Beiyu Lin

Curriculum Vitae

Google scholar link

Assistant Professor
Department of Computer Science
The University of Nevada - Las Vegas
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Website: https://beiyulincs.github.io/

Education

2016-2020 **PhD, Computer Science**, Center for Advanced Studies in Adaptive Systems, Washington State University, Pullman, WA, Advisor: Diane J. Cook.
Topic: Population-level behavior analysis based on smart environment sensor data

2013–2015 **Master of Science in Mathematics**, Washington State University, Pullman, WA.

2011–2013 **Master of Science in Applied Math**, State University of New York, Stony Brook, NY.

2007–2011 **Bachelor of Science in Math and Applied Math**, Shanghai Maritime University, China.

Professional Experience

8/2021-now **Assistant Professor (tenure-track)**, Computer Science, University of Nevada-Las Vegas.

8/2020-2021 **Assistant Professor (tenure-track)**, Computer Science, University of Texas-Rio Grande Valley.

2015-2020 **Graduate Research Assistant**, Electrical Engineering and Computer Science, WSU.

Summer 2019 **Software Engineer Intern**, Dell EMC, Seattle, WA.
Wrote an analytic application of sensor data from cars in Brisbane, Australia. This application ingested streaming data, analyzed and predicted the traffic flow. The visualization is an hourly-based heat-map with location markers. When users click a marker, a bar chart will pop up with the predicted traffic flow.

Summer 2019 **Instructor**, School of Electrical Engineering and Computer Science, WSU.

Summer 2018 **Software Engineer Intern**, Honeywell, Atlanta, GA.
Worked on the Honeywell Aerospace Development Team for Low Altitude Authorization and Notification Capability Unmanned Aircraft System Service Supplier. Used Python and JavaScript to develop Honeywell USS Product, including developing data/user interface and authorization service. Helped out other projects, including flight plane engine, edge to cloud, memory leak and dashboard.

2014–2015 **Instructor**, Department of Mathematics, WSU.

2013–2014 **Teaching Assistant**, Department of Mathematics, WSU.

Honors and Awards

1/2022 People Choice Award for Young Professional Poster Competition, IEEE Rising Stars.

4/2021 Best Applied Data Science Paper Award, SIAM International Conference on Data Mining (SDM).
(SDM is one of the top 4 data mining conferences.)

10/2020 (Sole) PI: Google exploreCSR (funded by Google Research USD $18,000).
one of the 50 awardees around the world for the 2020 academic year

10/2020 (Sole) PI: Google Cloud COVID-19 research credits (funded by Google Cloud USD $1,500).

2020 Nomination for Graduate Student Instructor Excellence Award (a university-wide), GPSA, WSU.

2019 2^{nd} Place, 3-Minute Thesis Competition, Voiland College of Engineering & Architecture.

2019 The Computer Science Department Representative to Compete Three Minutes Thesis.

2018 Our paper was highlighted at IEEE Journal of Biomedical and Health Informatics (impact score 6.98).

2014 Award for Excellence Teaching Assistant (a university-wide), Graduate & Professional Students Association.

2011 Award for Outstanding Undergraduate Thesis, Shanghai Maritime University.

2010 Volunteer Star of the World Expo. International Registered Exhibitions, Shanghai, China.

2009 Outstanding Individual of China Ocean Shipping Company, Shanghai Maritime University.

2009 Excellent Summer Practice Paper Award, Shanghai Maritime University.

Scholarships (as a student)

2020 Professional Development Grants (funded by graduate & professional student association).

2020 Knowledge Discovery and Data Mining (KDD) (student registration award funded by NSF and SIGKDD).

2020 ACM Conference on Recommender Systems (registration fee waived).

2019 SIAM International Conference on Data Mining (funded by NSF and Intel), Canada.

2019 ACM-IMS Interdisciplinary Summit on the Foundations of Data Science (funded by NSF), CA.

2019 Grace Hopper Celebration of Women in Computing (registration fee was funded by GHC), FL.

2019 Analytics and Data Summit (registration fee was funded by Oracle Academy), CA.

2019 Strata Data Conference (funded by O'Reilly Media), CA.

2018 Google I/O, Mountain View, CA.

2017 Google Summer of Code Mentor Summit, Sunnyvale, CA.

2017 Grace Hopper Celebration (funded by Computer Science Department at WSU), FL.

2015 Mathematical Science Research Institute: Summer School on Incompressible Fluid Flows, CA.

2015 The Institute for Mathematics and its Applications: Workshop for Women in Analysis and PDE, MN.

2010-2011 2^{nd} Prize Scholarship, Shanghai Maritime University.

Grant Writing

7/2022 (Sole) PI: Hands-on-Training for College Students in Nevada STEM Program, Nevada NASA HE-HOT.

7/2022 (Sole) PI: Artificial Intelligence for Precision Medicine in Rare Genetic Diseases, NIPM, UNLV.

7/2022 (Sole) PI: Google exploreCSR.

7/2022 (Sole) PI: Plasma Wave Activity Recognition, *NIAC NASA*.

5/2022 Awarded (Sole) PI: Plasma Wave Activity Recognition, *One page summary for QEM/NASA*.

5/2022 PI: Iterative Design of Visual Analytics of Mobility during Transitions of Care for Older Adults, *Pre-application to Department of Energy*.

5/2022 PI: Management and Storage for Weather Data, *Pre-application to Department of Energy*.

4/2022 Awarded (Sole) PI: Early detection of hearing loss, *Troesh Center for Entrepreneurship and Innovation Research Grants, UNLV Internal*.

4/2022 Awarded Collaborator: Improving PolySubstance Use Measurement – Refinement and pilot-testing of a web-based Timeline FollowBack survey to capture self-report, event-level polysubstance use, *Faculty Opportunity Awards, UNLV Internal. PI: Dr. Timothy J. Grigsby, Department of Social and Behavioral Health; Mentor: Dr. Manoj Sharma, Department of Social and Behavioral Health, UNLV* .

3/2022 Not Awarded (Sole) PI: full proposal: human-in-the-loop plasma wave activity recognition, *NASA R3 CAN*. .

1/2022 (Sole) PI: letter of intent: human-in-the-loop plasma wave activity recognition, *NASA R3* .

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1/2022 Co-PI: Acquisition of Connected Autonomous Vehicles (CAV) Infrastructure to Support Cooperative Human-Robot Driving and Pedestrian Safety, *NSF MRI* .

12/2021 Co-I: Upper-room ultraviolet germicidal irradiation in elementary schools and the impact on SARS-CoV-2 and influenza pathogen levels, *NIH R21*. .

12/2021 Not Awarded Co-PI: Bridges between Differential Equations and Machine Learning in Epidemiological Modeling, *NSF Computational Math.* .

11/2021 Co-PI: A summary page for: Federal Procurement Performance Measurement Framework, *Center for Accelerating Operational Efficiency (CAOE).* .

02/2021 Co-PI: GAANN fellowships in Computer Science at UTRGV, *Education Proposal.* .

01/2021 PI: Understanding behavior differences between people with Alzheimer's disease and healthy populations, *Pilot Study Program for the Rio Grande Valley Alzheimer's Disease.*

01/2021 Collaborator: Robust human trajectory prediction and anomalous event detection,

10/2020 Letter of Intent: Understanding behavior differences between people with Alzheimer's disease and healthy populations, *Pilot Study Program for the Rio Grande Valley Alzheimer's Disease.* *(Letter of Intent was selected and invited to the next step: submit a full proposal.)*

10/2020 PI: Adaptive System for Web pages based on Mouse Movement Patterns, *Salesforce Research.*

10/2020 PI: Towards Adaptive Systems: Learning Human Behavior via Ambient Data, *Internal Proposal for Oak Ridge Associated Universities.*

10/2020 Co-PI: Towards Human-Robot Collaboration in Warehouses: Behavior Modeling via Multimodal Ambient Sensing, *Amazon Research.* .

09/2020 Co-PI: Engineering Research Center for Trustworthy Human and Intelligent Vehicle Collaborations, *NSF.* .

09/2020 PI: Modeling Human Routine Behavior via Deep Inverse Reinforcement Learning, *Google Cloud.*

08/2020 PI: Google exploreCSR, *Google Research.*

Teaching Experience

Spring 22	Instructor, Mining Internet of Things Data, UNLV	eval: 4.67/5
Fall 21	Instructor, Intro to Data Mining, UNLV (online)	eval: 4.78/5
Spring 21	Instructor, Computer Science I (C++), UTRGV (online)	eval: 4.83/5
Spring 21	Instructor, Computational Behavior Modeling, UTRGV (online)	eval: 4.49/5
Fall 20	Instructor, Computer Science I (C++), UTRGV (45 undergraduates; online)	eval: 4.51/5
Fall 20	Instructor, Seminar in Computer Science, UTRGV (27 graduates; online)	eval: 4.48/5
Summer 19	Instructor, Program Design and Development in C, WSU (10 undergraduates)	
Summer 15	Instructor, College Algebra, WSU (over 30 undergraduates)	
Fall14/Spring15	Instructor, Mathematics for Business and Economics, WSU (over 90 undergraduates)	

Students

Fall 2022 Serve as a Ph.D. Thesis Advisor for Jack Mackey in Computer Science

Summer 2022 Serve as an Advisor for 9 visiting students for doing summer research

Summer 2022 Serve as Ph.D.'s Thesis Committee for Maggie McMullin in Psychology

Summer 2022 Serve as Ph.D.'s Thesis Committee for Hannah Williams in Computer Science

Summer 2022 Serve as Master's Thesis Committee for Nicholas Lower in Computer Science

Summer 2022 Serve as Master's Thesis Committee for Paul Stanik in Computer Science

Spring 2022 Serve as Ph.D.'s Thesis Committee for Sai Kosaraju in Computer Science

Fall 2021 Serve as Master's Thesis Committee for Mikian Musser in Computer Science

Fall 2021 Guangyu Meng (M.S. at Washington University in St. Louis, intern in the lab)

Spring'21 Jason Hough, Lidia Garcia, Luis Tamborrell, Pedro Tinajero (B.S. at UTRGV, senior project)

2020-2021 Sonny Chauhan (B.S. at Rensselaer Polytechnic Institute, intern in the lab)
next place ⇒ Data Analyst Intern in the Simons Foundation.

08-10/2020 Yifeng Yu (B.S. at the University of Southern California, intern in the lab)

08-10/2020 Shariful Islam (incoming M.S. at UTRGV) *(submitted a student abstract to AAAI'21.)*

Fall 2020 Kaiqun Fu (Ph.D. at Virginia Tech, co-advising)

Fall 2020 Mingyuan Wang (Ph.D. at Florida State University, co-advising)

Fall 2020 Debangsha Sarkar (M.S. at University of British Columbia Okanagan Campus, co-advising)

Research Projects (as a student)

2019–2020 **Understanding Behavior Differences Among Subpopulations Using Inverse Reinforcement Learning**, *funded by National Institutes of Health (NIH).*

With a strong relationship between behavior habits and health status, we utilize a data-drive approach to understand behavior patterns and study the dynamic between situations and actions. The findings may allow technology to help improve people's habits and health status.

2018–2019 **Constructing Markov Models of Human Behaviors Based on Smart Home Sensor Data**, *funded by National Science Foundation (NSF); collaborated with College of Nursing.*

While pervasive computing technologies for observing human behavior are becoming mainstream, we construct stochastic models based on smart home sensor data among population subgroups as a purpose of discovering actionable routine strategies that are associated with better health status.

2017–2018 **Iterative Design of Visual Analytics for a Clinician-in-the-loop Smart Home**, *funded by National Institutes of Health (NIH); collaborated with clinicians, psychologists and nurses.*

With the increasing health needs of the coming "age wave", we design a clinician-in-the-loop visual interface, that provides clinicians with patient behavior patterns, derived from smart home data. The technology offers the potential to perform remote monitoring for supporting self-management.

2016–2018 **Designing an Ecologically-Valid Formal Model of Human Activity Patterns**, *funded by National Science Foundation (NSF).*

Formal modeling and analysis of human behavior is a popular topic in disciplines ranging from psychology to economics. We propose a formal model of indoor routine behavior based on automatically-sensed and recognized activities. These findings may be used to automate diagnoses and design customized behavioral interventions.

2015–2018 **Analyzing the relationship between human behavior and indoor air quality in smart homes**, *funded by Department of Energy (DOE) and Environmental Protection Agency Science To Achieve Results; collaborated with people from civil and environmental engineering.*

Because the quality of the air we experience inside and outside buildings may accompany behavior changes, we apply data science and machine learning technologies in smart home environments to understand the types of behavior that measurably impact indoor air quality.

Patent

2014 Glimm, James, Jimmie Goode, Beiyu Lin, Nicholas Pezolano, and Svetlozar Rachev. "Real time evaluation of financial returns based on nearly elliptical models." U.S. Patent Application 14/163,674, filed July 31, 2014.

Publications

2022 G. Meng, Q. Jiang, K. Fu, B. Lin, C. Lu, and Z. Chen. Early forecasting of the impact of traffic accidents using a single shot observation. *SIAM International Conference on Data Mining (SDM)acceptance rate of 27.8%*, 2022.

2022 G. Meng, Q. Jiang, K. Fu, B. Lin, C. Lu, and Z. Chen. Early forecast of traffic accident impact based on a single-snapshot observation. *AAAI Student Poster Session*, 2022.

2022 B. Lin, X. Jia, Chauhan, S., H. Xu, and X. Huang. Behavior modeling via cursor movement data. *IEEE Rising Stars Poster Competition (People Choice Award)*, 2022.

2021 B. Lin, X. Jia, and Z. Chen. Studying spread patterns of covid-19 based on spatiotemporal data,. *SIAM International Conference on Data Mining (SDM) Tutorial.*, 2021.

2021 X. Jia, B. Lin, J. Zwart, J. Sadler, A. Appling, S. Oliver, and J. Read. Graph-based reinforcement learning for active learning in real time: An application in modeling river networks. *SIAM International Conference on Data Mining (SDM), 2021, acceptance rate of 21.25% (Best Applied Data Science Paper Award).*, 2021.

2021 S. Ek, M. Curci, X. Yang, B. Lin, and H. Xu. Sentiment analysis of long-term social data during the covid-19 pandemic. *Int'l Conf on Internet Computing and Internet of Things (ICOMP)*, 2021.

2020 Beiyu Lin. Smart home residents' behavior analysis. *Academic Showcase, Pullman, Washington State University*, 2020.

2020 Beiyu Lin. Human location preferences via imitation learning. *Infrastructure and Construction Webinar - Urban Planning Session*, 2020.

2020 B Lin, D. Cook, and Schmitter-Edgecombe M. Using continuous sensor data to formalize a model of in-home activity patterns. *Journal of Ambient Intelligence and Smart Environments*, pages 1–19. IOS Press, 2020.

2020 B. Lin and D. Cook. Analyzing sensor-based individual and population behavior patterns via inverse reinforcement learning. *Sensors, volume 20, page 5207,*, 2020.

2019 Beiyu Lin. Population level behavior analysis and its applications in healthcare. *Ph.D. Forum at SIAM International Conference on Data Mining Doctoral Forum, Alberta, Canada*, 2019.

2019 Beiyu Lin. Constructing an ecologically-valid formal markovian model of human activity patterns. *General Poster Session at Grace Hopper Celebration, Orlando, FL*, 2019.

2019 Y. Huangfu, N. Lima, P. O'Keeffe, W. Kirk, B. Lamb, S. Pressley, B. Lin, D. J. Cook, V. Walden, and B. Jobson. Diel variation of formaldehyde levels and other vocs in homes driven by temperature dependent infiltration and emission rates. *Building and Environment*, volume 159, page 106153. Elsevier, 2019.

2018 A. Musser, B. Lin, D. Cook, B. Jobson, M. Kirk, N. Lima, P. O'Keeffe, S. Pressley, V. Walden, Y. Huangfu, and B. Lamb. Simulations of indoor air quality based on future climate conditions. 2018.

2018 A. Musser, B. Lin, D. Cook, B. Jobson, M. Kirk, N. Lima, P. O'Keeffe, S. Pressley, V. Walden, Y. Huangfu, and B. Lamb. The major role of temperature on indoor concentrations of air toxic vocs in 9 houses based on in-situ high time resolution measurements. 2018.

2018 A. Musser, B. Lin, D. Cook, B. Jobson, M. Kirk, N. Lima, P. O'Keeffe, S. Pressley, V. Walden, Y. Huangfu, and B. Lamb. Indoor air toxic gases levels in a net-zero energy house under multiple ventilation system settings. 2018.

2018 Beiyu Lin. Identifying and modeling the patterns of human activity routines. *Research Exposition at Graduate and Professional Student Association, Pullman, WA*, 2018.

2018 W. Kirk, M. Fuchs, Y. Huangfu, N. Lima, P. O'Keeffe, B. Lin, T. Jobson, S. Pressley, V. Walden, D. Cook, et al. Indoor air quality and wildfire smoke impacts in the pacific northwest. *Science and Technology for the Built Environment*, volume 24, pages 149–159. Taylor & Francis, 2018.

2018 A. Ghods, K. Caffrey, B. Lin, K. Fraga, R. Fritz, M. Schmitter-Edgecombe, C. Hundhausen, and D. J. Cook. Iterative design of visual analytics for a clinician-in-the-loop smart home. *IEEE journal of biomedical and health informatics*, volume 23, pages 1742–1748. IEEE, Highlight at the journal (link), 2018.

2017 B. Lin, Y. Huangfu, N. Lima, B. Jobson, M. Kirk, P. O'Keeffe, S. Pressley, V. Walden, B. Lamb, and D. J. Cook. Analyzing the relationship between human behavior and indoor air quality. *Journal of Sensor and Actuator Networks*, volume 6, page 13, 2017.

2013 Z. Sheng, B. Lin, and Zhang S. Testing unit roots of first-order autoregressive process with stable distributions errors. *Chinese Journal of Applied Probability and Statistics*, volume 29, pages 443–448, 2013.

Invited Talks

01/2021 Department of Health & Biomedical Sciences, the University of Texas Rio Grande Valley.
12/2020 Department of Surgery, School of Medicine, the University of Texas Rio Grande Valley.
10/2020 Computer Science Seminar, the University of British Columbia Okanagan Campus.
09/2020 Neuroscience Research Seminar, School of Medicine, the University of Texas Rio Grande Valley.
09/2020 Human–Computer Interaction Seminar, the University of Texas Rio Grande Valley.
09/2020 Open Problem in Computer Science Seminar, the University of Texas Rio Grande Valley.
09/2020 Society of Photographic Instrumentation Engineers, the University of Texas Rio Grande Valley.
04/2020 Population-level behavior analysis at Singapore Management University, Virginia Wesleyan University (both cancelled since already accepted an offer).
03/2020 Population-level behavior analysis at Zhejiang University at Ningbo (China;virtual), Shandong University of Science and Technology (China;virtual), Merrimack College, Colby College, University of Texas Rio Grande Valley, University of New Haven (virtual), Dominican University (virtual).
03/2020 Programming in C, Pomona College (cancelled).
03/2020 Support Vector Machine, University of Rutgers (virtual).
03/2020 Stack in C, University of Connecticut (virtual).
03/2020 Society of Women Engineers, Undergraduate Research Mixer Event, WSU.
10/2019 Guest lecture, Machine Learning and its Applications at School of Economic Sciences, WSU.
03/2019 Guest lecture, Support Vector Machine for the class Introduction to Machine Learning, WSU.
03/2019 Analysis of Sensor Data Using Oracle Advanced Analytics, Analytics and Data Summit, CA.

Media Coverage/Impact

11/2020 ValleyMorningStar (newspaper in Harlingen, TX): UTRGV wins computer exploring award
11/2020 BrownsvilleHerald (newspaper in Brownsville, TX): UTRGV wins computer exploring award
11/2020 The Monitor (newspaper in Starr and Hidalgo counties): UTRGV wins computer exploring award
11/2020 UTRGV Newsroom: UTRGV one of 50 institutions to earn Google exploreCSR award
07/2019 Journal of Biomedical and Health Informatics: Medical Informatics
06/2019 ScienceDaily: Researchers uncover indoor pollution hazards
06/2019 WSU Insider: Researchers uncover indoor pollution hazards
06/2019 Nexus Newsfeed: Researchers uncover indoor pollution hazards
07/2015 WSU Insider: Researchers look into a future life indoors

Volunteer

Fall 2018 Mentor, ACM-W (for a women student from a low socioeconomic family) at WSU
Summer 2018 Instructor, Black Girls CODE, Atlanta, GA
Summer 2018 Mentor, Honeywell STEM program for High School Teachers
Summer 2017 Mentor, Google Summer of Code, Anita Borg Institute

Professional Services

Panel / Grant Proposal Reviewer

National Science Foundation's (NSF) Directorate for Computer and Information Science and Engineering (CISE) Minority-Serving Institutions

DataKind: Reviewer for Google AI Impact Challenge

Organizer

IEEE SMC 2022 International Conference on Systems, Man, and Cybernetics

Program Committee

European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (PKDD), 2022

ACM International Conference on Web Search and Data Mining (WSDM), 2022

ACM International Conference on Web Search and Data Mining (WSDM), 2022

SIAM International Conference on Data Mining (SDM), 2022

International Conference on Intelligent Environments (IE), 2021, 2022

International Workshop on Big Data Reduction, IEEE – Big Data, 2021,2022

Web Mining and Content Analysis track, WWW, 2021

ACM Student Research Competition, SIGCSE 2021.

SmartStudents'19, a workshop of IEEE International Conference on Smart Computing 2019

Reviewer

Pervasive and Mobile Computing

IEEE Transactions on Artificial Intelligence

Sci - MDPI

International Conference on Human-Computer Interaction – INTERACT 2021

The ACM Transactions on Knowledge Discovery from Data

IEEE International Conference on Big Data

International Journal of Environmental Research and Public Health

Web Search and Data Mining (WSDM'21)

MDPI Sustainability

Sensors

Remote Sensing

Applied Sciences Journal from MDPI

International Conference on Human-Computer Interaction – INTERACT 2019

Journal of Scientific Research and Reports (Science Domain International)

IEEE Transactions on Big Data

Service at UNLV

Spring 22 Committee for AI/ML Minor Program at the College of Engineering

Spring 22 Search Committee for a new faculty search at the Department of Computer Science