ZUN LI

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EDUCATION

Shanghai Jiao Tong University *Sept. 2014 - June 2018 (expected)*
B.S.E. in Computer Science (IEEE Honored Class)
Overall GPA: 3.71/4.00 (88.55/100) Major GPA: 3.81/4.00 (90.04/100)
Core Courses: Mathematical Analysis I & II (93 & 91/100), Linear Algebra (97/100), Probability Theory and Random Process (92/100), Automata Theory (95/100), Software Engineering (92/100, Rank **1st**/60), Artificial Intelligence (90/100), Algorithm Design and Analysis (98/100, Rank **1st**/60)

Cornell University *June - July 2017*
Visiting Student, SJTU International Workshop Program

INTERESTED AREAS

EconCS, including Algorithmic Game Theory, Network Economics, with their applications such as Data Exchange, Computational Advertising, and Recommender System

PUBLICATIONS

[1] **Zun Li**, Zhenzhe Zheng, Fan Wu, Guihai Chen, "How to Buy Cookies? On Designing Optimal Data Purchasing Strategies for Online Ad Auctions", **submitted** to *AAMAS, 2018*

[2] Zhenzhe Zheng, **Zun Li**, Fan Wu, Shaojie Tang, Guihai Chen, "How to Sell Data? On Designing Optimal Data Trading Strategy for Data Marketplace", **submitted** to *WWW, 2018*

[3] **Zun Li**, Hongjiang Lv, Zhenzhe Zheng, Fan Wu, Guihai Chen, "Learning in Online Marketplace: Data Purchasing Policy Designs under Uncertainty", being revised for *IJCAI-ECAI, 2018*

[4] Zhenzhe Zheng, **Zun Li**, Fan Wu, Guihai Chen, "Generalized Online Auctions with Time Varying Values", In preparation for *IJCAI-ECAI, 2018*

RESEARCH EXPERIENCE

A Top-K Ranking Based Collaborative Filtering Algorithm *June 2017 - Present*
Research Intern at Qing Zhao Group, Cornell University *Advisor: Prof. Qing Zhao*

- Investigated machine learning techniques such as Learning-to-Rank and low-rank matrix factorization
- Designed a new metric to measure the accuracy of Top-K items ranking and developed a new way to find similar neighbors for each user based on the new metric
- Proposed a new CF algorithm where each observed rating was assigned a score, based on which the rank aggregation among neighbors was conducted
- Implemented the designed algorithm and obtained 10% gain against state-of-art ones on real datasets
- Providing theoretical bound for the designed algorithm

Mechanism Design for Data Exchange *Aug. 2016 - Sept. 2017*
Researcher Assistant at Advanced Network Lab, SJTU *Advisor: Prof. Fan Wu*

My research on Data Exchange is threefold, consisting of:

i. **Computational Advertising and Data Engineering**

- Proposed a general framework consisting of a data purchasing model and an ad auction model, and formulated advertisers' trade-offs as a convex optimization problem by using Payoff Equivalence Principle
- Proved the existence and uniqueness of the equilibrium under a general scheme, and showed how to calculate the optimal data purchasing strategy for Gaussian Learning agents with linear cost
- Conducted numerical simulations to evaluate the behaviors of two types of learning agents under different strategic environments, whose results confirmed intuitions

ii. **Economic Techniques for Cloud-based Data Market Pricing**

- Proposed a market model where vendors are allowed to price data by deploying economic techniques such as demonstration, free sampling, and versioning (flexible) strategies
- Derived optimal trading strategies for various cases, showed under which condition would these strategies become profitable, and why flexible strategy brings little economic incentive, confirming reality
- Verified the designed strategies on a real-world taxi location dataset

iii. **Learning Agents in Data Market**

- Segmented into three levels of uncertainty for data consumers, who were assumed to adopt Gaussian Learning to learn the quality distributions
- Proposed interpolation based reinforcement learning algorithms to compute the policies efficiently
- Achieved near-optimal approximation ratio on generated data

Online Mechanism Design with Time Varying Values *Oct. 2017 - Present*
Researcher Assistant at Advanced Network Lab, SJTU *Advisor: Prof. Fan Wu*

- Considered an online auction model for selling reusable goods where agents' values are assumed to be vary with time, and preemption that reallocate goods to newly arrived agents is allowed
- Proposed a dynamic programming based allocation algorithm and proved that the upper bound of competitive ratio with the off-line optimal solution is within constant factors
- Determined the unique payment by extending classical Myerson's Lemma for the proposed generalized model and designed a strategy-proof online mechanism for agents with time varying values

SELECTED PROJECTS

XPO: An Online Campus Second-hand Trading Market System *Mar. 2016 - June 2016*

- Conducted all the business process for a software engineering project, including the documents completion and software production
- Developed an Android campus second-hand trading platform APP, and implemented pattern design into the system framework design

MIDI Music Files Synchronization via SeqGAN *Mar. 2017 - June 2017*

- Investigated MIDI formats and used specialized module to extract features from raw MIDI files
- Researched and implemented Sequential Generative Adversarial Network (SeqGAN) by TensorFlow to train music data set and generate new MIDI files

A Hierarchical Network Selection Game for HetNets *Mar. 2017 - June 2017*

- Proposed a generalized game framework for heterogeneous networks selection, including a cooperative game within a population and a non-cooperative game between different populations
- Compared the algorithmic performances of the normal selection, reinforcement learning selection and evolutionary selection toward equilibrium state

PROFESSIONAL ACTIVITIES

External Reviewer for IEEE TWC, TCOM, IWQoS 2017, INFOCOM 2018

HONOR & REWARDS

Meritorious Winner (Top **15%** Worldwide), Interdisciplinary Contest in Modeling *2016*
First Class Prize (Top **2%** Provincial Level), National Undergraduate Physics Contest *2015*
Eleme Corporation Scholarship (Top **10%**) *2016-2017*
Litiantangren Corporation Scholarship (Top **10%**) *2015-2016*
SJTU Academic Excellence Scholarship Class-B (Top **10%**) *2016-2017, 2015-2016*
SJTU Academic Excellence Scholarship Class-C (Top **20%**) *2014-2015*
Champion (**1st**/1000 Contestants), "Step-by-Step" Campus Orienteering & Quiz Game *2015*

TECHNICAL SKILLS

Programming Languages Python, C++, Java, PHP, HTML/CSS, SQL, Verilog
Tools MATLAB, Mathematica, TensorFlow, Git, LaTeX, Gnuplot, XAMPP