Peiyao Sheng

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simplespy.github.io

Education

Sept 2021 – Present **Ph.D., Computer Science.**
University of Illinois, Urbana-Champaign

Sept 2019 – Present **M.S., Computer Science.**
University of Illinois, Urbana-Champaign

Sept 2015 – June 2019 **B.S., Computer Science and Technology.**
ACM Honors Class (an elite CS program for top 5% talented students)
Zhiyuan College, Shanghai Jiao Tong University, China

Publications

CCS 2021 **Peiyao Sheng**, Gerui Wang, Kartik Nayak, Sreeram Kannan, Pramod Viswanath. *"BFT Protocol Forensics"*.

FC 2021 **Peiyao Sheng**, Bowen Xue, Sreeram Kannan, Pramod Viswanath. *"ACeD: Scalable Data Availability Oracle"*. Financial Cryptography and Data Security.

ASRU 2019 **Peiyao Sheng**, Zhuolin Yang, Yanmin Qian. *"GANs for Children: a Generative Data Augmentation Strategy for Children Speech Recognition"*. IEEE Automatic Speech Recognition and Understanding Workshop.

ISCSLP 2018 **Peiyao Sheng**, Zhuolin Yang, Huhu, Tian Tan, Yanmin Qian. *"Data Augmentation using Conditional Generative Adversarial Networks for Robust Speech Recognition"*. International Symposium on Chinese Spoken Language Processing.

Research Experience

Jan 2020 – Present **Coordinated Science Lab**, at University of Illinois at Urbana-Champaign.
Research Assistant, advised by *Prof. Pramod Viswanath*

Worked on a scalable data availability oracle for blockchains. [Paper]

- Proposed ACeD, integrated coding-theoretic designs inside of Merkle tree commitments to guarantee efficient and tamper-proof reconstruction. Achieved constant communication efficiency and storage overhead.
- Implemented ACeD in 6000 lines of Rust code, integrated the functionality as a smart contract into Ethereum demonstrating up to 10,000 tps in throughput and 6000x reduction in gas cost on the testnet Kovan. [Code]

Worked on forensic support for BFT protocols. [Paper]

- Formalized the forensic support to provide irrefutable evidence when bad behaviors happen in BFT protocols. Proved that well-known protocols like PBFT, Hot-Stuff, and VABA have strong forensic support. Proved an impossibility result for protocols which can tolerate half corruptions (e.g. in a synchronous network).
- This work has been submitted as a Diem Improvement Proposal (DIP) to Diem (Libra) blockchain. [Proposal]

Sept 2018 – Dec 2018 **Security Lab**, at University of Illinois at Urbana-Champaign.
Visiting Research Intern, advised by *Prof. Bo Li*

Worked on a privacy-preserving advertisement recommendation contract system.

- Implemented a recommendation contract based on Factorization Machine (FM) using Ethereum API web3. Achieved privacy-preserving by decrypting data only inside the secure enclave. Evaluated the performance on Intel SGX, latency statistics are small with heavy workload, also increase super-linearly with the throughput.

Sep 2017 – Mar 2018 **SpeechLab**, at Shanghai Jiao Tong University.
Undergraduate Researcher, advised by *Prof. Kai Yu* and *Prof. Yanmin Qian*

- Explored conditional Generative Adversarial Network (cGAN) for data augmentation to improve Automatic Speech Recognition (ASR) in noisy environments. Obtained a relative 6% to 10% Word Error Rate (WER) reduction upon an advanced acoustic model.

Professional Experience

Industry Experience.

Spring 2019 Research Intern, Urban Computing Group, SenseTime, China

Teaching Assistant.

Fall 2019 CS107, Data Science Discovery
Spring 2018 MS208, Compilers
Summer 2017 MS106, Principle and Practice of Computer Algorithms
Spring 2017 MS105, Data Structures
Fall 2017 CS122, C++ Programming

Honors and Awards

2020 **ACM-ICPC Mid-Central USA Regional Contest** *2nd place*
Team *UIUC D*, Zhuolin Yang, Peiyao Sheng, Hanxuan Chen

2019 **Outstanding Graduates**
Excellent graduates in Shanghai Jiao Tong University

2016-2017 **Kai Yuan Scholarship** *Top 2%*
Excellent scholarship in Zhiyuan College

2017 **Meritorious Winner** *Top 10%*
First Prize in Interdisciplinary Contest In Modeling, 2017

2015, 2016 **Academic Excellence Scholarship** *1st place*
Top 5% students award in Shanghai Jiao Tong University

2016,2017 **Zhiyuan Honorary Scholarship.**