



Muyang Lu, PhD

muyang0089@gmail.com
814-852-9347
Irvine, CA, 92618

Highlights

- Ph.D. from Penn State majoring in Transportation Engineering (Data Analysis).
- 5 years of experience in supervised & unsupervised ML models, statistic models & DNN models.
- Originally designed, trained, and deployed 3 AI products, successfully advanced them to release.
- Certified AWS Machine Learning, Data Analytics specialty, and DevOps professional engineer.
- Proficient with Python, Java, and R; plenty experience of with TensorFlow, Keras, Ski-Learn, etc.
- 10 prestigious journal publications, and 9 international academic conference presentations.

Objectives: Machine Learning Engineer, Data Analyst, Software Engineer (Full Time).

EDUCATION

- The Pennsylvania State University** (Civil Engineering) Sep. 2019 - Dec. 2022
Study: Research on Machine Learning and statistic techniques to improve traffic safety and efficiency. GPA: 3.82/4.0
- Beijing Jiaotong University** (Traffic and Transportation Management) Sep. 2016 - Jun. 2019
Study: Using Big Data and Machine Learning models to predict and optimize traffic systems. GPA: 3.38/4.0
- Chang'an University** (Transportation Planning and Management) Sep. 2012 - Jun. 2016
Study: Statistics, management, economics, and engineering. GPA: 3.38/4.0

WORK EXPERIENCES

- Software Engineer - Machine Learning / Bitus Labs LLC** Feb. 2023 - Present
Responsibility:
 - OmniBrian core engineer powering the intelligent & playful online Omnihorse racing game with **advanced AI models**.**Major Achievements:**
 - Originally designed an **AI-based horse running algorithm** for horse chasing interactions in an online video game.
 - Created a **GAN model** to generate and simulate realistic racing speed curves for digital horses.
 - Originally designed, trained, and deployed a **DNN model** for a digital AI horse breeding game, successfully pushing the project to **release status**.
 - Developed an **AI commentary algorithm** using **LSTM** and **ChatGPT API** for engaging real-time race commentary.
 - Conducted 11 interviews, and advanced three candidates for a senior engineer position.**Key Skillset:**
 - Keras, AWS, EC2, LSTM, DNN, GAN, ChatGPT PAI, PCA, Parallel computing, Python, Pandas, Sklearn, MySQL, Redis, etc.
- Research Assistant / The Pennsylvania State University** Sep. 2019 - Dec. 2023
Responsibility:
 - Research on **Machine Learning models** to build intelligent, reliable transportation infrastructure management plans.
 - Using **Data Mining** techniques to improve the safety and efficiency of bikes in a multi-modal transportation system.**Major Achievements:**
 - Implement sophisticated generalized gamma **statistic models** for asset **reliability analysis**; Automate the model **updating** as the new data comes in using **MCMC sampling** and **Bayesian updating pipeline**.
 - Introduced Random **Survival Forest (RSF)** and **survival SVM** models to transportation infrastructure management.
 - Developed **multi-objective optimization** for pavement M&R planning, estimated with a **genetic algorithm**.
 - Explore traffic modes complement and competition effects using data mining techniques; Implement geographically weighted negative binomial regression to explore **spatiotemporal correlations**.
 - Developed a **video stream ML pipeline**, trained and deployed a **DNN model** on an edge GPU for Donkey Cars.
 - Published **9 prestigious academic papers**, presented at 9 international conferences, achieved **Ph.D. in 3 years**.**Key Skillset:**
 - DNN, Object detection, RSF, Survival SVM, stochastic model, Reliability analysis, Survival SVM, Heuristic algorithm, etc.
- Researcher / Beijing Jiaotong University** Sep. 2016 - Jun. 2019
Responsibility:
 - Use **RBF network, SVM, PCA, and KNN** to do long-term, short-term, and real-time metro traffic flow forecasting.
 - Design the UI with rich **data visualization** to monitor the traffic status and display the traffic prediction in real-time from multidimensions; design a **relational database** to store and query stream traffic flow data in real-time.**Major Achievements:**
 - 1st price in GCBD Data Visualization Competition; 2nd price in GCBD International Big Data Mining Competition.**Key Skillset:**
 - RBF, SVM, Decomposition model, ARIMA, Data Mining, Visualization, UI design, Java, MySQL, JS, HTML5, CSS, ECharts, etc.

SKILLS

Problem-Solving Machine Learning



Teamwork Skills Data Visualization



Fast Learning Communication



ML techniques: BP Network

Convolutional Neural Network

Generative Adversarial Network

Long Short-Term Memory

Transfer Learning

Anomaly Detection

K-means Clustering

Deep Neural Network

Reinforce learning

Autoencoder

Objection Detection

ChatGPT API

Random Forset

Principal Component Analysis

Recursive Neural Network

Q-learning

Attention Machine

Image Segmentation

Promotes Engineering

K-Nearest Neighborhood

Bayes Reference, etc.

Programming: Python (5 years), Java (2 years), MATLAB (6 years), R (2 years), SQL (2 years), HTML5 (2 years), VBA.

Libraries: Pandas, Scikit-learn, SciPy, TensorFlow, Keras, Boto3, Lifelines, NumPy, Seaborn, Matplotlib, Foliage, etc.

Software: MySQL, Redis, GitHub, Tableau, ECharts, Spark, SageMaker, Glue DataBrew, QuickSight, AutoCAD, Office, etc.

CERTIFICATIONS

- Amazon – **AWS Certified Cloud Practitioner** (Val #: 02Q7VFM1SER1QY39, Exp: Nov. 2025)
- Amazon – **AWS Certified Machine Learning – Specialty** (Val #: 7TSYC571SEE1Q93D, Exp: Dec. 2025)
Deep learning architecting, Computer vision, Neural language processing, ML model deployment, Transfer learning, etc.
- Amazon – **AWS Certified Data Analytics – Specialty** (Val #: PJLR9F7KYBV1QZGL, Exp: Dec. 2025)
Massively parallel processing, Data analysis, Data visualization, Data Lake, Data Warehouse, Streaming, Data security, etc.
- Amazon – **AWS Certified DevOps Engineer – Professional** (Val #: LBH24CCK0JVEQ1G4, Exp: May. 2026)
Provisioning, operating, and managing highly available and scalable distributed application systems on AWS.

PUBLICATIONS

1. **M. Lu**, Jack Yu, Lauren Xiao, Alex Ming, “Autonomous Horse Running Algorithm for 2-D Trajectory Simulation in A Virtual Horse Racing Game”, In submission.
2. **M. Lu**, J. Hydock, A. Radlińska, and S. I. Guler, “Reliability Analysis of a Bridge Deck Utilizing Generalized Gamma Distribution,” J. Bridge Eng., vol. 27, p. 04022006, Jan. 2022.
3. **M. Lu**, S. I. Guler, “Comparison of Random Survival Forest with Accelerated Failure Time-Weibull Model for Bridge Deck Deterioration,” Transp. Res. Rec., p. 03611981221078281, Mar. 2022.
4. **M. Lu**, E. J. Traut, S. I. Guler, X. Hu “Comparing the Roles of Shared E-scooters and Bikes When Complementing and Competing with Public Transit,” J. Intell. Transp. Syst., Feb. 2023.
5. **M. Lu**, S. I. Guler, V. V. Gayah, “Multi-Objective Optimization of Maintenance, Rehabilitation and Reconstruction Decision Making Considering Safety,” Transp. Res. Rec., Accepted.
6. K. Wu, **M. Lu**, and S. I. Guler, “Modeling and Optimizing Bus Transit Priority along An Arterial: A Moving Bottleneck Approach,” Transp. Res. Part C Emerg., vol 121, p. 102873, Dec. 2020.
7. E. Yao, **M. Lu**, Y. Liu, L. Yuan, “Electric Bus Area Driving Plan Preparation Considering Charging Constraints,” J. South China Univ. Technol. (Nat. Sci.), vol. 47, no. 9, p. 68, Sep. 2019.
8. Y. Liu, E. Yao, **M. Lu**, and L. Yuan, “Regional Electric Bus Driving Plan Optimization Algorithm considering Charging Time Window,” Math. Probl. Eng., vol. 2019, p. e7863290, Oct. 2019.
9. **M. Lu**, H. Liu, S. I. Guler, “Impact Of Bikes on Traffic Efficiency Based on A Car-Bike Mixed Traffic Flow Modeling,” Transport Res B-meth, Under review.
10. **M. Lu**, V. V. Gayah, S. I. Guler, “Does the Shared Bike Cause More Crashes to Pedestrians and Cyclists? A case study based on New York City,” Transp. Res. Rec., Under review.
11. E. Yao, C. Chen, **M. Lu**, and Y. Zhou, “Short-term Passenger Flow Prediction for Urban Railway Transit Based on Change-point Model,” IOP Conf. Ser.: Earth Environ. Sci., vol. 587, p. 012102, Oct. 2020

AWARDS & HONORS

- **Mark E. and Claire L. Alpert Graduate Fellowship** 2021
- **Leo P. Russell Graduate Fellowship** 2021
- 18th Annual College of Engineering Research Symposium – Best Oral Presentation Award 2021
- **GCBD International Big Data Mining Competition – 2nd Prize** 2017
- **GCBD Data Visualization Competition – 1st Prize** 2017
- Urban Traffic Cup-National Graduate Science and Technology Competition – 1st Prize 2017
- Chang'an University – Graduate School Excellent Graduation Thesis 2017