Beibin Li

Curriculum Vitae

Paul G. Allen Center, 185 Stevens Way
Seattle, WA, 98195
(901) 734-3790
beibin@uw.edu
beibinli.com

Research Interest

As a Ph.D. candidate at University of Washington, I focus on computer vision and machine learning. I work with Prof. Linda Shapiro and Prof. Frederick Shic to diagnose and intervene Autism Spectrum Disorder by using eye tracking, emotion detection, and augmented reality. I also work on medical data analysis including MRI, fMRI, and fNIRS. I want to create elegant mathematical and novel algorithmic methods to solve hard problems with few labeled data.

Education

Current **Ph.D. Candidate**, *Computer Science & Engineering*, University of Washington.

May 2015 **Bachelor of Science**, *Mathematics*, University of Michigan, Ann Arbor.

May 2015 **Bachelor of Science**, *Computer Science*, University of Michigan, Ann Arbor.

Experience

2016–Present **Research Associate in Computer Imaging**, SCITL,
Seattle Children's Research Institute.
Advisor: Frederick Shic, Ph.D.

2015–2016 **Research Fellow in Translational Technologies in Development**,
Technology Innovation Laboratory, Child Study Center, Yale University.
Advisor: Frederick Shic, Ph.D.
Designed eye-tracking experiments using Presentation, Python, PsychoPy, SR EyeLink, Eye Tribe, and Arduino for children with Autism Spectrum Disorder (ASD). Designed fixation identification algorithms for eye tracking technology, and use C++, Matlab, Python, and R to conduct post-hoc experiment data analysis. Communicated with collaborating sites to troubleshoot eye-tracking experiments in a large NIH-funded multi-site project. Implemented virtual reality project using Python and Unity.

2014–2015 **Research Fellow**, *Transportation Research Institution*,
University of Michigan, Ann Arbor.
Professor: Paul Green, Ph.D.
Used ISAT to design virtual roads for a driving recognition system experiment. Reviewed Literatures for speech rate, in order to design better hands-off voice control system for automobiles. Used JMP and R to analyze data from transportation research experiments. Taught ergometrics students using VisualBasic, Morae, Cogtool, IMPRINT, and other softwares to design user-friendly interface.

Awards

2017-2018 Computer Science & Engineering First-Year Fellowship, University of Washington

2015-2016 Translational Technologies Fellowship, Yale University

2013–2015 University Honors, University of Michigan

2010-2013 Presidential Scholarship, Rhodes College

Publications

2018 **Li, B.**, Atyabi, A., Kim, M., Barney, E., Ahn, A., Luo, Y., Aubertine, M., Corrigan, S., John, T., Wang, Q., Mademtzi, M., Best, M., & Shic, F. Social Influences on Executive Functioning in Autism: Design of a Mobile Gaming Platform. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems.* 2018

2017 Atyabi, A., **Li, B.**, Ahn, A., Kim, M., Barney, E., & Shic, F. An Exploratory Analysis Targeting Diagnostic Classification of AAC App Usage Patterns. In *IEEE International Joint Conference on Neural Networks (IJCNN 2017)*

2016 Wang, Q, , Barney, E., Wall, C., Dinicola, L., Foster, C., Ahn, Y., **Li, B.**, & Shic, F. Hybrid Calibration for Eye Tracking: Smooth Pursuit Trajectory with Anchor Points. In *Journal of Vision 16(12):1355. September 2016*

2016 Boccanfuso, L., Wang, Q., Leite, I., **Li, B.**, Torres, C., Chen, L., Salomons, N., Foster, C., Barney, E., Ahn, Y., Scassellati, B., & Shic, F.. A Thermal Emotion Classifier for Improved Human-Robot Interaction. In *IEEE International Symposium on Robot and Human Interactive Communication 2016 (RO-MAN 2016).*

2016 **Li, B.**, Boccanfuso, L., Wang, Q., & Shic, F.. Human Robot Activity Classification based on Accelerometer and Gyroscope. In *IEEE International Symposium on Robot and Human Interactive Communication 2016 (RO-MAN 2016).*

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

2016 **Li, B.**, Wang, Q., Barney, E., Hart, L., Wall, C., Chawarska, K., ... & Shic, F. (2016, March). Modified DBSCAN algorithm on oculomotor fixation identification. In *Proceedings of the Ninth Biennial ACM Symposium on Eye Tracking Research & Applications* (pp. 337-338). ACM.

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

Presentations

2017 **Li, B.** (2017, July. 5). Leveraging Usage Data behind Mobile Apps for Children with ASD. Center on Human Development and Disability, University of Washington, Seattle, WA.

2016 **Li, B.** (2016, July. 8). Human Robot Activity Classification for Children with Autism. Child Study Center, Yale University, New Haven, CT.

2016 **Li, B.** (2016, Feb. 26). Low Cost and Portable Eye Tracker. Center For Children With Special Needs, Glastonbury, CT.

2015 **Li, B.** (2015, Nov. 7). Background Music and Sound Effects in Human-Robot Interaction. *Northeast Robotics Colloquium 2015*. Worcester Polytechnic Institute, Worcester, MA.

Current Projects

2015–Present **NIH U19 MH108206-01**,
The Autism Biomarkers Consortium for Clinical Trials,
PI: McPartland, James.
Helped create eye-tracking experiments using Neurobs Presentation software, and improved eye-tracking calibration protocol. Designed a 73Hz system to measure and record light condition using Arduino and TSL2561 sensor. Built and set up eye-tracking system with SR EyeLink 1000 Plus eye trackers, web-cams, DVD recorders, and light meters. Analyze pupillary light reflex and other eye-tracking experiment data from children. Process and analyze 500 Hz eye tracking data collected across other sites. Troubleshoot eye tracking experiment and analysis across five sites, including Yale University, Boston Children's Hospital, University of Washington/Seattle Children's Research Institute, University of California (Los Angeles), and Duke University.

2015–Present **Simons Foundation 15-004376**,
Tracking Intervention Effects with Eye Tracking,
PI: Shic, Frederick, Ph.D.
Helped design experiments and counterbalance eye-tracking stimuli. Built and tested eye-tracking experiments using SR eye tracker. Analyzed iPad eye-tracking data using Cambridge face tracker (CLM-framework) and OpenCV in Matlab.

2015–Present **Hebrew University Eye-Tracking Project**.
Used PsychoPy to design eye-tracking experiments and Eye Tribe to collect data in Israel. Filtered and analyzed experimental data with Python and R. This project deploys portable eye-tracking experiments for children with ASD outside the United States.

Past Projects

May 2015 **StagePlay**, *Swift*.
Designed an iOS application for actors to practice their lines and to collaborate with their partners. Main features: line-by-line display, performance recording, and script editing. Compatible with iPhone and iPad.

Feb. 2015 **Course Scheduler**, *C++*.
Completed back-end website design for students to schedule the following year's courses. Designed and implemented algorithms in PHP, and imported 10,000 courses into SQL database. Coordinated with front-end developers.

Oct. - Dec. 2014 **Medieval World Game**, *C++*.
Developed a command line game for creating different characters and buildings. Applied C++ idioms and design patterns (Model View Controller, Composite, factory, etc.) so new features could be added easily.

Sept. - Oct. 2014 **Meeting Manager**, *C++*.
Designed a meeting management command line software by using classes for abstraction and encapsulation. Implemented linked-lists, arrays, and strings that behaved like build-in types; used strong exception guarantees. Managed dynamically allocated memory with copy and move construction and assignment.

Mar. 2014 **Stock Exchange**, *C++*.
Designed an electronic exchange simulator by using priority queue to store buyers' and sellers' bids. Stored stock information using customized Hash-Table.

Computer Skills

Advanced C++, Python, Matlab, R, Vim, C#, Unity

Intermediate html, LaTeX, Git, Swift, SQL, Visual Studio, XCode, Eclipse, Mathematica

Basic SPSS, JMP

Membership

Institute of Electrical and Electronics Engineers

Association for Computing Machinery

International Society for Autism Research

China Entrepreneur Network - Ann Arbor

Research Areas

- Computer Vision
- Optimization
- Machine Learning
- Artificial Intelligence