

Curriculum Vitae

Junghun Cho

Assistant Professor
Biomedical Engineering, SUNY Buffalo
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EDUCATION

PhD: Cornell University, Biomedical Engineering	2014-2019
Thesis: Biophysics model improvement in MRI: cerebral metabolic rate of oxygen Advisor: Yi Wang, PhD	
MS: University of Wisconsin Madison, Physics	2009-2010
BS: University of Michigan Ann Arbor, Physics	2006-2008

PROFESSIONAL EXPERIENCE

Assistant Professor, Biomedical Engineering	9/2022- present
The State University of New York at Buffalo (SUNY Buffalo), NY	
Postdoctoral Associate, Radiology	1/2020-7/2022
Weill Cornell Medicine	

GRANTS

Current Funding

1. **R01NS136369**, MRI-based quantitative mapping of oxygen extraction fraction in MS, PI: Junghun Cho, 04/01/2024-03/31/2029, NIH NINDS, \$1,773,282
2. **R00NS123229**, Development and validation of MRI mapping of brain oxygen metabolism for clinical use, PI: Junghun Cho, 07/15/2023-06/30/2026, NIH NINDS, \$746,999

Completed Funding

1. K99NS123229, Development and validation of MRI mapping of brain oxygen metabolism for clinical use, PI: Junghun Cho, 07/15/2021-06/30/2023, NIH NINDS, \$183,107

AWARDS

2022	ISMRM "Summa cum laude" merit award
2021 July	K99/R00 Career Development Award (NIH NINDS, 2021-2026): Development and validation of MRI mapping of brain oxygen metabolism for clinical use
2021	ISMRM "Summa cum laude" merit award Best Abstract Award - 1 st place in ISMRM PET/MRI Study Group Meeting. Best Abstract Award - 3 rd place in ISMRM Electro-Magnetic Study Group Meeting
2020	Editor's Pick for MRM publication ISMRM "Magna cum laude" merit award
2018	ISMRM "Summa cum laude" merit award
2016-2018	Educational Stipend from the ISMRM
2008	University honors in the University of Michigan at Ann Arbor
2004-2006	Designated as Excellent Student in the Tokyo University of Agriculture and Technology
2004-2006	Korea-Japan Joint Government Scholarship

PUBLICATIONS

Google Scholar: <https://scholar.google.com/citations?user=MHJOggAAAAJ&hl=en>

ORCID: <https://orcid.org/0000-0002-0826-5463>

Thesis

“Biophysics model improvement in MRI: cerebral metabolic rate of oxygen”, PhD, Cornell University, 2019

Book Chapters

Cho, J., Dimov, A., (2023), MRI Physics and Image Acquisition in Jakimovski. D., & Zivadinov, R., *Handbook of Imaging in Multiple Sclerosis* (ISBN:9780323957397)

Journal Topic Editor

Cho, J., Lv, H, Guo, L., Wen, H, Li, J., (2023), Neuroimaging of brain structure-function coupling mechanism in neuropsychiatric disorders. *Frontiers in Neuroscience*

Refereed Journal Articles

Published: Total: 38, 1st author: 12[§], Corresponding author: 2*

- J1. Xie, Y., Zhang, S., Wu, D., Yao, Y., **Cho, J.**, Lu, J., Zhu, H., Wang, Y., Zhang, Y., and Zhu, W. (2024) The changes of oxygen extraction fraction in different types of lesions in relapsing-remitting multiple sclerosis: A cross-sectional and longitudinal study. *Neurol Sci.* PMID: 38492126
- J2. **Cho, J.**^{§,*}, Zhang, J., Spincemaille, P., Zhang, H., Nguyen T.D., Zhang, S., Gupta, A., and Wang, Y. (2024) Multi-echo complex quantitative susceptibility mapping and quantitative blood oxygen level-dependent magnitude (mcQSM+qBOLD or mcQQ) for oxygen extraction fraction (OEF) mapping. *Bioengineering.* (11) 131.
- J3. Yun, S., Lu, J., Li, Y., **Cho, J.**, Zhang, S., Zhu, W., Wang, Y. (2023) Spatiotemporal pattern of brain iron-oxygen metabolism in patients with Parkinson’s disease. *Eur Radiol.* 1-10.
- J4. Van Grinsven, E.E., De Leeuw, J., Siero, J.C.W., Verhoeff, J.J.C., Van Zandvoort, M.J.E., **Cho, J.**, Philippens, M.E.P., and Bhogal, A.A. (2023) Evaluating physiological MRI parameters in patients with brain metastases undergoing stereotactic radiosurgery – a preliminary analysis and case report. *Cancers.* (15) 4298
- J5. Biondetti, E., **Cho, J.**[§], Lee, Y. (2023) Cerebral oxygen metabolism from MRI susceptibility. *Neuroimage.* (276) ID 120189.
- J6. Zhang, Q., Sui, C., **Cho, J.**, Yang, L., Chen, T., Guo, B., Gillen, K.M.C., Li, J., Guo, L., Wang, Y. (2023) Assessing cerebral oxygen metabolism changes in patients with preeclampsia using voxel-based morphometry of oxygen extraction fraction maps in magnetic resonance imaging. *Korean J Radiol.* (24) 324-337.
- J7. Zhuang, H., **Cho, J.**, Chiang, G.C.Y, Kovanlikaya, I., Heier L.A., Dyke J.P., Wang, Y. (2023) Cerebral oxygen extraction fraction declines with ventricular enlargement in patients with normal pressure hydrocephalus. *Clin. Imaging.* (97) 22-27
- J8. Yang, L., **Cho, J.**, Chen, T., Gillen, K.M., Li, J., Zhang, Q., Guo, L., and Wang, Y (2022). Oxygen extraction fraction (OEF) assesses cerebral oxygen metabolism of deep gray matter in patients with pre-eclampsia. *Eur Radiol.* (32) 6058-6069
- J9. Chiang, G.C., **Cho, J.**[§], Dyke, J., Zhang, H., Zhang, Q., Tokov, M., Nguyen T., Kovanlikaya, I., Amoashiy, M., Leon, M.D., Wang, Y. Brain oxygen extraction and neural tissue susceptibility in cognitively impaired and intact elderly. *J Nurol Imaging.* (32) 697-709
- J10. Kim, J., Ngyuyen, T., Zhang, J., Gauthier, S., Marcille, M., Zhang, H., **Cho, J.**, Spincemaille, P., Wang, Y. (2022). Sub-second Accurate Myeline Water Fraction Reconstruction from FAST-T2 Data with 3D UNET. *Magn Reson Med* (87) 2979-2988
- J11. **Cho, J.**[§], Zhang, J., Spincemaille, P., Zhang H., Hubertus, S., Wen, Y., Jafari, R., Zhang, S., Nguyen T.D., Gupta, A., Wang, Y. (2022). QQ-NET-using deep learning to solve Quantitative Susceptibility Mapping and Quantitative Blood Oxygen Level Dependent magnitude (QSM+qBOLD or QQ) based Oxygen Extraction Fraction (OEF) mapping. *Magn Reson Med* (87) 1093-1637.

- J12. Li, J., Huang, W., Luo, X., Wen, Y., **Cho, J.**, Kovanlikaya, I., Gauthier S., Nguyen, T.D., Spincemaille, P., and Wang, Y. (2022). The Central Vein Sign in Multiple Sclerosis Lesions: Susceptibility Relaxation Optimization from a routine MRI Multiecho Gradient Echo Sequence. *J NeuroImaging* (32) 48-56.
- J13. **Cho, J.**[§], Nguyen, T., Huang, W., Sweeney, E., Luo, X., Kovanlikaya, I., Zhang, S., Gillen, K., Spincemaille, P., Guta, A., Gauthier, S., and Wang, Y. (2021). Brain oxygen extraction fraction mapping in patients with multiple sclerosis. *J Cereb Blood Flow Metab* (42) 338-348.
- J14. Cho, H., Lee, H., Gong, Y., Kim, Y., **Cho, J.**^{*}, and Cho., H. (2021). Quantitative susceptibility mapping (QSM) and R1 measurement: determination of the myelin volume fraction in the aging ex vivo rat corpus callosum. *NMR Biomed* e4645
- J15. Nanxi, S., Zhang, S., **Cho, J.**, Li, S., Zhang, J., Xie, Y., Wang, Y., Wenzhen, Z. (2021). Application of Cluster Analysis of Time Evolution for MRI Imaging-derived Oxygen Extraction Fraction Mapping: a promising strategy for the genetic profile prediction and grading of glioma. *Front Neurosci* (15) Article 736891
- J16. Wu, D., Zhou, Y., **Cho, J.**, Li, S., Qin, Y., Zhang, G., Yan, S., Xie, Y., Zhang, S., Zhu, W., and Wang, Y. (2021). The Spatiotemporal Evolution of MRI-Derived Oxygen Extraction Fraction and Perfusion in Ischemic Stroke. *Front Neurosci* Article 716031
- J17. **Cho, J.**[§], Spincemaille, P., Nguyen T.D., Gupta, A., and Wang, Y. (2021). Temporal clustering, tissue composition, and total variation for mapping oxygen extraction fraction using QSM and quantitative BOLD. *Magn Reson Med* (86) 2635-2646.
- J18. Wen, Y., Spincemaille, P., Nguyen, T., **Cho, J.**, Kovanlikaya, I., Anderson, J., Wu, G., Yang, B., Fung, M., Li, K., Kelley, D., Benhamo, N., and Wang, Y. (2021). Multiecho complex total field inversion method (mcTFI) for improved signal modelling in quantitative susceptibility mapping. *Magn Reson Med* (84) 2165-2178.
- J19. Jafari, R., Spincemaille, P., Zhang, J., Nguyen, T.D., Luo, X., **Cho, J.**, Margolis, D., Prince., MR, and Wang, Y. (2021). Deep neural network for water/fast separation: Supervised training, unsupervised training, and no training. *Magn Reson Med* (85) 2263-2277.
- J20. **Cho, J.**[§], Ma, Y., Spincemaille, P., Pike GB, and Wang, Y. (2021). Cerebral oxygen extraction fraction: Comparison of dual-gas challenge BOLD with CBF and challenge-free gradient echo QSM+qBOLD. *Magn Reson Med* (85) 953-961.
- J21. Ma, Y., Sun, H., **Cho, J.**, Mazerolle, E. L., Wang, Y., and Pike, B. (2020). Cerebral OEF quantification: A comparison study between quantitative susceptibility mapping and dual-gas calibrated BOLD imaging. *Magn Reson Med* (83) 68-82.
- J22. **Cho, J.**[§], Lee, J., An, H., Goyal, M.S., Su, Y., and Wang, Y. (2020). Cerebral oxygen extraction fraction (OEF): Comparison of challenge-free gradient echo QSM+qBOLD (QQ) with ¹⁵O PET in healthy adults. *J Cereb Blood Flow Metab* (41) 1658-1668.
- J23. Zhang, S., **Cho, J.**, Nguyen T.D., Spincemaille, P., Gupta, A., Zhu, W., and Wang, Y. (2020) Initial Experience of Challenge-Free MRI-based Oxygen Extraction Fraction Mapping of Ischemic Stroke at Various Stages: Comparison With Perfusion and Diffusion Mapping. *Front Neurosci* Article 535441.
- J24. Ma, Y., Mazerolle, E.L., **Cho, J.**, Sun, H., Wang, Y., and Pike, G.B. Quantification of brain oxygen extraction fraction using QSM and a hyperoxic challenge. *Magn Reason Med* (84) 3271-3285
- J25. Eskreis-Winkler, S., Simon, K., Reichman, M., Spincemaille, P., Nguyen, T.D., Kee, Y., **Cho, J.**, Christos, P.J., Drotman, M., Prince, M.R., Morris, E.A., and Wang, Y. (2019). Dipole modeling of multispectral signal for detecting metallic biopsy markers during MRI-guided breast biopsy: a pilot study. *Magn Reson Med* (83) 1380-1389.
- J26. **Cho, J.**[§], Zhang, S., Kee, Y., Spincemaille, P., Nguyen, T.D., Hubertus, S., Gupta, A., and Wang, Y. (2020). Cluster analysis of time evolution (CAT) for quantitative susceptibility mapping (QSM) and quantitative blood oxygen level-dependent magnitude (qBOLD)-based oxygen extraction fraction (OEF) and cerebral metabolic rate of oxygen (CMRO₂). *Magn Reson Med* (83) 844-857.
- J27. Hubertus, S., Thomas, S., **Cho, J.**, Zhang, S., Wang, Y., and Schad, L.R. (2019). Using an artificial neural network for fast mapping of the oxygen extraction fraction with combined QSM and quantitative BOLD. *Magn Reson Med* (82) 2199-2211.
- J28. Hubertus, S., Thomas, S., **Cho, J.**, Zhang, S., Wang, Y., and Schad, L.R. (2019). Comparison of gradient echo and gradient echo sampling of spin echo sequence for the quantification of the oxygen extraction fraction from a combined quantitative susceptibility mapping and quantitative BOLD (QSM+qBOLD) approach. *Magn Reson Med* (82) 1491-1503.
- J29. **Cho, J.**[§], Zhou, D., Kee, Y., Spincemaille, P., and Wang, Y. (2019). Quantitative susceptibility mapping of magnetic quadrupole moments. *Concepts in MR Part A. Article ID 7174937.*

- J30. **Cho J.**[§], Kee, Y., Spincemaille, P., Nguyen, T.D., Zhang, J., Gupta, A., Zhang, S., and Wang, Y. (2018). Cerebral metabolic rate of oxygen (CMRO₂) mapping by combining quantitative susceptibility mapping (QSM) and quantitative blood oxygenation level-dependent imaging (qBOLD). *Magn Reson Med* (80) 1595-1604.
- J31. Kee, Y., **Cho, J.**, Deh, K., Liu, Z., Spincemaille, P., and Wang, Y. (2018). Coherence enhancement in quantitative susceptibility mapping by means of anisotropic weighting in morphology enabled dipole inversion. *Magn Reson Med* (79) 1172-1180.
- J32. Zhang, J., **Cho, J.**, Zhou, D., Nguyen, T.D., Spincemaille, P., Gupta, A., and Wang, Y. (2018). Quantitative susceptibility mapping-based cerebral metabolic rate of oxygen mapping with minimum local variance. *Magn Reson Med* (79) 172-179.
- J33. Kee, Y., Liu, Z., Zhou, L., Dimov, A., **Cho, J.**, de Rochefort, L., Seo, J.K., and Wang, Y. (2017). Quantitative susceptibility mapping (QSM) algorithms: mathematical rationale and computational implementations. *IEEE TRANS BIO ENGIN* (64) 2531-2545.
- J34. Zhou, D., **Cho, J.**, Zhang, J., Spincemaille, P., and Wang, Y. (2017). Susceptibility underestimation in a high-susceptibility phantom: dependence on imaging resolution, magnitude contrast, and other parameters. *Magn Reson Med* (78),1080-1086
- J35. Jung, H., Jin, S., **Cho, J.**, Han, S., Lee, D., and Cho, H. (2016). UTE- $\Delta R_2 - \Delta R_2^*$ combined MR whole brain angiogram using dual-contrast superparamagnetic iron oxide nanoparticles. *NMR in Biomedicine* 29 (6), 690-701.
- J36. Han, S., **Cho, J.**, Jung, H., Suh, J., Kim, J., Kim, Y., Cho, G., and Cho, H. (2015). Robust MR assessment of cerebral blood volume and mean vessel size using SPION-enhanced ultrashort echo acquisition. *NeuroImage* (112), 382-389.
- J37. Jung, H., Park, B., Lee, C., **Cho, J.**, Suh, J., Park, J., Kim, Y., Kim, J., Cho, G., and Cho, H. (2014). Dual MRI T1 and T2* contrast with size-controlled iron oxide nanoparticles. *Nanomedicine: Nanotechnology, Biology, and Medicine* (10), 1679-1689.
- J38. Kim, H., **Cho, J.**[§], Kim, Y., Song, Y., Chun, S., Suh, J., Kim, J., Ryu, Y., Choi, S., Cho, H., and Cho, G. (2014). Response of the Primary Auditory and Non-Auditory Cortices to Acoustic Stimulation: A Manganese-Enhanced MRI Study. *PLoS One* (9): e90427

Proceedings Articles

Total: 33, 1st author: 15

- A1. **Cho, J.**, Spincemaille, P., Nguyen, T.D., Wang, Y. An improved data acquisition for robust oxygen extraction fraction (OEF) mapping using an integrative model of QSM and qBOLD (QSM+qBOLD=QQ), ISMRM 2023, Canada, abstract 4024.
- A2. Leeuw, J.D., **Cho, J.**, Grinsven E.V., Siero, J., Philippens, M., Bhogal, A. Effects of radiotherapy on tissue in patients with brain metastases in terms of OEF and CMRO₂, ISMRM 2023, Canda, abstract 3224
- A3. Sui, C., Zhang, Q., **Cho, J.**, Yang, L., Chen, T., Guo, B., Gillen, K.M., Li, J., Guo, L., Wang, Y. Assessing cerebral oxygen metabolism changes in preeclampsia using voxel-based morphometry of oxygen extraction fraction (OEF) maps in MRI, ISMRM 2023, Canada, abstract 2102.
- A4. Oros-Penusquens, A., Hau, L., **Cho, J.**, Bittner, N., Caspers, S., Wang, Y., Shah N.J. Pronounced gender and lifestyle effects in the oxygen extraction fraction (OEF) of the aging brain, ISMRM 2023, Canada, abstract 1303.
- A5. Wang, J., **Cho, J.**, Zhang, C., Wang, Y., and Yu, B. Assessment of age-related changes of oxygen extraction fraction of normal adults using QSM and quantitative BOLD, ISMRM 2022, UK, abstract 2940.
- A6. **Cho, J.**, Zhang, J., Spincemaille, P., Zhang, H., Nguyen, T.D., Gupta, A., and Wang, Y. Multi-echo Complex QSM+qBOLD (mcQQ) for Oxygen Extraction Fraction (OEF) mapping, ISMRM 2022, UK, abstract 0181.
- A7. **Cho, J.**, Nguyen, T.D., Sweeney, E.M., Spincemaille, P., Gupta, A., Gauthier S.A., and Wang, Y. Increased oxygen extraction fraction (OEF) following acute multiple sclerosis (MS) lesion formation is associated with increased myelin repair, ISMRM 2022, UK, abstract 0136.
- A8. **Cho, J.**, Gloria C.C., Dyke J., Zhang, H., Zhang, Q., Tokov, M., Nguyen T., Spincemaille, P., Kovanlikaya I., Amoashiy, M., Leon, M.D., and Wang, Y. Cerebral oxygen extraction fraction (OEF) mapping in cognitively impaired and intact elderly, ISMRM 2022, UK, abstract 2275.
- A9. Zhuang, H., **Cho, J.**, Chiang, G., Kovanlikaya, I., Heier, L., and Wang, Y. Brain Oxygen Extraction Fraction in Patients with Normal Pressure Hydrocephalus, ISMRM 2022, UK, abstract 3982.

- A10. **Cho, J.**, Lee, J., An, H., Goyal, M., Su, Y., and Wang, Y. Cerebral oxygen extraction fraction (OEF): comparison of challenge-free gradient echo QSM+qBOLD (QQ) with 15O PET in healthy adults, ISMRM 2021, virtual, abstract 0869.
- A11. **Cho, J.**, Spincemaille, P., Nguyen T., Gupta, A., and Wang, Y. Combined cluster analysis of time evolution and tissue type with total variation denoising (CCTV) for QQ-based oxygen extract fraction mapping, ISMRM 2021, virtual, abstract 1283.
- A12. Zhang, H., Zhang, J., **Cho, J.**, Gauthier, S., Spincemaille, P., Nguyen, T., and Wang Y. MS-voter: Learning Where to Vote for Confluent Multiple Sclerosis Lesion Separation, ISMRM 2021, virtual, abstract 2824.
- A13. **Cho, J.**, Ma, Y., Spincemaille, P., Pike B., and Wang, Y. Cerebral oxygen extraction fraction mapping: comparison of dual-gas challenge calibrated BOLD and challenge-free gradient echo QSM+qBOLD, ISMRM, 2020, virtual, abstract 1781
- A14. Wen, Y., Nguyen, T., **Cho, J.**, Spincemaille, P., and Wang Y. Improved signal modeling in Quantitative Susceptibility Mapping using multi-echo complex Total Field Inversion (mcTFI), ISMRM, 2020, virtual, abstract 3200.
- A15. Jafari, R., Spincemaille, P., Nguyen T., **Cho, J.**, Prince, M., and Wang, Y. Quantitative Susceptibility Mapping from Deep-Learning Based Reconstruction of Undersampled Gradient-Recalled Echo Data, ISMRM 2020, virtual, abstract 2596.
- A16. Guo, L., Zhou, L., Nguyen, T., Huang, W., **Cho, J.**, and Wang, Y. Quantitative susceptibility mapping of brain iron deposition in patients with cerebral small-vessel disease with cerebral microbleeds, ISMRM, 2020, virtual, abstract 1494.
- A17. **Cho, J.**, Nguyen, T., Huang, W., Zhang, S., Luo, X., Gauthier, S., Spincemaille, P., Guta, A., Wang, Y. Regional oxygen extraction fraction mapping (rOEF) of multiple sclerosis brains, ISMRM, 2020, virtual, abstract 0064.
- A18. **Cho, J.**, Lee, H., Zhang, J., Spincemaille, P., Zhang, H., Hubertus, S., Wen, Y., Jafari, R. Zhang, S., Nguyen, T., Gupta, A., and Wang, Y. Sparsity based machine learning algorithms for oxygen extraction mapping, ISMRM, 2020, virtual, abstract 3224.
- A19. Hubertus, S., Thomas, S., **Cho, J.**, Zhang, S., Wang, Y., and Schad, L. Using an Artificial Neural Network for Fast Mapping of the Oxygen Extraction Fraction with Combined QSM and qBOLD, ISMRM, 2020, virtual, abstract 1867.
- A20. **Cho, J.**, Zhang, S. Kee, Y., Spincemaille, P., Nguyen, T.D., Hubertus, S., Gupta, A., and Wang, Y. Data-driven regularized inversion (DRI) for improved QSM+qBOLD based CMRO2 Mapping: a feasibility study in healthy subjects and ischemic stroke patients, ISMRM, 2019, Canada, abstract 2724
- A21. Hubertus, S. Thomas, S., **Cho, J.**, Zhang, S., Wang, Y., and Schad, L.R. Comparison of Gradient Echo and Gradient Echo Sampling of Spin Echo Sequence for the Quantification of the Oxygen Extraction Fraction by Combining Quantitative Susceptibility Mapping and Blood Oxygen Level Dependency, ISMRM, 2019, Canada, abstract 2721
- A22. Hubertus, S., Thomas, S., **Cho, J.**, Zhang, S., Kovalikaya, I., Wang, Y., Schad, L.R. MRI-based Oxygen Extraction Fraction and Cerebral Metabolic Rate of Oxygen Mapping in High-Grade Glioma Using a combined Quantitative Susceptibility Mapping and Quantitative Blood Oxygenation Level-Dependent Approach, ISMRM, 2019, Canada, abstract 0391
- A23. Ma, Y., Sun, H., **Cho, J.**, Mazerolle, E., Wang, Y., and Pike, B. Whole-brain OEF quantification: a comparison study between QSM and dual-gas calibrated BOLD, ISMRM, 2019, Canada, abstract 3706
- A24. **Cho, J.**, Zhang, J., Spincemaille, P., Zhang, H., Hubertus, S., Zhang, S., Nguyen, T.D., Gupta, A., and Wang, Y. DeepQQ – using deep learning to solve Quantitative Susceptibility Mapping and Quantitative Blood Level Dependent magnitude (QSM+qBOLD or QQ) based Oxygen Extraction Fraction (OEF) and Cerebral Metabolic Rate of Oxygen (CMRO2) Mapping, QSM Workshop, 2019, Korea
- A25. **Cho, J.**, Zhang, S., Kee, Y., Spincemaille, P., Nguyen, T.D., Hubertus, S., Gupta, A., and Wang Y. Cluster analysis of time evolution (CAT) for Quantitative Susceptibility Mapping and Quantitative Blood Oxygen Level Dependent magnitude (QSM+qBOLD, QQ) based Oxygen Extraction Fraction (OEF) and Cerebral Metabolic Rate of Oxygen (CMRO2) Mapping, QSM Workshop, 2019, Korea
- A26. Hubertus, S., Thomas, S., **Cho, J.**, Zhang, S., Wang, Y., and Schad L.R. Using an Artificial Neural Network for Fast Mapping of the Oxygen Extract Fraction with combined Quantitative Susceptibility Mapping and Quantitative BOLD, QSM Workshop, 2019, Korea
- A27. **Cho, J.**, Kee, Y., Spincemaille, P., Nguyen, T.D., Zhang, J., Gupta, A., Zhang, S., and Wang, Y. Cerebral Metabolic Rate of Oxygen (CMRO2) mapping by a joint model of quantitative susceptibility mapping (QSM)-based method and quantitative BOLD (qBOLD), ISMRM, 2018, France, abstract 0179

- A28. Kee, Y., **Cho, J.**, Nguyen, T.D., Spincemaille, P., and Wang, Y. Eight fold acceleration for isotropic T2w and T2FAIAR imaging using Multi-Contrast Second-Order Directional Total Generalized Variation (dTGV), ISMRM, 2018, France, abstract 2054
- A29. Eskreis-Winkler, S., Simon, K., Kee, Y., **Cho, J.**, Nguyen, T.D., Spincemaille, P., Drotman, M., and Wang, Y. Feasibility of multispectral spin echo breast quantitative susceptibility mapping: an alternative to post-biopsy mammogram after MR-guided breast biopsy, ISMRM, 2018, France, abstract 4454
- A30. Zhang, S., **Cho, J.**, Nguyen T.D., Spincemaille, P., Zhu, W., and Wang Y. Initial experience using combined quantitative susceptibility mapping and quantitative bold oxygen level dependent imaging (QSM+qBOLD) oxygen extraction fraction for evaluation of acute ischemic stroke, ISMRM, 2018, France, abstract 4805
- A31. **Cho, J.**, Kee, Y., Spincemaille, P., Nguyen, T.D., Zhang, J., and Wang Y. Optimal Quantitative Mapping of Cerebral Metabolic Rate of Oxygen (CMRO2) by Combining Quantitative Susceptibility Mapping (QSM)-Based Method and Quantitative BOLD (QBOLD), ISMRM, 2017, Hawaii, USA, abstract 1110
- A32. Kee, Y., Spincemaille, P., **Cho, J.**, and Wang Y. Coherence Enhancement in QSM Via Anisotropic Weighting in Morphology-Enabled Dipole Inversion, ISMRM, 2017, Hawaii, USA, abstract 3674
- A33. **Cho, J.**, Zhou, D., Spincemaille, P., and Wang, Y. Quantitative susceptibility mapping of magnetic quadrupole moments, ISMRM, 2016, Singapore, abstract 1114

TECHNICAL PRESENTATIONS

Invited Talks

1. “Novel MRI Methodology for cerebral oxygen extraction fraction (OEF) mapping”, Seoul National University Bundang Hospital, Korea, 2024
2. “Oxygen Extraction Fraction (OEF) Mapping Using MRI”, Seoul St. Mary Hospital, Korea, 2024
3. “Novel MRI Methodology for Clinically Relevant Cerebral Oxygenation Measurement”, Ulsan National Institute of Science and Technology, Korea, 2022
4. “Novel MRI Methodology for Clinically Relevant Cerebral Oxygenation Measurement”, Ehwa Women’s University, Korea, 2022
5. “MRI methodology for clinically relevant tissue properties including oxygen extraction fraction (OEF)”, Daegu Gyeongbuk Institute of Science and Technology, Korea, 2022
6. “MRI Methodology for clinically relevant tissue properties including oxygen extraction fraction (OEF)”, Weill Cornell Medicine, Radiology, 2021
7. “MRI Methodology for clinically relevant tissue properties including oxygen extraction fraction (OEF)”, Rutgers University, BME, 2021
8. “MRI Methodology for clinically relevant tissue properties including oxygen extraction fraction (OEF)”, SUNY Binghamton, BME, 2021
9. “MRI Methodology for clinically relevant tissue properties including oxygen extraction fraction (OEF)”, Case Western Reserve University, BME, 2021
10. “Clinically Applicable MRI-based Brain Oxygen Extraction Fraction (OEF) Mapping”, SUNY Buffalo, BME, 2021
11. “QSM+qBOLD approach for OEF mapping”, Imaging Cerebral Physiology (ICP) Network Seminar, virtual, 2021
12. “Quantitative Susceptibility Mapping (QSM): Introduction and processing software”, Korea Basic Science Institute, virtual, 2021
13. “Quantitative Susceptibility Mapping (QSM): Concept, improvement, and application”, Korea Basic Science Institute and Ulsan National Institute of Science and Technology, Korea, 2019
14. “A novel MRI method for CMRO2 measurement”, Ulsan National Institute of Science and technology and Korea Institute of Oriental Medicine, Korea, 2019

Abstracts and Other Conference Presentations

1. “Multi-echo Complex QSM+qBOLD (mcQQ) for Oxygen Extraction Fraction (OEF) mapping”, ISMRM, London, England, UK, 2022
2. “Increased oxygen extraction fraction (OEF) following acute multiple sclerosis (MS) lesion formation is associated with increased myelin repair”, ISMRM, London, England, UK, 2022
3. “Cerebral oxygen extraction fraction (OEF): comparison of challenge-free gradient echo QSM+qBOLD (QQ) with ¹⁵O PET in healthy adults”, ISMRM, virtual, 2022
4. “Regional oxygen extraction of multiple sclerosis brains”, ISMRM, virtual, 2020

5. "Cluster analysis of time evolution (CAT) for Quantitative Susceptibility Mapping and Quantitative Blood Oxygen Level Dependent magnitude (QSM+qBOLD, QQ) based Oxygen Extraction Fraction and Cerebral Metabolic Rate of Oxygen (CMRO₂) mapping", QSM workshop, Seoul, Korea, 2019
6. "Cerebral Metabolic Rate of Oxygen (CMRO₂) mapping by a joint model of quantitative susceptibility mapping (QSM)-based method and quantitative BOLD (qBOLD)", ISMRM, Paris, France, 2018
7. "Optimal Quantitative Mapping of Cerebral Metabolic Rate of Oxygen (CMRO₂) by Combining Quantitative Susceptibility Mapping (QSM)-based Method and Quantitative BOLD (qBOLD)", ISMRM, Honolulu, USA, 2017
8. "Quantitative Susceptibility Mapping of Magnetic Quadrupole Moments", ISMRM, Singapore, 2016

MENTORING GRADUATE STUDENTS

Dissertations/Thesis in Progress

Ph.D. degrees

1. Renlong Yang, PhD, Aug 2023-present, degree expected May 2028
2. Arpita Misra, PhD, Aug 2023-present, degree expected May 2028
3. Praveena Elanghovan, PhD, Aug 2023-present, degree expected May 2028

M.S. degrees

4. Ada Ally, MS, Jan 2023-present, degree expected May 2024
5. Shamsher Khan, MS, Jan 2023-present, degree expected Dec 2023
6. Quinn Boyer, MS, Sep 2023-present, degree expected May 2025

B.S. degrees

7. Aranna Dey, BS, Jan 2023-present, degree expected May 2024

PROFESSIONAL ACTIVITIES

Leadership

Topic Editor, Frontiers in Neuroscience, 2022-2023

Other Service

Reviewer, AJNR, 2023-present
 Reviewer, NMR in Biomedicine, 2019
 Reviewer, Scientific Reports, 2021
 Reviewer, Frontiers in Neuroscience, 2022
 Reviewer, Phenomics, 2022

Membership in Professional and Honor Societies

ISMRM, Member, 2015-present

RESEARCH/TEACHING EXPERIENCE

MRI Research

1. Cerebral Oxygen Extraction Fraction (OEF) Mapping 2016-present
 - OEF model combination of QSM-based method and qBOLD (QSM+qBOLD=QQ)
 - QQ robustness improvement with machine and deep learning algorithms (CAT, CCTV, NET)
 - Validation of QQ with independent methods (Calibrated fMRI, ¹⁵O-PET)
 - Clinical application of QQ in dementia, stroke, multiple sclerosis, brain tumor.

2. Quantitative Susceptibility Mapping (QSM) Algorithm Development 2017-2018
 - Investigation of susceptibility underestimation
 - QSM coherence enhancement with anisotropic weighting in MEDI
3. QSM of Magnetic Quadrupole Moments 2014-2016
 - Derivation of quadrupole moments from Maxwell's equation
 - Validation in numerical simulations, phantom, human brains
4. MR Contrast Analysis using Physics Simulations 2013-2014
 - Dual contrast from a single contrast agent by adjusting MR parameters
 - Monte Carlo simulation for transverse relaxation change with MR contrast agents.
5. Neuroscience using Manganese-enhanced MRI 2011-2012
 - Investigation of response of the auditory and non-auditory cortices to acoustic stimulation

Physics Research (BS and MS)

6. Nacre Growth Pattern Modeling 05/2010-12/2010
 - Construction and validation of biophysical models for nacre growth patterns
7. High Energy Physics Experiment (ATLAS) 08/2008-04/2009
 - Design, construction, and test of muon signal detector prototypes for ATLAS upgrade
8. Dark Energy Survey 08/2007-04/2008
 - Set-up and test of various optical filters for transmission rate measurement
9. General Relativity 01/2007-04/2007
 - Derivation of the General Relativity

Teaching

SUNY Buffalo (Faculty)

2024 Spring BE304: Principles of Medical Imaging (BME core), 49 students (present)

2023 Fall BE400/500: Introduction to Biophysics Modeling in MRI, 17 students, evaluation: 4.2/5

2023 Spring BE500-SEM: Current Topics in Biomedical Engineering, evaluation: N/A

2022 Fall BE400/500: Introduction to Biophysics Modeling in MRI, 11 students, evaluation: 4.3/5

Cornell University (TA): 2014

Biomedical Engineering 6180: Principles of Magnetic Resonance Imaging

University of Wisconsin Madison (TA): 2009-2010

Physics 103: General Physics (Mechanics, heat, waves)

Physics 104: General Physics (Electricity and magnetism, light, optics, modern physics)

Physics 201: General Physics (Calculus-based mechanics)

PROFICIENCIES

Programming Languages:	MATLAB, Python
Neuroimaging tools:	FSL, SPM, FreeSurfer, ITK-SNAP, ImageJ
Tools:	Bash scripting, Microsoft Office, Adobe Illustrator
Operating systems:	Linux, Windows
MRI vendors:	3T, 1.5T Siemens, GE, Philips
Languages:	English, Japanese, Korean (native)