

YaGuang Li

CONTACT INFORMATION

Google Cloud AI
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RESEARCH INTERESTS

Machine learning; deep learning on graphs with application in transportation; spatiotemporal forecasting and recommendation

EDUCATION

University of Southern California, Los Angeles, California, USA
Department of Computer Science
Ph.D. in Computer Science, Aug. 2014 - May 2019, GPA: 3.95/4.0

- Advisors: Cyrus Shahabi, Yan Liu

University of Chinese Academy of Sciences, Beijing, China
Institute of Software
M.S in Computer Science, Sep. 2011 - Jul. 2014, Ranked Top 1%

- Advisor: Zhiming Ding

University of Science and Technology Beijing, Beijing, China
Department of Computer Science
B.Eng in Computer Science, Sep. 2007 - Jul. 2011, GPA: 3.75/4.0

- Advisor: Xu-Cheng Yin

REFEREED CONFERENCE PUBLICATIONS

Hongzhi Shi, Quanming Yao, Qi Guo, **YaGuang Li**, Lingyu Zhang, Jieping Ye, Yong Li, Yan Liu. Predicting Origin-Destination Flow via Multi-Perspective Graph Convolutional Network. *IEEE International Conference on Data Engineering*, (ICDE), 2020 (Research Track, Short Paper)

YaGuang Li*, Xu Geng*, Leye Wang, Lingyu Zhang, Qiang Yang, Yan Liu, Jieping Ye (*Equal Contribution). Spatiotemporal Multi-graph Convolution Network for Ride-hailing Demand Forecasting. *The Thirty-Third AAAI Conference on Artificial Intelligence (AAAI)*, 2019 (**Oral presentation**)

Hanpeng Liu, **YaGuang Li**, Michael Tsang, Yan Liu. CoSTCo: A Neural Tensor Completion Model for Sparse Tensors, *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2019 (Research Track, Oral Presentation)

Zahaib Akhtar, **YaGuang Li**, Ramesh Govindan, Emir Halepovic, Shuai Hao, Yan Liu, Subhabrata Sen. AViC: A Cache for Adaptive Bitrate Video. *The 15th International Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, 2019

Mingxuan Yue, **YaGuang Li**, Haoze Yang, Ritesh Ahuja, Yao-yi Chiang, and Cyrus Shahabi. DETECT: Deep Trajectory Clustering for Mobility-Behavior Analysis. *IEEE International Conference on Big Data (IEEE Bigdata)*, 2019

YaGuang Li, Kun Fu, Zheng Wang, Cyrus Shahabi, Jieping Ye, Yan Liu. Multi-task Representation Learning for Travel Time Estimation, *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2018 (Research Track)

YaGuang Li, Rose Yu, Cyrus Shahabi, Yan Liu. Diffusion Convolutional Recurrent Neural Network: Data-Driven Traffic Forecasting, *International Conference on Learning Representations (ICLR)*,

2018

Yijun Lin, Nikhit Mago, Yu Gao, **YaGuang Li**, Yao-Yi Chiang, Cyrus Shahabi, Jos Luis Ambite. Exploiting Spatiotemporal Patterns for Accurate Air Quality Forecasting using Deep Learning. *International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS)*, 2018

YaGuang Li*, Rose Yu*, Ugur Demiryurek, Cyrus Shahabi, Yan Liu (*Equal Contribution). Deep Learning: A Generic Approach for Extreme Condition Traffic Forecasting. *Proceedings of the Seventeenth SIAM International Conference on Data Mining (SDM)*, 2017 **Best Research Paper Nomination**

YaGuang Li, Han Su, Ugur Demiryurek, Bolong Zheng, Tieke He, Cyrus Shahabi. PaRE: A System for Personalized Route Guidance. *Proceedings of the 26th International Conference on World Wide Web (WWW)*, 2017

YaGuang Li, Han Su, Ugur Demiryurek, Bolong Zheng, Kai Zeng, Cyrus Shahabi. PerNav: A Route Summarization Framework for Personalized Navigation. *ACM International Conference on Management of Data (demonstration) (SIGMOD)*, 2016

Mohammad Asghari, Dingxiong Deng, Cyrus Shahabi, Ugur Demiryurek, **YaGuang Li**. Price-aware Real-time Ridesharing at Scale - An Auction-based Approach. *International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS)*, 2016

YaGuang Li, Dingxiong Deng, Ugur Demiryurek, Cyrus Shahabi, Siva Ravada. Towards Fast and Accurate Solutions to Vehicle Routing in a Large-Scale and Dynamic Environment. *14th International Symposium on Spatial and Temporal Databases (SSTD)*, 2015

Kuijen Liu, **YaGuang Li**, Zhiming Ding, Shuo Shang, Kai Zheng. Benchmarking big data for trip recommendation. *Int'l Conference on Computer Communication and Networks (ICCCN)*, 2014

YaGuang Li, Chengfei Liu, Kuijen Liu, Jiajie Xu, Fengcheng He, Zhiming Ding. On Efficient Map-matching According to Intersections You Pass By. *International Conference on Database and Expert Systems Applications (DEXA)*, 2013

Kuijen Liu, Bin Yang, Shuo Shang, **YaGuang Li**, Zhiming Ding. MOIR/uots: Trip recommendation with user oriented trajectory search. *International Conference on Mobile Data Management (demonstration) (MDM)*, 2013

Kuijen Liu, **YaGuang Li**, Fengcheng He, Jiajie Xu, Zhiming Ding. Effective Map-matching on the Most Simplified Road Network. *International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS) 2012*, **Contest Paper**

JOURNAL
PUBLICATIONS

YaGuang Li, Cyrus Shahabi. A Brief Overview of Machine Learning Methods for Short-term Traffic Forecasting and Future Directions. *ACM SIGSPATIAL Special*, 2018

Zhiming Ding, Bin Yang, Ralf Hartmut Güting, **YaGuang Li**. Network-Matched Trajectory-Based Moving-Object Database: Models and Applications. *IEEE Transactions on Intelligent Transportation Systems (TITS)*, 2015

PATENT

Shuai Hao, Subhabrata Sen, Emir Halepovic, Zahaib Akhtar, Ramesh Govindan, **YaGuang Li**. Adaptive Bitrate Video Cache. US Patent, Under Review

Haoming Guo, Zhiming Ding, Kuien Liu, Jiajie Xu, Huaiye Xu, **YaGuang Li**, Tianwei Zhang. Parallel Data Processing Method Based on Distributed Structure. CN Patent, CN103412897B, Issued 2017

WORKSHOP
PUBLICATIONS

YaGuang Li, Chuizheng Meng, Cyrus Shahabi, Yan Liu. Structure-informed Graph Auto-encoder for Relational Inference and Simulation, *International Conference on Machine Learning (ICML) Workshops on Learning and Reasoning with Graph-Structured Representations*, 2019

YaGuang Li, Rose Yu, Cyrus Shahabi, Yan Liu. Diffusion Convolutional Recurrent Neural Network: Data-Driven Traffic Forecasting. *The Thirty-first Annual Conference on Neural Information Processing Systems (NIPS) Time Series Workshop*, 2017, **Oral Presentation**

Rose Yu, **YaGuang Li**, Cyrus Shahabi, Ugur Demiryurek, Yan Liu. Extreme Traffic Forecasting: A Deep Learning Approach. Poster accepted to *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) workshop on Mining and Learning from Time Series*, 2016

Kuien Liu, **YaGuang Li**, Jian Dai, Shuo Shang, Kai Zheng. Compressing large scale urban trajectory data. *International Workshop on Cloud Data and Platforms (CloudDP@EuroSys)*, 2014

YaGuang Li, Kuien Liu, Jiajie Xu, Fengcheng He. An Efficient Map-Matching Mechanism for Emergency Scheduling and Commanding. *International Conference on Web-Age Information Management (WAIM) Workshops*, 2013

WORK
EXPERIENCE

Google Cloud AI, Sunnyvale, CA, US

Research Engineer

Aug. 2019 - Present

- Automated machine learning (AutoML) for time-series forecasting.

DiDi Chuxing AI Labs, Beijing, China

Research Intern

Dec. 2017 - Feb. 2018, May 2018 - Aug. 2018

- Proposed a multi-task representation learning framework for origin-destination travel time estimation. Experimental results on two large-scale real-world datasets showed that the proposed approach clearly outperformed state-of-the-art methods. These works were published on the International Conference on Knowledge Discovery and Data Mining (KDD) 2018, and the AAAI Conference on Artificial Intelligence (AAAI) 2019.

Facebook Inc., Menlo Park, CA, US

Software Engineer Intern

May 2017 - Aug. 2017

- Proposed a unified machine learning model for both place visit segmentation and classification based on Hidden Markov Model and Gradient Boosted Decision Tree. Comparing to the method used in production, the proposed model improved the precision by more than 10% at the same recall. The proposed model has been deployed in the production.

Google Inc., New York, NY, US

Software Engineer Intern

May 2016 - Aug. 2016

- Proposed a model to generate high-quality business information (that will be displayed on Google Maps) from various low-quality data sources, e.g., street view image, untrusted third-party websites. The proposed model had generated tens of thousands of high-quality business information.
- Proposed a deep learning model to predict whether a website is the authority website of a small business. This work was presented at a Google-wide machine learning workshop.

Google Inc., Montreal, Quebec, Canada

Research Intern

May 2015 - Aug. 2015

- Proposed a video summarization algorithm to select interesting frames based on audio, visual and motion information. Results on more than 500 minutes youtube videos showed that the algorithm consistently outperforms baseline methods, e.g., k-means and uniform sampling based ones, in terms of attractiveness and informativeness.
- Proposed an approach to generate summary video for preview in poor Internet conditions. The resulted videos have bitrate at about 40kbit/s while preserving reasonable good image quality.

Chinese Academy of Sciences, Beijing, China

Research Assistant

Aug. 2012 - Jul. 2014

- Contributed to many projects funded by National Natural Science Foundation of China (NSFC) on spatial-temporal data management.
- Proposed traffic analysis model based on network matched GPS trajectories that achieved higher accuracy with less storage and communication cost. The result was published in a top-tier journal (IEEE Transactions on Intelligent Transportation Systems).

TEACHING

Machine Learning for Time Series Analysis - Statistical Models and Deep Learning
Summer 2018 in Peking University with Prof. Yan Liu

Geospatial Information Management (CSCI 587)

Fall 2015, Fall 2016

Teaching assistant: Advised 35 course projects; delivered several lectures; designed exams and organized weekly Q/A discussion.

ACADEMIC SERVICE **Web Chair**, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2020

Co-organizer, 6th SIGKDD Workshop on Mining and Learning from Time Series (MiLeTS), 2020

Co-organizer, 5th SIGKDD Workshop on Mining and Learning from Time Series (MiLeTS), 2019

Co-organizer, 4th SIGKDD Workshop on Mining and Learning from Time Series (MiLeTS), 2018

Web Chair, International Conference on Web Search and Data Mining (WSDM), 2018

Reviewer, IEEE Transactions on Knowledge and Data Engineering (TKDE), 2019, 2020

Reviewer, International Conference on Machine Learning (ICML), 2019, 2020

Reviewer, Transportation Research Part C (TRC), 2019

Reviewer, IEEE Transactions on Intelligent Transportation Systems (TITS), 2015 - 2020

Reviewer, IEEE Transactions on Intelligent Systems and Technology (TIST), 2019, 2020

Reviewer, GeoInformatica, 2019

Reviewer, Journal of Computer Science and Technology (JCST), 2019

External Reviewer, International Joint Conference on Artificial Intelligence (IJCAI), 2018

External Reviewer, International Conference on Learning Representations (ICLR), 2018

External Reviewer, International Conference on Very Large Databases (VLDB), 2016, 2017

External Reviewer, International Conference on Distributed Computing Systems (ICDCS), 2016

External Reviewer, ACM International Conference on Management of Data (SIGMOD), 2015

SELECTED AWARDS AND HONORS **Annenberg Graduate Fellowship**, University of Southern California, 2014-2018

Best Research Assistant, University of Southern California, 2018

KDD Student Travel Award, 2018

ICLR Travel Award, 2018

NIPS TSW Travel Award, 2017

Outstanding Graduate, University of Chinese Academy of Sciences, 2014

Pivot of Merit Student, University of Chinese Academy of Sciences, 2014

National Scholarship, China, 2011, 2014

Third Place in ACM SIGSPATIAL GIS CUP, 2012

Outstanding University Graduate, Beijing, China, 2011