

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 economic techniques such as deploy 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

Researcher Assistant at Advanced Network Lab, SJTU

*Oct. 2017 - Present
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	<i>2016</i>
First Class Prize (Top 2% Provincial Level), National Undergraduate Physics Contest	<i>2015</i>
Rajax Corporation Scholarship (Top 10%)	<i>2016-2017</i>
Litiantangren Corporation Scholarship (Top 10%)	<i>2015-2016</i>
SJTU Academic Excellence Scholarship Class-B (Top 10%)	<i>2016-2017, 2015-2016</i>
SJTU Academic Excellence Scholarship Class-C (Top 20%)	<i>2014-2015</i>
Champion (1st /1000 Contestants), "Step-by-Step" Campus Orienteering & Quiz Game	<i>2015</i>

TECHNICAL SKILLS

Programming Languages Tools

Python, C++, Java, PHP, HTML/CSS, SQL, Verilog
MATLAB, Mathematica, TensorFlow, Git, L^AT_EX, Gnuplot, XAMPP