



Referenceless Nyquist Ghost Correction for Echo Planar Imaging (EPI)

IP Status: US Patent Issued; Issued Patent No. 11,009,577

Removes Nyquist ghost artifacts

A novel referenceless technique corrects magnetic resonance imaging (MRI) images by removing Nyquist ghost artifacts from echo planar imaging (EPI). The algorithm seeks to find a set of optimal phase correction parameters that minimize a metric calculated directly from uncorrected images. The metric is defined as the sum of the ratio between the image and an image shifted by half of the field of view (FOV). The method is effective for not only single shot EPI, but also for multi-shot EPI, where current methods require a reference scan, navigators or user intervention.

Better artifact removal, increased robustness, faster acquisition

Echo planar imaging (EPI), used for fast imaging on magnetic resonance imaging (MRI) scanners, is prone to an artifact known as a Nyquist ghost. While existing methods can offer Nyquist ghost correction, they often fail in body imaging due to insufficient fat suppression. This technology offers a unique Nyquist ghost correction method with better performance, increased robustness and reduced acquisition requirements compared to existing methods.

Phase of Development

- Proof of concept. Post processing of in vivo diffusion weighted breast imaging.

Benefits

- Performance exceeds alternatives and is faster
- Better artifact removal
- Increased robustness

Features

- Referenceless; does not require separate reference scan
- Does not require fitting or masking
- Integrates with accelerated imaging
- Online reconstruction (software) implemented on MR scanners

Applications

- Magnetic resonance imaging (MRI)
- Echo planar imaging (EPI)

Researchers

Patrick Bolan, PhD

Associate Professor, Radiology (Center for Magnetic Resonance Imaging)

[External Link](http://www.med.umn.edu) (www.med.umn.edu)

Technology ID

20180065

Category

Engineering & Physical Sciences/Instrumentation, Sensors & Controls
Life Sciences/Diagnostics & Imaging
Life Sciences/Medical Devices
Software & IT/Algorithms
Agriculture & Veterinary/Veterinary Medicine

Learn more



Publications

[Nyquist ghost correction of breast diffusion weighted imaging using referenceless methods](#)

Magnetic Resonance in Medicine, 2018;1-8

Interested in Licensing?

The University relies on industry partners to further develop and ultimately commercialize this technology. The license is for the sale, manufacture or use of products claimed by the patents. Please contact us to share your business needs and licensing and technical interests in this technology.