CURRICULUM VITAE

Mahir Khan
mhkhan@usc.edu

Last revised: November 19, 2025

CURRENT POSITION:

Ph.D. Candidate (2022-Present)
Neural Plasticity and Neurorehabilitation Laboratory
Neuroscience Graduate Program, University of Southern California, Los Angeles, CA

RESEARCH INTERESTS:

Leverage advances in medical imaging and data-driven informatics to explore the relationship between neurobiology and functional status, ultimately contributing to longitudinal improvements in human ability

EDUCATION:

2022- **Ph.D. in Neuroscience** *(in progress)*
University of Southern California, Los Angeles, CA

2018-2019 **M.S. in Physiology and Biophysics**
Georgetown University, Washington, DC

2014-2018 **B.S. in Neuroscience**
University of Rochester, Rochester, NY

RESEARCH EXPERIENCE:

2023- **Graduate Research Assistant**
University of Southern California, Los Angeles, CA
Advisor: Dr. Sook-Lei Liew
Overview: Investigate biomarkers of stroke recovery using neuroimaging and neuroinformatics. Analyze cross-sectional and longitudinal neuroimaging and behavioral data to study the relationship between brain health and stroke damage. Train and validate machine learning and deep learning models for medical image segmentation and functional outcome prediction after stroke. Manage data intake, harmonization, and transfer for ENIGMA Stroke Recovery Working Group, an international research collaboration consisting of over 15 countries and 30 universities. Develop streamlined data management and image processing pipelines to standardize analysis of stroke neuroimaging. Develop accessible and informative web-based tools to facilitate data sharing between collaborators for secondary analyses. Advise undergraduate, Masters, and graduate level students in projects spanning neuroscience, data science, computer science, and occupational science.

2022-2023 **Rotating Graduate Student**
University of Southern California, Los Angeles, CA
Advisors: Dr. Sook-Lei Liew, Dr. Andrei Irimia, Dr. Hosung Kim

2019-2022 **Staff Research Associate**
Roland Henry Lab, University of California, San Francisco, San Francisco, CA
Advisor: Dr. Roland Henry
Overview: Designed and applied a novel algorithm to measure longitudinal spinal cord atrophy using structural MRI images and reduce variability compared to existing methods. Presented

methods and results to department leadership, who trialed the incorporation of longitudinal metrics into diagnostic and treatment evaluation for neurogenerative diseases, particularly multiple sclerosis. Developed calibration models to reduce measurement noise for cross-sectional and longitudinal MRI analysis. Advised 3 undergraduate students in summer and academic-year projects spanning neuroscience, data science, and computer science

2016-2018 **Undergraduate Research Assistant**
Tivarus Lab, University of Rochester, Rochester, NY (Sep 2016-May 2018)
Advisor: Dr. Madalina Tivarus
Overview: Developed an image analysis algorithm to produce a cerebrovascular reactivity (CVR) map using blood oxygen level dependent (BOLD) contrast imaging from resting-state fMRI. Investigated if CVR map from resting-state fMRI was comparable to maps produced from BOLD contrast imaging using external vasoactive stimuli. Wrote Python and MATLAB scripts that automated the conversion and processing of fMRI data for data analysis

2015-2018 **Undergraduate Research Assistant**
IDEA Lab, University of Rochester, Rochester, NY (Aug 2015-May 2018)
Advisor: Dr. Lisa Starr
Overview: Conducted in-person and over-the-phone interviews with adolescents and their parents to collect information on adolescent stressors. Coded interview information into objective data used for within- and across-subject analyses. Led initiative to review coder reliability of lifetime adversity ratings, which led to code revisions for nearly 20% of participants throughout longitudinal study and improved correlations with neurochemical measures

PUBLICATIONS:

2025 **Khan M.H.**, Chakraborty S., Ferris J.K., Boyd L.A., Khlif M.S., Brodtmann A., Borich M.R., Cole J.H., Cramer S.C., Fullmer N.H., Gumarang J.R., Kim H., Kumar A., Marin-Pardo O., Murphy S.M., Rosario E.R., Schambra H.M., Song G.C., Liew S.-L. (2025) Estimating white matter hyperintensities volume in individuals with stroke using T1-weighted images. *medRxiv*. doi:https://doi.org/10.1101/2025.10.22.25338564

Marin-Pardo O., **Khan M.H.**, Chakraborty S., Borich M.R., Castillo M., Cole J.H., Cramer S.C., Donnelly M.R., Fokas E.E., Fullmer N.H., Gumarang J.R., Hayes L., Kim H., Kumar A., Marks E.A., Rosario E.R., Schambra H.M., Schweighofer N., Song G.C., Taga M., Tavenner B.A., Weinstein C., Liew S.-L. (2025). Brain Age Is Longitudinally Associated With Sensorimotor Impairment and Mild Cognitive Impairment in Subacute Stroke. *Journal of the American Heart Association*, 14(20), e041603. doi:https://doi.org/10.1161/JAHA.125.041603

2024 **Khan M.H.,** Marin-Pardo O., Chakraborty S., Borich M.R., Castillo M., Cole J.H., Cramer S.C., Donnelly M.R., Fokas E.E., Fullmer N.H., Gumarang J.R., Hayes L., Kim H., Kumar A., Marks E.A., Rosario E.R., Schambra H.M., Schweighofer N., Song G.C., Liew S.-L. (2024). Greater lesion damage is bidirectionally related with accelerated brain aging after stroke. *medRxiv.* doi:https://doi.org/10.1101/2024.12.13.24319014

Chakraborty S., Choupan J., Marin-Pardo O., **Khan M.H.**, Barisano G., Tavenner B.P., Donnelly M.R., Abdullah A., Andrushko J.W., Banaj N., Borich M.R., Boyd L.A., Buetefisch C.M., Conforto A.B., Cramer S.C., Domin M., Dula A.A., Ferris J.K., Hordacre B., Liew S.-L. (2024). Larger perivascular space volume fraction is associated with worse post-stroke sensorimotor outcomes: An ENIGMA analysis. *medRxiv*. doi:https://doi.org/10.1101/2024.12.20.24319296

Park G., **Khan M.H.**, Andrushko J.W., Banaj N., Borich M.R., Boyd L.A., Brodtmann A., Brown T.R., Buetefisch C.M., Conforto A.B., Cramer S.C., Dimyan M., Domin M., Donnelly M.R., Egorova-Brumley N., Ermer E.R., Feng W., Geranmayeh F., Hanlon C.A., …, Liew S.-L., Kim H. (2024). Severe motor impairment is associated with lower contralesional brain age in chronic stroke. *medRxiv*. doi:https://doi.org/10.1101/2024.10.26.24316190

2022 Block V.J., Cheng S., Juwono J., Cuneo R., Kirkish G., Alexander A.M., **Khan M.H.,** Akula A., Caverzasi E., Papinutto N., Stern W.A., Pletcher M.J., Marcus G.M., Olgin J.E., Hauser S.L., Gelfand J.M., Bove R., Cree B.A.C., Henry R.G. (2022). Association of daily physical activity with brain volumes and cervical spinal cord areas in multiple sclerosis. *Multiple Sclerosis Journal*. 0(0). doi:10.1177/13524585221143726

PRESENTATIONS AND POSTERS:

2025 **Khan M.H.**, Marin-Pardo O., Chakraborty S., Barisano G., Borich M.R., Cole J.H., Cramer S.C., Fokas E.E., Fullmer N.H., Kim H., Rosario E.R., Schambra H.M., Schweighofer N., Winstein C.J., Liew S.-L (November 2025) “A composite measure of global brain health is associated with motor impairment variability in subacute stroke.” Society for Neuroscience Annual Meeting 2025, San Diego, CA. (Poster)

Khan M.H. (March 2025) “How caring for your brain can benefit you tomorrow.” NGP Symposium 2025, Los Angeles, CA. (Oral talk)

Khan M.H. (January 2025) “Brain age: a promising neuroimaging biomarker for stroke recovery.” USC Biokinesiology NeuroRehabilitation Seminar, Los Angeles, CA (Oral talk)

2024 **Khan M.H.**, Marin-Pardo O., Chakraborty S., Borich M.R., Castillo M., Cole J.H., Cramer S.C., Fokas E.E., Fullmer N.H., Gumarang J., Hayes L.X., Kim H., Kumar A., Marks E.A., Rosario E.R., Schambra H.M., Schweighofer N., Song G., Taga M., Winstein C.J., Zheng Z., Liew S.-L (October 2024) “Association of brain aging and focal brain damage in the subacute phase of stroke recovery.” Society for Neuroscience Annual Meeting 2024, Chicago, IL. (Oral talk - Nanosymposium; Poster)

Khan M.H.., Liew S.-L. (March 2024) “Validation of brain age predictions from synthetic T1-weighted MRIs generated from clinical MRIs in acute stroke patients.” NGP Symposium 2024, Los Angeles, CA. (Poster)

2023 **Khan M.H.,** Park G., Kim H. (March 2023) “Effects of hypoxic burden and sleep quality on brain age index in obstructive sleep apnea patients” Poster presented at NGP Symposium 2023, Los Angeles, CA. (Poster)

2018 **Khan M.H.,** Tivarus M., Zhuang Y., Wang H., Hussain A. (April 2018) “Measuring cerebrovascular reactivity in patients with brain disease using resting state fMRI.” Poster presented at Undergraduate Research Exposition, Rochester, NY. (Poster)

2017 **Khan M.H.,** Tivarus M., Zhuang Y., Hussain A. (April 2017) “Using BOLD to measure cerebrovascular reactivity.” Poster presented at Undergraduate Research Exposition, Rochester, NY. (Poster)

TEACHING EXPERIENCE:

2025 **Teaching Assistant**, NGP Coding Bootcamp
University of Southern California, Los Angeles, CA

2018 **Undergraduate Teaching Assistant**, NSC 203 – Lab in Neurobiology
University of Rochester, Rochester, NY

HONORS AND AWARDS:

2024 Trainee Professional Development Award, Society for Neuroscience
2022- Dornsife Fellow, University of Southern California
2017 Student Life Award for Campus Contributions, University of Rochester
2014-2018 Deans List, University of Rochester
2014 Wilder Trustee Scholarship, University of Rochester

MEMBERSHIPS:

2022- Society for Neuroscience