

Jaeseok Park *Ph.D., Prof.*

Medical Imaging and Signal Lab. (MISL)
Department of Biomedical Engineering
Sungkyunkwan University, Republic of Korea
jaeseokp@skku.edu, <http://misl.skku.edu>

MAJOR RESEARCH INTERESTS

The objective of my research is to develop novel methodologies in signal processing for medical imaging (Particularly, magnetic resonance imaging). Research interests include: 1) signal processing for medical imaging, 2) image reconstruction, 3) machine learning particularly for deep learning, 4) clinical translations to cancer, stroke, dementia, Alzheimer, and cardiac diseases.

EDUCATION

2001-2005	PhD in Biomedical Engineering (Signal Processing, Medical Imaging), Northwestern University, Dissertation: Magnetic Resonance Angiography using Parallel Data Acquisition (Advisor: Dr. Debiao Li)
1999-2001	MS in Mechanical Engineering (Fluid Dynamics), University of Michigan Dissertation: Numerical and Experimental Simulation of Low Velocity Sub-Cooled Micro-Gravity Two-Phase Flow in Earth Gravity (Advisor: Dr. William Schultz)
1992-1999	BS in Mechanical and Aerospace Engineering, Seoul National University, including Military Service (1993-1996)

PROFESSIONAL EXPERIENCES

2021-Present	Head, Department of Biomedical Engineering, Sungkyunkwan University
2020-Present	Director, Brain Korea 21 Project on Intelligent Precision Healthcare Convergence, Sungkyunkwan University
2015-Present	Professor, Associate Professor (Tenured), Department of Biomedical Engineering, Sungkyunkwan University, Republic of Korea
2011-2015	Assistant, Associate Professor, Department of Brain and Cognitive Engineering, Korea University, Seoul, Republic of Korea
2008-2011	Assistant Professor, Department of Radiology, Yonsei University, Seoul, Republic of Korea
2005-2008	Senior Scientist, Siemens Medical Solution, Erlangen, Germany

PROFESSIONAL SOCIETIES AND ORGANIZATIONS

2022-Present	Editorial Board for Korean Journal of Radiology (KJR)
2016-Present	Editor-In-Chief for Investigative MRI (iMRI)
2012-Present	Associate Editor for Biomedical Engineering Letters (BMEL)
2005-Present	Ad hoc reviewers for IEEE Transactions on Medical Imaging, Neuroimage, Magnetic Resonance in Medicine (MRM), Journal of Magnetic Resonance Imaging (JMRI), Scientific Report
2008-Present	Korean Society of Magnetic Resonance in Medicine (KSMMR)
2001-Present	International Society of Magnetic Resonance in Medicine (ISMRM)

RESEARCH GRANTS

2020-2027	Brain Korea 21 Project on Intelligent Precision Healthcare Convergence; Role: PI
2021-2025	Korea Medical Device Development Fund; Ultra high field brain dedicated MRI; Role: Co-PI
2021-2024	Korea Medical Device Development Fund; Ultrafast MRI using artificial intelligence; Role: Co-PI
2018-2022	National Research Foundation, Accurate quantification of neurodegenerative diseases; Role: PI
2017-2020	National Research Foundation, Development of novel MRI methods for ischemic stroke; Role: PI
2016-2021	National Research Foundation, Imaging-based characterization of small vessel diseases; Role: Co-PI
2016-2018	National Research Foundation, Technique Translation Program, Ultrafast Multiplexing MRI; Role: PI
2011-2014	National Research Foundation, Quantitative Oxygenation and pH Mapping in Brain Cancer; Role: PI
2008-2011	National Research Foundation, Quantitative Mapping of Human Brain Development in Children and Adolescents using Novel High-Resolution Magnetic Resonance Imaging Method; Role: Co-PI
2009-2011	National Research Foundation, Basic Science Research Program, High-Resolution 3D Contrast-Enhanced Whole-Brain MRI Method for Accurate Detection of Small Metastases; Role: PI
2009-2012	National Research Foundation, Basic Science Research Program, Novel Black-Blood Cerebral Vascular MRI Method and its Clinical Applications; Role: PI

TEACHING COURSES

Engineering Mathematics I & II, Linear Algebra, Signals and System, Probability and Random Process, Medical Imaging, Magnetic Resonance Imaging

LANGUAGES

Korean (mother tongue), English (fluent)

PUBLICATIONS

- E. J. Lim, C.-H. Sohn, T. Shin, and J. Park, “FID-calibrated simultaneous multi-slice fast spin echo with long trains of hard pulses,” *Physics in Medicine & Biology*, 2022
- J. S. Park, S.-H. Choi, C.-H. Sohn, and J. Park, “Joint Reconstruction of Vascular Structure and Function Maps in Dynamic Contrast Enhanced MRI Using Vascular Heterogeneity Priors,” *IEEE Transactions on Medical Imaging*, 2021, vol. 41, no. 1, pp. 52–62
- H.-S. Lee, S.-H. Hwang, J. Park, and S.-H. Park, “Single-shot pseudo-centric EPI for magnetization-prepared imaging,” *Magnetic Resonance in Medicine*, 2021, vol. 86, no. 5, pp. 2656–2665
- J. S. Park, E. Lim, S.-H. Choi, C.-H. Sohn, J. Lee, and J. Park, “Model-Based High-Definition Dynamic Contrast Enhanced MRI for Concurrent Estimation of Perfusion and Permeability,” *Medical image analysis*, 2019
- H. Lee, J. J. Chung, J. Lee, S.-G. Kim, J.-H. Han, and J. Park, “Model-based Chemical Exchange Saturation Transfer MRI for Robust z-Spectrum Analysis,” *IEEE transactions on medical imaging*, 2019
- H. Kim, S. Park, E. Y. Kim, and J. Park, “Retrospective multi-phase non-contrast-enhanced magnetic resonance angiography (ROMANCE MRA) for robust angiogram separation in the presence of cardiac arrhythmia,” *Magnetic Resonance in Medicine*, 2018
- H. Lee, E. Y. Kim, C.-h. Sohn, and J. Park, “Rapid whole-brain gray matter imaging using single-slab three-dimensional dual-echo fast spin echo: A feasibility study,” *Magnetic resonance in medicine*, 2017, vol. 78, no. 5, pp. 1691–1699
- H. Kim, D.-h. Kim, C.-h. Sohn, and J. Park, “Rapid chemical shift encoding with single-acquisition single-slab 3d Grase,” *Magnetic resonance in medicine*, 2017, vol. 78, no. 5, pp. 1852–1861
- S. Park and J. Park, “SMS-HSL: Simultaneous multislice aliasing separation exploiting hankel subspace learning,” *Magnetic resonance in medicine*, 2017, vol. 78, no. 4, pp. 1392–1404
- S. Park, E. Y. Kim, C.-H. Sohn, and J. Park, “Dynamic Contrast-Enhanced MR Angiography Exploiting Subspace Projection for Robust Angiogram Separation,” *IEEE transactions on medical imaging*, 2017, vol. 36, no. 2, pp. 584–595
- H. Lee, C.-H. Sohn, and J. Park, “Current-induced alternating reversed dual-echo-steady-state for joint estimation of tissue relaxation and electrical properties,” *Magnetic resonance in medicine*, 2017, vol. 78, no. 1, pp. 107–120

- S. Park and J. Park, “Accelerated dynamic cardiac MRI exploiting sparse-Kalman-smoother self-calibration and reconstruction (k- t SPARKS),” *Physics in medicine and biology*, 2015, vol. 60, no. 9, p. 3655
- H. Lee, W. C. Jeong, H. J. Kim, E. J. Woo, and J. Park, “Alternating steady state free precession for estimation of current-induced magnetic flux density: A feasibility study,” *Magnetic resonance in medicine*, 2016, vol. 75, no. 5, pp. 2009–2019
- H. Kim, D.-H. Kim, and J. Park, “Variable-flip-angle single-slab 3D GRASE imaging with phase-independent image reconstruction,” *Magnetic resonance in medicine*, 2015, vol. 73, no. 3, pp. 1041–1052
- S. Park and J. Park, “Compressed sensing MRI exploiting complementary dual decomposition,” *Medical Image Analysis*, 2014, vol. 18, no. 3, pp. 472–486
- S. Yang, Y. Nam, M.-O. Kim, E. Y. Kim, J. Park, and D.-H. Kim, “Computer-Aided Detection of Metastatic Brain Tumors Using Magnetic Resonance Black-Blood Imaging,” *Investigative Radiology*, 2013, vol. 48, no. 2, pp. 113–119
- H. Lee and J. Park, “SNR-optimized phase-sensitive dual-acquisition turbo spin echo imaging: A fast alternative to FLAIR,” *Magnetic Resonance in Medicine*, 2013, vol. 70, no. 1, pp. 106–116
- H. Lee, C.-H. Sohn, and J. Park, “Rapid hybrid encoding for high-resolution whole-brain fluid-attenuated imaging,” *NMR in Biomedicine*, 2013, vol. 26, no. 12, pp. 1751–1761
- H.-J. Lee, J. Park, J. Hur, Y. J. Kim, J. E. Nam, B. W. Choi, and K. O. Choe, “The effect of pulmonary blood flow changes on oxygen-enhanced lung magnetic resonance imaging,” *Magnetic Resonance in Medicine*, 2013, vol. 69, no. 6, pp. 1645–1649
- J.-M. Kim, K.-H. Jung, C.-H. Sohn, J. Park, J. Moon, M. H. Han, and J.-K. Roh, “High-resolution MR technique can distinguish moyamoya disease from atherosclerotic occlusion,” *Neurology*, 2013, vol. 80, no. 8, pp. 775–776
- J. Park, J. Kim, E. Yoo, H. Lee, J.-H. Chang, and E. Y. Kim, “Detection of small metastatic brain tumors: comparison of 3D contrast-enhanced whole-brain black-blood imaging and MP-RAGE imaging,” *Investigative Radiology*, 2012, vol. 47, no. 2, pp. 136–141
- S. Park and J. Park, “Adaptive self-calibrating iterative GRAPPA reconstruction,” *Magnetic Resonance in Medicine*, 2012, vol. 67, no. 6, pp. 1721–1729
- H. Lee, E.-Y. Kim, K.-S. Yang, and J. Park, “Susceptibility-resistant variable-flip-angle turbo spin echo imaging for reliable estimation of cortical thickness: A feasibility study,” *Neuroimage*, 2012, vol. 59, no. 1, pp. 377–388
- S.-Y. Zho, J. Park, J.-Y. Choi, and D.-H. Kim, “Respiratory motion compensated MR cholangiopancreatography at 3.0 Tesla,” *Journal of Magnetic Resonance Imaging*, 2010, vol. 32, no. 3, pp. 726–732
- J. Park, S. Park, E. Yeop Kim, and J.-S. Suh, “Phase-sensitive, dual-acquisition, single-slab, 3D, turbo-spin-echo pulse sequence for simultaneous T2-weighted and fluid-attenuated whole-brain imaging,” *Magnetic Resonance in Medicine*, 2010, vol. 63, no. 5, pp. 1422–1430

- J. Park and E. Y. Kim, “Contrast-enhanced, three-dimensional, whole-brain, black-blood imaging: Application to small brain metastases,” *Magnetic Resonance in Medicine*, 2010, vol. 63, no. 3, pp. 553–561
- H. Kim, J. S. Lim, J. Y. Choi, J. Park, Y. E. Chung, M.-J. Kim, E. Choi, N. K. Kim, and K. W. Kim, “Rectal Cancer: Comparison of Accuracy of Local-Regional Staging with Two-and Three-dimensional Preoperative 3-T MR Imaging 1,” *Radiology*, 2010, vol. 254, no. 2, pp. 485–492
- H. Jung, J. Park, J. Yoo, and J. C. Ye, “Radial k-t FOCUSS for high-resolution cardiac cine MRI,” *Magnetic Resonance in Medicine*, 2010, vol. 63, no. 1, pp. 68–78
- J. Hur, J. Park, Y. J. Kim, H.-J. Lee, H. S. Shim, K. O. Choe, and B. W. Choi, “Use of contrast enhancement and high-resolution 3D black-blood MRI to identify inflammation in atherosclerosis,” *JACC: Cardiovascular Imaging*, 2010, vol. 3, no. 11, pp. 1127–1135
- Y. E. Chung, M.-S. Park, M. S. Kim, E. Kim, J. Park, H.-T. Song, J. Y. Choi, M.-J. Kim, and K. W. Kim, “Quantification of superparamagnetic iron oxide-mediated signal intensity change in patients with liver cirrhosis using T2 and T2* mapping: A preliminary report,” *Journal of Magnetic Resonance Imaging*, 2010, vol. 31, no. 6, pp. 1379–1386
- J. Park, J. P. Mugler, and T. Hughes, “Reduction of B1 sensitivity in selective single-slab 3d turbo spin echo imaging with very long echo trains,” *Magnetic Resonance in Medicine*, 2009, vol. 62, no. 4, pp. 1060–1066
- M. Notohamiprodjo, A. Horng, M. F. Pietschmann, P. E. Müller, W. Horger, J. Park, A. Crispin, J. R. G. del Olmo, S. Weckbach, K. A. Herrmann *et al.*, “MRI of the knee at 3T: first clinical results with an isotropic PDfs-weighted 3D-TSE-sequence,” *Investigative Radiology*, 2009, vol. 44, no. 9, pp. 585–597
- P. Lai, A. C. Larson, J. Park, J. C. Carr, and D. Li, “Respiratory self-gated four-dimensional coronary MR angiography: A feasibility study,” *Magnetic Resonance in Medicine*, 2008, vol. 59, no. 6, pp. 1378–1385
- J. Park, J. P. Mugler, W. Horger, and B. Kiefer, “Optimized T1-weighted contrast for single-slab 3D turbo spin-echo imaging with long echo trains: Application to whole-brain imaging,” *Magnetic Resonance in Medicine*, 2007, vol. 58, no. 5, pp. 982–992
- X. Bi, J. Park, V. Deshpande, O. Simonetti, G. Laub, and D. Li, “Reduction of flow- and eddy-currents-induced image artifacts in coronary magnetic resonance angiography using a linear centric-encoding SSFP sequence,” *Magnetic Resonance Imaging*, 2007, vol. 25, no. 8, pp. 1138–1147
- J. Park, A. C. Larson, Q. Zhang, O. Simonetti, and D. Li, “4D radial coronary artery imaging within a single breath-hold: Cine angiography with phase-sensitive fat suppression (CAPS),” *Magnetic Resonance in Medicine*, 2005, vol. 54, no. 4, pp. 833–840
- J. Park, A. C. Larson, Q. Zhang, O. Simonetti, and D. Li, “High-resolution steady-state free precession coronary magnetic resonance angiography within a breath-hold: Parallel imaging with extended cardiac data acquisition,” *Magnetic Resonance in Medicine*, 2005, vol. 54, no. 5, pp. 1100–1106

- J. Park, Q. Zhang, V. Jellus, O. Simonetti, and D. Li, “Artifact and noise suppression in GRAPPA imaging using improved k-space coil calibration and variable density sampling,” *Magnetic Resonance in Medicine*, 2005, vol. 53, no. 1, pp. 186–193
- X. Bi, J. Park, A. C. Larson, Q. Zhang, O. Simonetti, and D. Li, “Contrast-enhanced 4D radial coronary artery imaging at 3.0 T within a single breath-hold,” *Magnetic Resonance in Medicine*, 2005, vol. 54, no. 2, pp. 470–475
- J. Park, R. McCarthy, and D. Li, “Feasibility and performance of breath-hold 3D true-FISP coronary MRA using self-calibrating parallel acquisition,” *Magnetic Resonance in Medicine*, 2004, vol. 52, no. 1, pp. 7–13
- H. Merte, J. Park, W. W. Shultz, and R. B. Keller, “Criteria for approximating certain microgravity flow boiling characteristics in earth gravity,” *Annals of the New York Academy of Sciences*, 2002, vol. 974, no. 1, pp. 481–503

PATENTS

- J. Park Magnetic resonance imaging device and method for generating image using same, 2017, USA US9772390
- J. Park, H. Lee, Apparatus and method for magnetic resonance image processing, 2017, USA US9804244
- J. Park, H. Kim, Non-contrast enhanced magnetic resonance angiography for background and venous suppression, 2017, Republic of Korea, 1020164220000
- J. Park, H. Kim, Non-contrast enhanced magnetic resonance angiography for signal enhancement and fat-induced background suppression, 2017, Republic of Korea, 1019580930000
- J. Park, E. Lim, Fast spin echo for simultaneous multi-slice imaging, 2017, Republic of Korea
- J. Park, E. Lim, Artifact suppression in mixed band fast spin echo, 2017, Republic of Korea
- J. Park, H. Lee, Extraction of model-based z-spectrum, 2016, Republic of Korea, 1012821240000
- J. Park, H. Maeng, Dynamic tagging magnetic resonance imaging, 2016, Republic of Korea, 1017845020000
- J. Park, S. Park, Method and apparatus of signal multiplexing magnetic resonance imaging, 2015, Republic of Korea, PCT,
- J. Park, E. Lim, Model-based magnetic resonance angiography, 2015, Republic of Korea, PCT, 1017971410000
- J. Park, S. Park, Subspace projection based 4D dynamic magnetic resonance angiography, 2015, Republic of Korea, PCT
- J. Park, S. Park, Adaptive dynamic parallel magnetic resonance imaging, 2015, Republic of Korea
- J. Park, S. kim, Non-cartesian chemical exchange saturation transfer imaging, 2015, Republic of Korea

- J. Park, H. Lee, Simultaneous mapping of tissue relaxation and electrical conductivity, 2015, Republic of Korea
- J. Park, S. Park, Method and apparatus for real-time dynamic parallel MRI, 2014, Republic of Korea; DP-2014-0028
- J. Park, H., Lee, Method and apparatus for steady state free precession conductivity mapping, 2014, Republic of Korea/USA, DP-2014-0017
- J. Park, H. Lee, Method and apparatus for ultrafast z-spectrum encoding based magnetic field mapping, 2014, Republic of Korea/USA, DP-2014-0031
- J. Park, S. Park, Method and apparatus for feature-optimized compressed sensing MRI, 2014, Republic of Korea/USA, DP-2014-0036
- J. Park, S. Park, Method and apparatus for magnetic resonance image processing; 2013, Republic of Korea, No. 10-2013-0035579
- J. Park, H. Kim, Method and apparatus of robust magnetic resonance susceptibility imaging; 2013, Republic of Korea; No. 10-2013-0035267
- J. Park, S. Park, multi-coil based composite convolution interpolation using multiple high pass filters and a single low pass filter, 2012, Republic of Korea, No.10-2012-0049779
- J. Park, S. Park, Each coil convolution interpolation using multiple high pass filters and a single low pass filter, 2012, Republic of Korea, No. 10-2012-0049780
- J. Park, S. Park, Method and apparatus of constrained frequency domain reconstruction, 2012, Republic of Korea, No. 10-2012-0039964
- J. Park, H. Lee, Method and apparatus of selective gray matter imaging, 2012, Republic of Korea/USA, No. 10-2012-0035696
- J. Park, H. Lee, Rapid combo acquisition for fluid-attenuated imaging, 2012, Republic of Korea/USA, No. 10-2012-0032492
- J. Park, H. Kim, Method and apparatus of fast and low-energy hybrid magnetic resonance imaging, 2012, Republic of Korea, No. 10-2012-0021249
- J. Park, S. Choi, Method and apparatus of image de-noising for metal artifact correction imaging, 2012, Republic of Korea, No. 10-2012-0006051
- J. Park, S. Park, Method and apparatus of adaptive self-calibrating multi-coil parallel magnetic resonance imaging, 2010, Republic of Korea, No. 10-2010-0088394 (Transfer to Scimedix)
- J. Park, E.Y. Kim, Method and apparatus of highly selective tumor imaging, 2009, Republic of Korea, No. 10-2009-0100894
- J. Park, Method and magnetic resonance system to determine the phase position of magnetization, 2008, Germany/USA/China, No. 10-2008-032-155.9
- J. Park, Turbo spin echo imaging sequence with long echo trains and optimized T1 contrast, 2007, Germany/USA/China, No. 10 2007 021 719.8
- J. Park, Magnetic resonance imaging method and apparatus with phase sensitive fluid suppression, 2008, Germany/USA, 10 2008 046 022.2

- J. Park, Method and magnetic resonance system to excite nuclear spins in a subject, 2008, Germany/USA, No. 10 2008 032 155.9