAL PROPERTY INFO

UC San Diego is seeking partners to commercially develop the software and technology for application to brain MRIs.

USER DEFINED 2

For the following figure:

Images demonstrate proof-of-concept for fully-automated background phase error correction in axial and coronal views. Uncorrected, manually-corrected, and CNN-corrected velocities in the right-to-left direction are shown in a 33-year-old female with Spetzler-Martin grade 4 right basal ganglia AVM (yellow arrow) MRI (A). Background phase error is evident as a gradient for the uncorrected velocities (B) and improves after manual (C) and CNN correction (D). AVM = arteriovenous malformation, MRA = magnetic resonance angiogram, CNN = convolutional neural network.

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OTHER INFORMATION

KEYWORDS

eddy current, correction, phase error, MRI, 4D flow, neurovascular, brain

CATEGORIZED AS

- **Imaging**
  - Medical
- **Medical**
  - Diagnostics
  - Imaging

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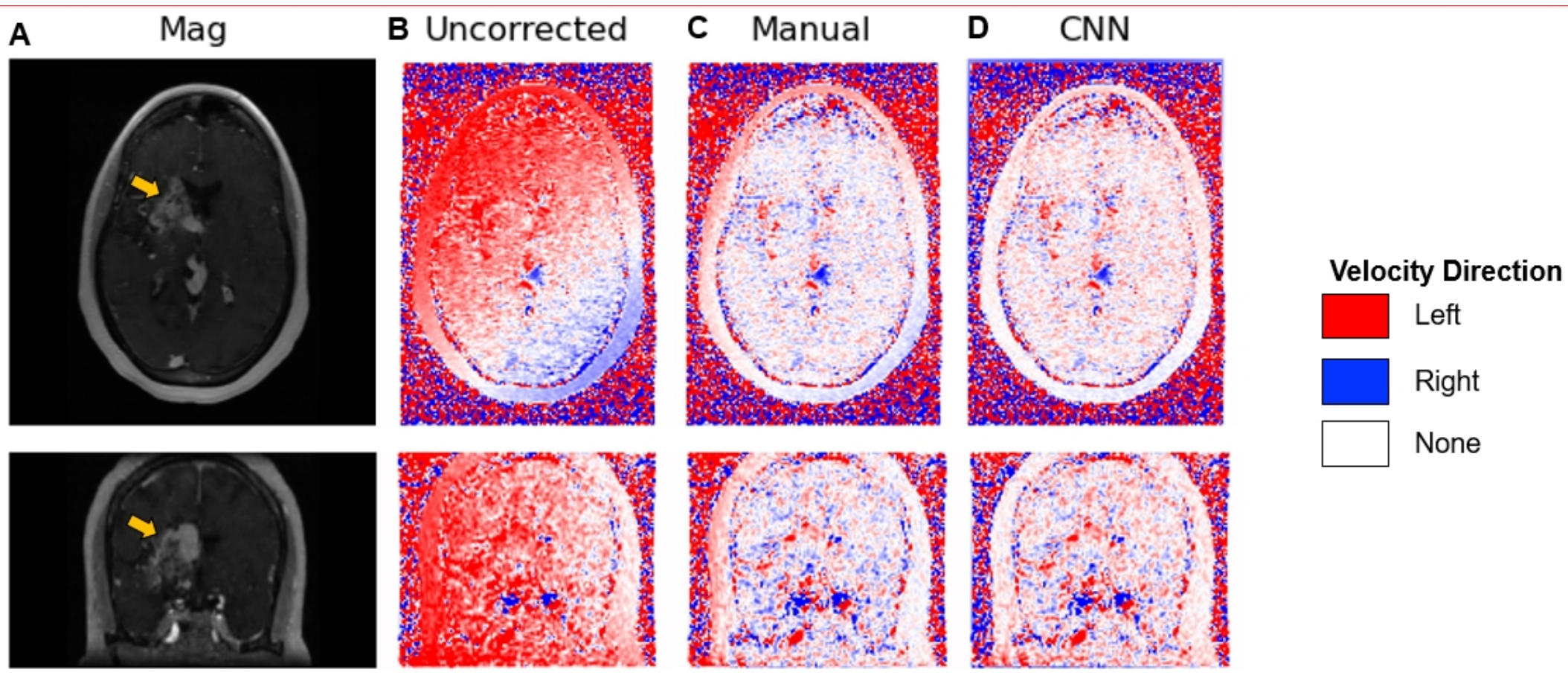

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