PURDUE INNOVATES | Office of Technology Commercialization

Wearable & Stretchable Electromagnetically-Coupled Radiofrequency Probes

Conductive-thread fabric probes that boost MRI signal-to-noise while conforming to anatomy.

Magnetic resonance imaging (MRI) is inherently a low-sensitivity technique, and there is a desire to boost signal-to-noise ratio (SNR), a leading factor in determining image quality. Current approaches to enhancing SNR include shaping receive coil arrays to encompass a generalized form of the anatomy of interest, but these are often rigid and require the patient be posed in a specific way. A flexible and stretchable coil which could be placed close to the skin on an area or joint regardless of its positioning would be immensely beneficial to both quality of MRI results and patient comfort. Researchers at Purdue University have developed an adaptable, wearable, and stretchable fabric embroidered with conductive threads that provides excellent SNR for enhanced MRI imaging. The fabricated coil presents multi-directional stretchability and flexibility while maintaining conductivity and stitch integrity. Quality factor measurements and SNR calculations show that this technology is comparable to current state of the art in SNR results, however, this technology has the added benefits of adaptability and stretchability.

Advantages:

-Adaptable

-Stretchable

-Enhanced signal reception

Potential Applications:

-MRI

TRL: 3

Intellectual Property:

Technology ID
2019-RISP-68630

Category
Materials Science & Nanotechnology/Biomedical & Bioinspired Materials
Digital Health & Medtech/Medical Image Processing

Authors
Joseph Vincent Rispoli

Further information
Patrick Finnerty
pwfinnerty@prf.org

View online

Provisional-Patent, 2019-05-12, United States

PCT-Gov. Funding, 2020-05-12, WO

NATL-Patent, 2021-11-12, United States

Keywords: Biomedical Engineering, Materials and Manufacturing, MRI, Signal-to-noise Ratio