YUE YU

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"THROWING IN DATA, BUT THIRSTY FOR KNOWLEDGE"

EDUCATION

Tsinghua University *Beijing, China*
B.Eng. in Electronic Engineering Aug 2015 – June 2019 (Expected)
B.Ec. in Economic and Management (Second Degree)

- **GPA:** 3.81/4.00 (93/100), **Rank:** 3/212 (1.5%, in Department), 1/31 (in Class).
- **Math and Physics Courses:** Calculus (I: A, II: A-), Linear Algebra (I: A, II: A), Physics (I:A, II: A+), Probability and Stochastic Processes (I: A-, II: A), Discrete Mathematics (A), Functions of Complex Variables and Equations of Mathematical Physics (A), Econometrics (A), Quantum Mechanics and Statistical Mechanics (A).
- **Core Courses:** Computer Program Design (I: A-, II: A-), Data Structure and Algorithm, Introduction to Auditory-visual Information System (A), Database (A), Signals and Systems (A-), Advanced MATLAB Programming (A-), Student Research Training (A+), Mobile Data Mining (Graduate course, A).

University of Illinois at Urbana Champaign *Urbana, IL, USA*
Visiting Student at Department of Computer Science Jul 2018 – Sep 2018

- Visiting student and Research Assistant in Artificial Intelligence Lab at UIUC.

RESEARCH INTERESTS

Big data mining: Mining the information for semantics-rich data (e.g. Spatio-temporal data, Time-Series data, Text data) with machine learning methods.
Mining large social and information networks: Developing novel methods to capture the rich semantics in information networks with multi-type objects with application to real-world problems.
Data-Driven Urban Computing: Analyzing the urban mobility data to address critical urban issues. I am also enthusiastic about interdisciplinary research.

PUBLICATIONS

1. **Y. Yu,** T. Xia, Y. Li. B&B: Planning Bus Routes with Sharing-bikes in the city. Submitted to *SIAM International Conference on Data Mining* (SDM'19). Under Review.
2. X. Xu*, **Y. Yu***, B. Li, L. Song, C. Liu, C. Gunter. Characterizing Malicious Edges targeting on Graph Neural Networks. Submitted to *International Conference on Learning Representations* (ICLR'19). Under Review.
3. T. Xia*, **Y. Yu***, F. Xu, Y. Li. Understanding Urban Dynamics via State-sharing Hidden Markov Model. Submitted to *The Web Conference* (WWW'19). Under Review.
4. M. Zhang, **Y. Yu,** Y. Li. A Survey on Urban Anomaly: Description, Detection and Prediction. Submitted to *ACM Transactions on Intelligent Systems and Technology* (ACM TIST). Under Review.
5. C. Gao, C. Huang, **Y. Yu**, Y. Li. Privacy-preserving Cross-domain Location Recommendation. Conditionally accepted by *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* (IMWUT'19).

Note: * stands for equal contribution.

RESEARCH EXPERIENCE

City Brain Research Center *Hangzhou, China*
Research Intern to Prof. Zhenhui Li, Associate Professor at College of Information Sciences and Technology of *Pennsylvania State University* Sep 2018 – Present
Deep Reinforcement Intelligent for Intelligent Traffic Light Control

- Use real traffic flow data in Hangzhou to design self-learning traffic signal control system.
- Draw connection between the RL method and the traditional transportation theory to achieve better performances on flow control in urban grid network scenarios.
- **Key Words**: Reinforcement Learning, Urban Computing, Transportation theory.

Tsinghua University (Department of Electronic Engineering) *Beijing, China*
Research Assistant to Prof. Yong Li, Future Communications & Internet Lab Sep 2018 – Present
Cross-domain Social Recommendation

- Propose novel method with graph neural networks for cross-domain recommendation.
- Use deep learning models for learning embedding for items. For social interactions, we use GNN to model the social influence. Then, we combine them together to achieve better accuracy in recommendation.
- **Key Words:** Social Recommendation, Matrix Factorization, Graph Neural Networks.

University of Illinois at Urbana-Champaign *Urbana, IL, USA*
Research Assistant to Prof. Bo Li, Artificial Intelligence Lab Jul 2018 – Sep 2018
Malicious Edge Detection on Graph-Structured Data

- Designed a novel graph generation method together with link prediction method to detect malicious edges. We also leveraged novel features to perform outlier detection for detection.
- Extensive experiments showed that the proposed detection mechanism can achieve AUC above 90% against attack strategies on both Cora and Citeseer datasets.
- **Key Words**: Adversarial Machine Learning, Graph Mining, Graph Neural Networks.

Tsinghua University (Department of Electronic Engineering) *Beijing, China*
Research Assistant to Prof. Yong Li, Future Communications & Internet Lab Jun 2018 – Oct 2018
Understanding Urban Dynamics via State-sharing Hidden Markov Models

- Collected human PoI check-in data and citizens' mobility flow data to describe urban's regularity.
- A novel urban dynamic revealing system based on the state sharing HMM models is used to identify the typical dynamic patterns on various regions of the city with different urban functions.
- Supported by ***Tsinghua University Initiative Scientific Research Program*** with funding of 5000 USD.
- **Key Words:** Urban Computing, Spatial-Temporal Data Mining, Hidden Markov Models.

Tsinghua University (Department of Electronic Engineering) *Beijing, China*
Research Assistant to Prof. Yong Li, Future Communications & Internet Lab May 2018 – Aug 2018
Privacy-preserving Cross-domain Location Recommendation

- Presented a new framework for privacy-preserving cross-domain location recommendation, in which data from the auxiliary domain is protected with the criteria of differential privacy.
- Designed confidence-enhanced collective matrix factorization (CCMF) to effectively exploit the transferred interaction data and improved the recommendation performance by 2.05%-111.76%.
- **Key Words**: Collaborative Filtering, Location Recommendation, Data Privacy.

Tsinghua University (Department of Electronic Engineering) *Beijing, China*
Research Assistant to Prof. Yong Li, Future Communications & Internet Lab Dec 2017 – May 2018
Mobile Trajectory Data Mining and its application to Bus Route Planning

- Detected hot spots for urban traffic and derived candidate bus stations via mining massive trajectories.
- Designed a heuristic approach to expand each bus routes to consider the sharing-bikes simultaneously. Our method outperforms 7.05% and 15.55% over the methods without considering sharing-bikes.
- **Key Words**: Bus route design, Sharing-bikes, Urban Planning.

Tsinghua University (Department of Electronic Engineering) *Beijing, China*
Instructed by Prof. Jiansheng Chen, Associate Professor at Tsinghua University Oct 2017 – Dec 2017
Cross Modal Matching of the Video and Audio Information

- Given disordered video and audio sequence, using the existing deep learning framework (Inception V3 for video and VGG for audio) to extract visual and auditory features.
- Used the Bi-directional LSTM with the attention mechanism to measure the similarity between audio-visual information to retrieve the original audio files corresponding to each silent video.
- **Key Words**: Deep Learning, Cross-Modal learning, Computer Vision.

SELECTED AWARDS AND HONORS

- **China National Scholarship**, 2018 (*Highest level* of scholarship set by the government of China)
- **Hoka Scholarship**, 2017 (Awarded to students with outstanding comprehensive performance)
- **Changhong Scholarship**, 2016 (Awarded to students with outstanding comprehensive performance)
- **Tsinghua Comprehensive Excellence Award**, 2016-2018 (Top 5% student in EE department)
- **Tsinghua Academic Excellence Award**, 2016-2018 (Top 5% student in EE department)
- **Tsinghua Research Excellence Award**, 2018 (Top 5% student in EE department)
- **Tsinghua Volunteering Excellence Award**, 2016 (Top 5% student in EE department)
- **1st Prize** for the 32rd National Undergraduate Physics Olympic, 2016 (Top 1%)

ADDITIONAL INFORMATION

- **Computer skills:** C/C++, Python, MATLAB, SQL, STATA, Verilog, Pytorch, Keras, Spark, Latex.
- **Language:** Mandarin Chinese (Native); English (Proficient: TOEFL 103/120; GRE V156, Q170, AW 4.0).
- **Extracurricular activities:** Siyuan Leadership Training Programme (Top 1% out of 3300 students in Tsinghua University), Yangfan Excellent Student Training Program (Top 10% out of 260 students in EE Dept.), Student Union of EE Dept. (2016), Student Union of Tsinghua University (2015, 2017).