Tony T. Li

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Education

2008-2015 **Ph.D. in Computational Physics,** University of Illinois at Chicago.

Research Area: *machine learning algorithms, Anomaly Detection, Deep Learning, Multivariate Statistical Modeling, Advanced Mechanics Modeling, and Machine Learning Applications, Signal Processing*.

2012-2013 **MS in Statistics,** University of Illinois at Chicago.
Master's Exam: High Pass.

2010-2012 **MS in Applied Mathematics,** University of Illinois at Chicago.
Master's Exam: High Pass.

2008-2011 **MS in Physics,** University of Illinois at Chicago.
Qualifying exam: All Pass.

Current Amazon Work Routine

• **Drive** team's ML goals and technical direction to pursue opportunities that make the inbound supply chain more efficient from both demand and supply perspectives.
• **Manage and track** the status of the cloud based machine learning projects, and **partner & collaborate** with **organization leaders and stakeholders** to help improve the level of performance of the team & organization.
• Develop **highly scalable** supply chain management pipelines leveraging deep learning and ML models on cloud **(AWS)**.
• **Build, lead, and mentor** a team of a data engineer, a junior data scientist and a junior business intelligence engineer to deliver the state-of-the-art Machine Learning (ML) based products to improve performance and efficiency of Amazon supply chain.
• **Identify new opportunities** for the larger organization & influence the appropriate people for staffing/prioritizing these new ideas .

8+ Years of Machine Learning Experience

08/2020-Now **Data Scientist II**, Amazon.com, Great Los Angeles Area.

• Amazon GES Hackathon 2021 1st place winner – Network Optimization Operations Research.
• Hire and develop science talent for Amazon Supply Chain Team by setting standard for scientific excellence and make decisions that affect and influence the big organization.
• Build and lead a team to deliver 3 the state of art machine learning based products to the L6, L7, and L8 level stakeholders. These customer-facing solutions improve the performance and the efficiency of the supply chain team.
• Lead a team of senior engineers and data scientists to conduct the inbound supply chain machine learning forecasting engine on **AWS**. This supply chain machine learning engine has been deployed into production and has been consumed by IScore Team stakeholders and Supply Chain Operation team stakeholders.
• Lead, design, develop, and deploy supply chain consumable and reusable modeling (e.g. universal plastic pallets) based on LSTM (**Keras, Pyspark, Redshift SQL, SageMaker, Tensorflow, CUDA GPU Computing**) into **AWS**. This model is accurately and effectively forecasting the supply and the demand of $100 million level items for 800+ Amazon warehouses.
• Research and develop objective recognition and detection modelings based on Yolo (**Computer Vision, Keras, Tensorflow, openCV**), this project has been awarded as the Inbound Supply Chain Org Hackthon Runner-Up .

05/2018-08/2020 **Senior Data Scientist II**, Cars.com, Great Chicago Area.

• Manage the process of applying data science on cars.com revenue generation, making tactical data science based digital marketing KPI with C-level stakeholders, and tracking and compiling data science performance reports.
• Lead a team of two data scientists and one machine learning engineer. Worked on search & recommendation, user/item understanding, and computer vision. [0]
• Lead team members' growth, achieved 4.5/5 evaluation score and one star new-hire.
• Launch multiple machine learning products and deployed them into AWS. .

10/2015-05/2018 **Senior Data Scientist**, Uptake Technologies, Great Chicago Area.

• Hold **4 U.S. machine learning patents** regarding unsupervised learning, **supervised learning**, anomaly detection in multivariate data, and remedy of software anomalies.
• Develop and deploy **machine learning anomaly detection** (MLAD) cloud computing platform, which monitors over 1 billion streaming readings per day. This anomaly detection engine has been deployed and detecting anomalous for **500+ wind turbines** all over the world [1] .

06/2015-08/2015 **Data Scientist (Intern)**, Futurewei Tech (Huawei Technologies USA), Great Chicago Area.

• **Hold 1 U.S. patent** [2] which illustrates a machine learning methodology to improve the anomaly detection rate. 98% TPR and 7.6% FPR were obtained by applying embodiment anomaly detection techniques to the KDD 99 datasets. The testing results outperform other known anomaly detection techniques.

Machine Learning Patents and Patent Applications

10/2015 **Methodology to Improve Anomaly Detection Rate**.
Zhibi Wang and **Tuo Li**, *Huawei Technologies, US Patent 62/236,745.*

09/2016 **Detection of Anomalies in Multivariate Data**.
Tuo Li *et al., Uptake Technologies, US Patent 63/382,639.*

10/2017 **Computer System and Method for Detecting Anomalies in Multivariate Data**.
Tuo Li *and James P Herzog, Uptake Technologies, U.S Patent Application Serial No.:15/788,622.*

11/2017 **Systems and Methods for Detecting and Remedying Software Anomalies**.
Yuan Tang, **Tuo Li**, *and James P Herzog., Uptake Technologies, U.S Patent 10/635,519.*

04/2018 **Computer System and Method for Creating a Supervised Failure Model**.
Tuo Li *et al., Uptake Technologies, US Patent 10/635,095.*

Data Science and Data Analysis Publications

08/2019 **Applications of Machine Learning Image Processing in Digital Marketing**.
Tuo Li, *https://tech.cars.com/applications-of-machine-learning-image-processing-in-digital-marketing-982ee296dc8a*

07/2015 **Density Functional Theory Analysis of Hexagonal Close-Packed Elemental Metal Photocathodes**.
Tuo Li, *B.L. Rickman, and W.A. Schroeder*, *Physical Review ST Accelerators and Beams 18.073401 (2015): 10.1103.*

03/2015 **Emission Properties of Group VIb Elemental Photocathodes**.
Tuo Li, *B.L. Rickman, and W.A. Schroeder*, *Journal of Applied Physics 117.13 (2015): 134901.*

02/2016 **Photoelectric Emission Properties of Photocathode Materials**.
Tuo Li, *Ph.D. thesis, University of Illinois at Chicago.*

04/2017 **PbTe(111) Sub-Thermionic Photocathode: A Route to High-Quality Electron Pulses**.
Tuo Li and W.A. Schroeder, *arXiv preprint arXiv:1704.00194 (2017).*

05/2017 **Nonparametric Modeling of Face-Centered Cubic Metal Photocathodes**.
Tuo Li and W.A. Schroeder, *arXiv preprint arXiv:1704.05371 (2017).*

11/2012 **Excited-state Thermionic Emission in III-Antimonides: Low Emittance Ultrafast Photocathodes**.
J.A.Berger, B.L. Rickman, **Tuo Li** *and W.A. Schroeder*, *Applied Physics Letters 101.19 (2012): 4103.*

11/2007 **Four Wave Mixing with Matter Waves**.
Tuo Li, *China Modern Education with Honor, 2007.*

Computer Skills

Programming	Python, R, Matlab, C++, Scala.
Data Tools	MySQL, PySpark, Redshift, SageMaker, ECS, ECR, EC2.
Others	AWS, RShiny, Rmarkdown, Bash, Git, Linux, LaTeX.