

Accelerated Dynamic Contrast Enhanced Magnetic Resonance Imaging

USC Case #2016-144, 2016-170

Market Opportunity:

Dynamic contrast enhanced magnetic resonance imaging (DCE-MRI) is an imaging technique used most often to evaluate cancer and provide information about tumors or other diseases. Conventional DCE-MRI techniques provide limited resolution and coverage that could result in missing tiny tumors (e.g. 2 mm or smaller) or scattered tumors. Newer DCE-MRI techniques claim to provide better resolution, but they still result in poor image quality and low under sampling rates. Higher under-sampling rates are required for accurate diagnosis and effective treatment. In order to help grow the MRI market, which is projected to be worth \$7.19 billion by 2021, this issue must be addressed.

USC Solution:

USC researchers have developed a direct reconstruction method – a method that directly reconstructs the tracer-kinetic (TK) parameter maps. This method provides improved image quality and high under-sampling rates (up to 100x) over a large coverage area (e.g. the entire brain). These improvements are achieved by using an efficient gradient-based technique to reconstruct the image. Use of this method could help DCE-MRI become the clinical standard for evaluating tumor progression and treatment response.

Value Proposition

- Improved ease-of-use
- High under-sampling rate (up to 100x)
- Allows for a larger coverage area

Keywords:

Nyquist rate, tracer-kinetic modeling, direct reconstruction, constrained reconstruction, dynamic contrast enhanced magnetic resonance imaging



Applications

- Medical imaging
- MRI scanners
- Oncology

Stage of Development

- Experimentally validated
- Available for exclusive and non-exclusive license

Intellectual Property

Status:

Patent Pending

Key Publications:

[Direct Estimation of Tracer-Kinetic Parameter Maps From Highly Undersampled Brain Dynamic Contrast Enhanced MRI, ISMRM 2016.](#)

Contact Information

Denise McKenzie

Licensing Associate
(213) 821-0945
denisemc@usc.edu

USC Stevens

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