



Moss Zhao

Instructor, Neurosurgery

Bio

BIO

Dr. Moss Zhao is an Instructor at Department of Neurosurgery, Stanford University. He develops cutting-edge and clinically viable imaging technologies to improve the diagnosis and treatment of cerebrovascular diseases across the lifespan. His specific areas of expertise include physiological modeling, arterial spin labeling, Bayesian inference, PET/MRI, and artificial intelligence. His scientific contributions could significantly improve the early detection of strokes and dementia as well as enrich the knowledge of brain development in the first two decades of life.

Dr. Zhao received his DPhil at St Cross College of University of Oxford under the supervision of Prof. Michael Chappell. As an alumni mentor, he supports the career development of students of his alma mater. Since 2016, he has presented his work to more than 3000 delegates at international conferences and held leadership positions in professional societies. His research and teaching are supported by the American Heart Association, the National Institutes of Health, and the European Cooperation in Science and Technology.

ACADEMIC APPOINTMENTS

- Instructor, Neurosurgery
- Member, Maternal & Child Health Research Institute (MCHRI)

HONORS AND AWARDS

- Research Grant, American Syringomyelia and Chiari Alliance Project (2025)
- Pilot Grant, Society of Vascular and Interventional Neurology (2025)
- Team Science and Translational Medicine Grant, The Stanford Maternal and Child Health Research Institute (2024)
- Career Development Award, American Heart Association (2024)
- Pilot Grant, The Stanford Maternal and Child Health Research Institute (MCHRI) (2024)
- Second Century Early Faculty Independence Award, American Heart Association (2023)
- Postdoctoral Fellowship, American Heart Association (2021)
- Early Career Fellowship, The European Society for Magnetic Resonance in Medicine and Biology (ESMRMB) (2020)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Trainee Representative, ISMRM PET-MRI Study Group (2023 - present)
- FIT & Early Career Blogging Program, American Heart Association (2021 - present)
- Member of The Membership, Marketing, and Media Committee, The European Society for Magnetic Resonance in Medicine and Biology (ESMRMB) (2020 - present)

- Member of The Early Career Investigators Committee, The European Society for Magnetic Resonance in Medicine and Biology (ESMRMB) (2019 - present)
- Member of EU COST Action Glioma MR Imaging 2.0, European Cooperation in Science and Technology (COST) (2019 - present)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, University of Oxford , Engineering Science (Biomedical Engineering) (2019)
- Master of Science, The Chinese University of Hong Kong , Biomedical Engineering (2013)
- Bachelor of Science, Hong Kong Baptist University , Computer Science (2012)

LINKS

- My LinkedIn: <https://www.linkedin.com/in/moss-zhao-417260136/>
- My Google Scholar: <https://scholar.google.co.uk/citations?user=DpEdjgUAAAAJ&hl=en>
- My Twitter: <https://twitter.com/mosszhaodphil>

Publications

PUBLICATIONS

- **NeuroMix-DL: Improving imaging quality of a fast multiparametric MRI protocol using deep learning.** *European journal of radiology*
Sanaat, A., Decker, J. H., Hussein, R., Zhao, M. Y., Zaidi, H., Sprenger, T., Skare, S., Moseley, M., Zaharchuk, G.
2026; 199: 112795
- **Age-related changes in cerebral blood flow and arterial transit time in children: insights from single- and multi-delay ASL.** *Neuroradiology*
Prysiazniuk, Y., Duarte Armindo, R., Alexander, S., Moseley, M., Yeom, K. W., Otáhal, J., Kynčl, M., Tong, E., Petr, J., Zhao, M. Y., Steinberg, G. K.
2025
- **Comparative Evaluation of Single- and Multi-Delay Arterial Spin Labeling MRI in Preterm Neonates.** *NeuroImage*
Prysiazniuk, Y., Alexander, S., Armindo, R. D., Tong, E., Yeom, K. W., Otáhal, J., Kynčl, M., Moseley, M., Petr, J., Zhao, M. Y., Steinberg, G. K.
2025: 121511
- **Characterizing pre- and post-operative cerebral blood flow and transit time in pediatric moyamoya patients using multi-delay ASL and DSC MRI.** *Journal of cerebral blood flow and metabolism : official journal of the International Society of Cerebral Blood Flow and Metabolism*
Zhao, M. Y., Alexander, S., Lopez, C. A., Zhang, H., Morton, G., Armindo, R. D., Yeom, K. W., Tong, E., Soares, B. P., Lee, S., Moseley, M., Steinberg, G. K.
2025: 271678X251358979
- **Evaluating Vascular Hemodynamics in Cerebral Proliferative Angiopathy Using Advanced Arterial Spin Labeling MRI** *STROKE-VASCULAR AND INTERVENTIONAL NEUROLOGY*
Armindo, R., Zhao, M., Alexander, S., Tong, E., Yeom, K., Moseley, M., Vilela, P., Steinberg, G.
2025; 5 (2)
- **Medial amygdalar tau is associated with anxiety symptoms in preclinical Alzheimer's disease.** *bioRxiv : the preprint server for biology*
Li, J. S., Tun, S. M., Ficek-Tani, B., Xu, W., Wang, S., Horien, C. L., Toyonaga, T., Nuli, S. S., Zeiss, C. J., Powers, A. R., Zhao, Y., Mormino, E. C., Fredericks, et al
2024
- **Erratum to: Velocity-selective arterial spin labeling perfusion MRI: A review of the state of the art and recommendations for clinical implementation (Magn Reson Med. 2022; 88:1528-1547).** *Magnetic resonance in medicine*
Qin, Q., Alsop, D. C., Bolar, D. S., Hernandez-Garcia, L., Meakin, J., Liu, D., Nayak, K. S., Schmid, S., van Osch, M. J., Wong, E. C., Woods, J. G., Zaharchuk, G., Zhao, et al
2024
- **Recommendations for quantitative cerebral perfusion MRI using multi-timepoint arterial spin labeling: Acquisition, quantification, and clinical applications.** *Magnetic resonance in medicine*
Woods, J. G., Achten, E., Asllani, I., Bolar, D. S., Dai, W., Detre, J. A., Fan, A. P., Fernández-Seara, M. A., Golay, X., Günther, M., Guo, J., Hernandez-Garcia, L., Ho, et al
2024

- **Reproducibility of arterial spin labeling cerebral blood flow image processing: A report of the ISMRM open science initiative for perfusion imaging (OSIPI)_and the ASL MRI challenge.** *Magnetic resonance in medicine*
Paschoal, A. M., Woods, J. G., Pinto, J., Bron, E. E., Petr, J., Kennedy McConnell, F. A., Bell, L., Dounavi, M. E., van Praag, C. G., Mutsaerts, H. J., Taylor, A. O., Zhao, M. Y., Brumer, et al
2024
- **Turning brain MRI into diagnostic PET: 15O-water PET CBF synthesis from multi-contrast MRI via attention-based encoder-decoder networks.** *Medical image analysis*
Hussein, R., Shin, D., Zhao, M. Y., Guo, J., Davidzon, G., Steinberg, G., Moseley, M., Zaharchuk, G.
2023; 93: 103072
- **Early-Frame [18F]Florbetaben PET/MRI for Cerebral Blood Flow Quantification in Patients with Cognitive Impairment: Comparison to an [15O]Water Gold Standard.** *Journal of nuclear medicine : official publication, Society of Nuclear Medicine*
Fettahoglu, A., Zhao, M., Khalighi, M., Vossler, H., Jovin, M., Davidzon, G., Zeineh, M., Boada, F., Mormino, E., Henderson, V. W., Moseley, M., Chen, K. T., Zaharchuk, et al
2023
- **Segmenting Cervical Arteries in Phase Contrast Magnetic Resonance Imaging Using Convolutional Encoder-Decoder Networks** *APPLIED SCIENCES-BASEL*
Campbell, B., Yadav, D., Hussein, R., Jovin, M., Hoover, S., Halbert, K., Holley, D., Khalighi, M., Davidzon, G. A., Tong, E., Steinberg, G. K., Moseley, M., Zhao, et al
2023; 13 (21)
- **Editorial for "Altered Brain Function in Pediatric Patients With Complete Spinal Cord Injury: A Resting-State Functional MRI Study".** *Journal of magnetic resonance imaging : JMRI*
Duarte Armindo, R., Zhao, M. Y.
2023
- **Short- and Long-Term MRI Assessed Hemodynamic Changes in Pediatric Moyamoya Patients After Revascularization.** *Journal of magnetic resonance imaging : JMRI*
Zhao, M. Y., Tong, E., Duarte Armindo, R., Fettahoglu, A., Choi, J., Bagley, J., Yeom, K. W., Moseley, M., Steinberg, G. K., Zaharchuk, G.
2023
- **Longitudinal alterations of cerebral blood flow in high-contact sports.** *Annals of neurology*
Karimpoor, M., Georgiadis, M., Zhao, M. Y., Goubran, M., Moein Taghavi, H., Mills, B. D., Tran, D., Mouchawar, N., Sami, S., Wintermark, M., Grant, G., Camarillo, D. B., Moseley, et al
2023
- **Measuring Quantitative Cerebral Blood Flow in Healthy Children: A Systematic Review of Neuroimaging Techniques.** *Journal of magnetic resonance imaging : JMRI*
Zhao, M. Y., Tong, E., Duarte Armindo, R., Woodward, A., Yeom, K. W., Moseley, M. E., Zaharchuk, G.
2023
- **Effect of vitamin D supplementation on cerebral blood flow in male patients with adrenoleukodystrophy.** *Journal of neuroscience research*
Zhao, M. Y., Dahlen, A., Ramirez, N. J., Moseley, M., Van Haren, K., Zaharchuk, G.
2023
- **Advanced MR Techniques for Preoperative Glioma Characterization: Part 2.** *Journal of magnetic resonance imaging : JMRI*
Hangel, G., Schmitz-Abecassis, B., Sollmann, N., Pinto, J., Arzanforoosh, F., Barkhof, F., Booth, T., Calvo-Imirizaldu, M., Cassia, G., Chmelik, M., Clement, P., Ercan, E., Fernández-Seara, et al
2023
- **Advanced MR Techniques for Preoperative Glioma Characterization: Part 1.** *Journal of magnetic resonance imaging : JMRI*
Hirschler, L., Sollmann, N., Schmitz-Abecassis, B., Pinto, J., Arzanforoosh, F., Barkhof, F., Booth, T., Calvo-Imirizaldu, M., Cassia, G., Chmelik, M., Clement, P., Ercan, E., Fernández-Seara, et al
2023
- **Erratum to: Velocity-selective arterial spin labeling perfusion MRI: A review of the state of the art and recommendations for clinical implementation (Magn Reson Med. 2022; 88:1528-1547).** *Magnetic resonance in medicine*
Qin, Q., Alsop, D. C., Bolar, D. S., Hernandez-Garcia, L., Meakin, J., Liu, D., Nayak, K. S., Schmid, S., van Osch, M. J., Wong, E. C., Woods, J. G., Zaharchuk, G., Zhao, et al

2022

- **Revascularization improves vascular hemodynamics - a study assessing cerebrovascular reserve and transit time in Moyamoya patients using MRI.** *Journal of cerebral blood flow and metabolism : official journal of the International Society of Cerebral Blood Flow and Metabolism*
Zhao, M. Y., Armindo, R. D., Gauden, A. J., Yim, B., Tong, E., Moseley, M., Steinberg, G. K., Zaharchuk, G.
2022: 271678X221140343
- **Recent Technical Developments in ASL: A Review of the State of the Art.** *Magnetic resonance in medicine*
Hernandez-Garcia, L., Aramendia-Vidaurreta, V., Bolar, D. S., Dai, W., Fernandez-Seara, M. A., Guo, J., Madhuranthakam, A. J., Mutsaerts, H., Petr, J., Qin, Q., Schollenberger, J., Suzuki, Y., Taso, et al
2022
- **Velocity-selective arterial spin labeling perfusion MRI: A review of the state of the art and recommendations for clinical implementation.** *Magnetic resonance in medicine*
Qin, Q., Alsop, D. C., Bolar, D. S., Hernandez-Garcia, L., Meakin, J., Liu, D., Nayak, K. S., Schmid, S., van Osch, M. J., Wong, E. C., Woods, J. G., Zaharchuk, G., Zhao, et al
2022
- **Using arterial spin labeling to measure cerebrovascular reactivity in Moyamoya disease: Insights from simultaneous PET/MRI.** *Journal of cerebral blood flow and metabolism : official journal of the International Society of Cerebral Blood Flow and Metabolism*
Zhao, M. Y., Fan, A. P., Chen, D. Y., Ishii, Y., Khalighi, M. M., Moseley, M., Steinberg, G. K., Zaharchuk, G.
2022: 271678X221083471
- **Reliability of arterial spin labeling derived cerebral blood flow in periventricular white matter.** *Neuroimage. Reports*
Dolui, S., Fan, A. P., Zhao, M. Y., Nasrallah, I. M., Zaharchuk, G., Detre, J. A.
2021; 1 (4)
- **Cerebrovascular Reactivity Measurements Using Simultaneous 15O-Water PET and ASL MRI: Impacts of Arterial Transit Time, Labeling Efficiency, and Hematocrit.** *NeuroImage*
Zhao, M. Y., Fan, A. P., Chen, D. Y., Sokolska, M. J., Guo, J. n., Ishii, Y. n., Shin, D. D., Khalighi, M. M., Holley, D. n., Halbert, K. n., Otte, A. n., Williams, B. n., Rostami, et al
2021: 117955
- **Reproducibility of cerebrovascular reactivity measurements: A systematic review of neuroimaging techniques.** *Journal of cerebral blood flow and metabolism : official journal of the International Society of Cerebral Blood Flow and Metabolism*
Zhao, M. Y., Woodward, A., Fan, A. P., Chen, K. T., Yu, Y., Chen, D. Y., Moseley, M. E., Zaharchuk, G.
2021: 271678X211056702
- **Predicting PET Cerebrovascular Reserve with Deep Learning by Using Baseline MRI: A Pilot Investigation of a Drug-Free Brain Stress Test.** *Radiology*
Chen, D. Y., Ishii, Y., Fan, A. P., Guo, J., Zhao, M. Y., Steinberg, G. K., Zaharchuk, G.
2020: 192793
- **Quantification of cerebral perfusion and cerebrovascular reserve using Turbo-QUASAR arterial spin labeling MRI.** *Magnetic resonance in medicine*
Zhao, M. Y., Václavů, L., Petersen, E. T., Biemond, B. J., Sokolska, M. J., Suzuki, Y., Thomas, D. L., Nederveen, A. J., Chappell, M. A.
2019
- **A systematic study of the sensitivity of partial volume correction methods for the quantification of perfusion from pseudo-continuous arterial spin labeling MRI** *NEUROIMAGE*
Zhao, M. Y., Mezue, M., Segerdahl, A. R., Okell, T. W., Tracey, I., Xiao, Y., Chappell, M. A.
2017; 162: 384–97
- **Disease-Specific Target Gene Expression Profiling of Molecular Imaging Probes: Database Development and Clinical Validation** *MOLECULAR IMAGING*
Chan, L., Ngo, C., Wang, F., Zhao, M. Y., Zhao, M., Law, H., Wong, S., Yung, B.
2014; 13