ZUN LI

◇ Mobile: +86-139-1625-6613 ◇ Email: rezunli96@gmail.com
◇ Homepage: https://rezunli96.github.io/ ◇ Github: https://www.github.com/rezunli96/

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

INTERESTED AREAS

EconCS, including Algorithmic Game Theory, Network Economics and Machine Learning, 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] **Zun Li**, Hongjiang Lv, Zhenzhe Zheng, Fan Wu, Guihai Chen, "Learning in Online Marketplace: Data Purchasing Policy Designs under Uncertainty", **submitted** to *AAMAS, 2018*

[3] 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*

[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, therefore 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 an ad auction model and a data purchasing model, thus formulate 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 show 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 to intuitions.

ii. **Learning Agents in Data Market.**

- Divided 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.
- The algorithms achieved near-optimal approximation ratio on generated data.

iii. **Economic Techniques for Cloud-based Data Market Design.**

- Proposed a theoretical market model where vendors are allowed to price data by economic techniques like demo making, free sampling and versioning (flexible) strategies.
- Derived optimal trading strategies for various cases, and showed under which cases would these strategies become profitable and why flexible strategy brings no economic incentive, confirming reality.
- Evaluated the strategy designs on a real-life taxi location dataset verifying theoretical analysis.

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. Preemption that reallocating goods to newly arrived agents is allowed.
- Proposed a dynamic programming-based allocation algorithm. 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 thus 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. Implemented pattern design into the system framework design.

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

- Investigated MIDI formats. 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, 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*
Rajax 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.