

Beibin Li

Curriculum Vitae

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Experience

- 2022 – Now **Senior Research Engineer**, *Microsoft Research*, Cloud Operation Research.
Advisor: Ishai Menache
Focused on optimizing supply chain and virtual machine allocation methods by integrating state-of-the-art deep learning techniques.
🏆 2023 MLSys Outstanding Paper Award: VM Allocation with Lifetime Prediction
- 2021 **Research Intern**, *Google*, Health AI.
Hosts: Ashish Bora, Pinal Bavishi
Developed computer vision and artificial intelligence models aimed at predicting the progression of vision loss using diabetic retinopathy images.
- 2020 **Research Intern**, *Microsoft Research*.
Advisor: Yao Lu, Srikanth Kandula
Solving the dataset shift problem by leveraging active learning, interactive learning, and generative methods. Applied to cardinality estimation and query optimization.
- 2015 – 2017 **Research Associate**, *Seattle Children's; Yale University*.
Advisor: Frederick Shic
Developed deep learning systems specialized for image and video analysis. Designed eye-tracking experiments, created a fixation identification algorithm, and conducted extensive data analysis.

Education

- 2022 **Ph.D.**, *Computer Science and Engineering*, University of Washington, Seattle,
Advisors: Linda Shapiro and Frederick Shic.
Thesis: Low-Resource Neural Adaptation: A Unified Data Adaptation Framework for Neural Networks
- 2015 **Bachelor of Science**, *Double Major: Computer Science, Mathematics*,
University of Michigan, Ann Arbor.

Awards

- 2017-2018 Faithful Steward Endowed Fellowship, University of Washington
2015-2017 Translational Technologies Fellowship, Yale University
2013-2015 University Honors, University of Michigan

Publications

Atyabi, A., Boccanfuso, L., Snider, J., Kim, M., Barney, E., Ahn, Y. A., Li, B., Dommer, K. J., & Shic, F. (2023). Large-scale investigations of aac usage patterns: Trends, autism, and stacked

autoencoders. *2023 IEEE 13th Annual Computing and Communication Workshop and Conference (CCWC)*, 851–859.

Atyabi, A., Shic, F., Jiang, J., Foster, C. E., Barney, E., Kim, M., Li, B., Ventola, P., & Chen, C. H. (2023). Stratification of children with autism spectrum disorder through fusion of temporal information in eye-gaze scan-paths. *ACM Transactions on Knowledge Discovery from Data*, 17(2), 1–20.

Barbalho, H., Kovalski, P., Li, B., Marshall, L., Molinaro, M., Pan, A., Cortez, E., Leao, M., Patwari, H., Tang, Z., et al. (2023). Virtual machine allocation with lifetime predictions. *Proceedings of Machine Learning and Systems*, 5.

Dong, M., Telesca, D., Sugar, C., Shic, F., Naples, A., Johnson, S. P., Li, B., Atyabi, A., Xie, M., Webb, S. J., et al. (2023). A functional model for studying common trends across trial time in eye tracking experiments. *Statistics in biosciences*, 15(1), 261–287.

Hochhauser, M., Dommer, K. J., Atyabi, A., Li, B., Ahn, Y. A., Aubertine, M., Kim, M., Corrigan, S. G., Pelphrey, K. A., & Shic, F. (2023). Comparing attention to biological motion in autism across age groups using eye-tracking. *Proceedings of the 2023 Symposium on Eye Tracking Research and Applications*, 1–3.

Li, B., Mellou, K., Zhang, B., Pathuri, J., & Menache, I. (2023). Large language models for supply chain optimization. *arXiv preprint arXiv:2307.03875*.

Liu, K., Li, B., Wu, W., May, C., Chang, O., Knezevich, S., Reisch, L., Elmore, J., & Shapiro, L. (2023). Vsgd-net: Virtual staining guided melanocyte detection on histopathological images. *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision*, 1918–1927.

Liu, R. P., Mellou, K., Gong, X.-Y., Li, B., Coffee, T., Pathuri, J., Simchi-Levi, D., & Menache, I. (2023). Efficient cloud server deployment under demand uncertainty. *Available at SSRN 4501810*.

Sajal, S. M., Marshall, L., Li, B., Zhou, S., Pan, A., Mellou, K., Narayanan, D., Zhu, T., Dion, D., Moscibroda, T., et al. (2023). Kerveros: Efficient and scalable cloud admission control. *17th USENIX Symposium on Operating Systems Design and Implementation (OSDI 23)*, 227–245.

Shic, F., Dommer, K., Benton, J., Li, B., Snider, J. C., Nyström, P., & Falck-Ytter, T. (2023). Remote, tablet-based assessment of gaze following: A nationwide infant twin study.

Wu, Q., Bansal, G., Zhang, J., Wu, Y., Zhang, S., Zhu, E., Li, B., Jiang, L., Zhang, X., & Wang, C. (2023). Autogen: Enabling next-gen llm applications via multi-agent conversation framework. *arXiv preprint arXiv:2308.08155*.

Xiao, L., Zhu, G., Huang, K., Wen, S., Feng, L., Li, B., Xiao, B., Liu, D., & Wang, Q. (2023). Memory characteristics in mesial temporal lobe epilepsy: Insights from an eye tracking memory game and neuropsychological assessments. *CNS Neuroscience & Therapeutics*.

Li, B., Lu, Y., & Kandula, S. (2022). Warper: Efficiently adapting learned cardinality estimators to data and workload drifts. *Proceedings of the 2022 International Conference on Management of Data*, 1920–1933.

Li, B., Snider, J. C., Wang, Q., Mehta, S., Foster, C., Barney, E., Shapiro, L., Ventola, P., & Shic, F. (2022). Calibration error prediction: Ensuring high-quality mobile eye-tracking. *2022 Symposium on Eye Tracking Research and Applications*, 1–7.

Marathe, K., Marasinou, C., Li, B., Nakhaei, N., Li, B., Elmore, J. G., Shapiro, L., & Hsu, W. (2022). Automated quantitative assessment of amorphous calcifications: Towards improved malignancy risk stratification. *Computers in biology and medicine*, 146, 105504.

Nofallah, S., Li, B., Mokhtari, M., Wu, W., Knezevich, S., May, C. J., Chang, O. H., Elmore, J. G., & Shapiro, L. G. (2022). Improving the diagnosis of skin biopsies using tissue segmentation. *Diagnostics*, 12(7), 1713.

Nuechterlein, N., Li, B., Shapiro, L., Cimino, P., & Holland, E. (2022). Genome-wide somatic copy number alteration signatures have prognostic implications for adult astrocytic glioma. *NEURO-ONCOLOGY*, 24, 9–10.

Shic, F., Naples, A. J., Barney, E. C., Chang, S. A., Li, B., McAllister, T., Kim, M., Dommer, K. J., Hasselmo, S., Atyabi, A., et al. (2022). The autism biomarkers consortium for clinical trials: Evaluation of a battery of candidate eye-tracking biomarkers for use in autism clinical trials. *Molecular Autism*, 13(1), 1–17.

Li, B., Lu, Y., Wang, C., & Kandula, S. (2021a). Cardinality estimation: Is machine learning a silver bullet. *3rd International Workshop on Applied AI for Database Systems and Applications (AIDB)*.

Li, B., Lu, Y., Wang, C., & Kandula, S. (2021b). Q-error bounds of random uniform sampling for cardinality estimation. *arXiv preprint arXiv:2108.02715*.

Li, B., Mercan, E., Mehta, S., Knezevich, S., Arnold, C. W., Weaver, D. L., Elmore, J. G., & Shapiro, L. G. (2021). Classifying breast histopathology images with a ductal instance-oriented pipeline. *2020 25th International Conference on Pattern Recognition (ICPR)*, 8727–8734.

Li, B., Nuechterlein, N., Barney, E., Foster, C., Kim, M., Mahony, M., Atyabi, A., Feng, L., Wang, Q., Ventola, P., et al. (2021). Learning oculomotor behaviors from scanpath. *Proceedings of the 2021 International Conference on Multimodal Interaction*, 407–415.

Liu, K., Mokhtari, M., Li, B., Nofallah, S., May, C., Chang, O., Knezevich, S., Elmore, J., & Shapiro, L. (2021). Learning melanocytic proliferation segmentation in histopathology images from imperfect annotations. *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition*, 3766–3775.

Mehta, S., Nuechterlein, N., Mercan, E., Li, B., Nofallah, S., Wu, W., Lu, X., Caspi, A., Rastegari, M., Elmore, J., et al. (2021). Applications of the espnet architecture in medical imaging. In *State of the art in neural networks and their applications* (pp. 117–131). Elsevier.

Nuechterlein, N., Li, B., Feroze, A., Holland, E. C., Shapiro, L., Haynor, D., Fink, J., & Cimino, P. J. (2021). Radiogenomic modeling predicts survival-associated prognostic groups in glioblastoma. *Neuro-oncology Advances*, 3(1), vdab004.

Nuechterlein, N., Li, B., Seyfioğlu, M. S., Mehta, S., Cimino, P. J., & Shapiro, L. (2021). Leveraging unlabeled data for glioma molecular subtype and survival prediction. *2020 25th International Conference on Pattern Recognition (ICPR)*, 7149–7156.

Wang, H., Li, B., Shic, F., Hu, B., & Wang, Q. (2021). Comparing robustness and efficiency of closed eye detection in images. *2021 6th International Conference on Image, Vision and Computing (ICIVC)*, 6–12.

Zhu, G., Wang, J., Xiao, L., Yang, K., Huang, K., Li, B., Huang, S., Hu, B., Xiao, B., Liu, D., et al. (2021). Memory deficit in patients with temporal lobe epilepsy: Evidence from eye tracking technology. *Frontiers in Neuroscience*, 15, 716476.

Jas, M., Achakulvisut, T., Idrizović, A., Acuna, D., Antalek, M., Marques, V., Odland, T., Garg, R. P., Agrawal, M., Umegaki, Y., et al. (2020). Pyglmnet: Python implementation of elastic-net regularized generalized linear models. *Journal of Open Source Software*, 5(47).

Li, B., Barney, E., Hudac, C., Nuechterlein, N., Ventola, P., Shapiro, L., & Shic, F. (2020). Selection of eye-tracking stimuli for prediction by sparsely grouped input variables for neural networks: Towards biomarker refinement for autism. *ACM Symposium on Eye Tracking Research and Applications*, 1–8.

Nuechterlein, N., Li, B., Fink, J., Haynor, D., Holland, E., Shapiro, L., & Cimino, P. (2020). Nimg-46. radiogenomic features predict clinically relevant genome-wide alteration signatures in glioblastoma. *Neuro-Oncology*, 22(Suppl 2), ii158.

Webb, S. J., Shic, F., Murias, M., Sugar, C. A., Naples, A. J., Barney, E., Borland, H., Hellemann, G., Johnson, S., Kim, M., et al. (2020). Biomarker acquisition and quality control for multi-site studies: The autism biomarkers consortium for clinical trials. *Frontiers in Integrative Neuroscience*, 13, 71.

Wu, W., Li, B., Mercan, E., Mehta, S., Bartlett, J., Weaver, D. L., Elmore, J. G., & Shapiro, L. G. (2020). Mlcd: A unified software package for cancer diagnosis. *JCO clinical cancer informatics*, 4, 290–298.

Li, B., Mehta, S., Aneja, D., Foster, C., Ventola, P., Shic, F., & Shapiro, L. (2019). A facial affect analysis system for autism spectrum disorder. *2019 IEEE International Conference on Image Processing (ICIP)*, 4549–4553.

Li, B., Nuechterlein, N., Barney, E., Hudac, C., Ventola, P., Shapiro, L., & Shic, F. (2019). Sparsely grouped input variables for neural networks. *arXiv preprint arXiv:1911.13068*.

Li, B., Atyabi, A., Kim, M., Barney, E., Ahn, A. Y., Luo, Y., Aubertine, M., Corrigan, S., St. John, T., Wang, Q., et al. (2018). Social influences on executive functioning in autism: Design of a mobile gaming platform. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, 1–13.

Atyabi, A., Li, B., Ahn, Y. A., Kim, M., Barney, E., & Shic, F. (2017). An exploratory analysis targeting diagnostic classification of aac app usage patterns. *2017 International Joint Conference on Neural Networks (IJCNN)*, 1633–1640.

Boccanfuso, L., Wang, Q., Leite, I., Li, B., Torres, C., Chen, L., Salomons, N., Foster, C., Barney, E., Ahn, Y. A., et al. (2016). A thermal emotion classifier for improved human-robot interaction. *2016 25th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, 718–723.

Li, B., Boccanfuso, L., Wang, Q., Barney, E., Ahn, Y. A., Foster, C., Chawarska, K., Scassellati, B., & Shic, F. (2016). Human robot activity classification based on accelerometer and gyroscope. *2016 25th IEEE international symposium on robot and human interactive communication (RO-MAN)*. Presented at the 2016 25th IEEE international symposium on robot and human interactive communication (RO-MAN), 423–424.

Li, B., Wang, Q., Barney, E., Hart, L., Wall, C., Chawarska, K., de Urabain, I. S., Smith, T. J., & Shic, F. (2016). Modified dbscan algorithm on oculomotor fixation identification. *Proceedings of the Ninth Biennial ACM Symposium on Eye Tracking Research & Applications*, 337–338.

Li, B., Wang, Q., Boccanfuso, L., & Shic, F. (2016). Optimality of the distance dispersion fixation identification algorithm. *Proceedings of the Ninth Biennial ACM Symposium on Eye Tracking Research & Applications*, 339–340.

Wang, Q., Barney, E., Wall, C., DiNicola, L., Foster, C., Ahn, Y., Li, B., Katarzyna, C., & Shic, F. (2016). Hybrid calibration for eye tracking: Smooth pursuit trajectory with anchor points. *Journal of Vision*, 16(12), 1355–1355.

Wang, Q., Boccanfuso, L., Li, B., Ahn, A. Y.-j., Foster, C. E., Orr, M. P., Scassellati, B., & Shic, F. (2016). Thermographic eye tracking. *Proceedings of the Ninth Biennial ACM Symposium on Eye Tracking Research & Applications*, 307–310.

Li, B., Boccanfuso, L., Valencia, S., Scassellati, B., & Shic, F. (2015). Background music and sound effects in human-robot interaction.

Academic Service

2022, 2023 **Committee Member.** ACM Symposium on Eye Tracking Research & Applications

2021, 2022 **Reviewer.** Computers in Biology and Medicine, Journal

2021 **Reviewer.** Mathematical Biosciences and Engineering, Journal

2021 **Reviewer.** Machine Learning in Computational Biology (NeurIPS)

2020 **Reviewer.** ACM European Conference on Information Systems (ECIS)

2020 **Reviewer.** International Conference on Mobile, Hybrid, and On-line Learning

2019, 2020 **Reviewer.** ACM SIGCHI Conference on Human Factors in Computing Systems

2018, 2020 **Reviewer.** ACM Symposium on Eye Tracking Research & Applications

Teaching

2021 CSE 577, TA, Advanced Computer Vision: Medical Imaging.

2020 CSE 599, TA, AI and the Brain.

2020 CSE 455, TA, Computer Vision.

2019 CSE 473, TA, Intro to Artificial Intelligence.

2018 CSE 546, TA, Machine Learning.

2015 EECS 376, TA, Theory of Computation