A Method For Accurate Parametric Mapping Based On Characterization Of A Reference Tissue Or Region

Tech ID: 29998 / UC Case 2016-637-0

SUMMARY

UCLA researchers in the Department of Radiology have developed a novel method that addresses a common issue of MRI imaging misinterpretation due to the high field effects of B1+ inhomogeneity.

BACKGROUND

Magnetic Imaging Resonance (MRI) is a modern non-invasive anatomical imaging technique for the visualization of disease states. MRI, like many other forms of non-invasive imaging, relies on contrast for visualization. MR images collected with higher fields offer greater signal to noise ratio, producing a greater observed contrast. This greater proportion of contrast leads to greater target organ visualization as well as a better understanding of disease evolution with scans taken over the course of treatment. However, a major issue to the use of higher fields for imaging lies in the length of the wavelength emitted, which is commonly the same as the organ of interest, leading to constructive and destructive interferences masking the true contrast: a process known as B1+ inhomogeneity. While many attempts have been made to correct for this inhomogeneity, there is still considerable progress to be made to counteract its drawbacks. Therefore, the development of a correction technique could make the use of higher fields more reasonable for clinical applications of MRI, leading to greater potential patient care.

INNOVATION

Dr. Sung at UCLA has developed a novel method to decrease the observed B1+ inhomogeneity in MRI. This method relies on the optimization of the reference region technique for a specified application (i.e. prostate cancer). Optimization of the reference region is achieved through the calibration of the reference region against a mapped sub region that has been weighted through another B1+ inhomogeneity mapping. This invention could lead to the more reasonable and routine use of higher fields in MRI, leading to the better assessment of disease progression.

APPLICATIONS

- The reasonable use of high field imaging for MRI in clinic
- The use of this technique could also be used retrospectively to correct any MRI position issues retrospectively to past scans

ADVANTAGES

- The current technique uses current technology and only deviates in the data analysis portion

STATE OF DEVELOPMENT

The technique has been used and optimized in fat tissues, but further optimization is still underway.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,895,621	01/19/2021	2016-637

RELATED MATERIALS

- Dregely, Isabel, et al. "Rapid quantitative T2 mapping of the prostate using three-dimensional dual echo steady state MRI at 3T." Magnetic resonance in medicine (2016).

CONTACT

UCLA Technology Development Group
ncd@tdg.ucla.edu
tel: 310.794.0558.

INVENTORS

- Sung, Kyung H.

OTHER INFORMATION

KEYWORDS

MRI, B1+ field inhomogeneity, high field imaging, parametric mapping, reference region mapping, anatomical imaging, disease progression visualization, vital organ health

CATEGORIZED AS

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

RELATED CASES

2016-637-0

▶ Chung, Dong Jin, et al. "Contrast Enhancement Patterns after Irreversible Electroporation: Experimental Study of CT Perfusion Correlated to Histopathology in Normal Porcine Liver." Journal of Vascular and Interventional Radiology 27.1 (2016): 104-111.

▶ Srinivasan, Subashini, et al. "Fast 3D T2-weighted imaging using variable flip angle transition into driven equilibrium (3D T2-TIDE) balanced SSFP for prostate imaging at 3T." Magnetic resonance in medicine 74.2 (2015): 442-451.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

▶ Deep-Learning-Based Computerized Prostate Cancer Classification Using A Hierarchical Classification Framework

UCLA Technology Development Group

10889 Wilshire Blvd., Suite 920,Los Angeles,CA 90095

tdg.ucla.edu

Tel: 310.794.0558 | Fax: 310.794.0638 | ncd@tdg.ucla.edu