# Lequn Chen

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## Education

**University of Washington** — **Seattle**
*Ph.D. Student, Computer Science* — *Sept 2018–Present*
Advisor: Prof. Arvind Krishnamurthy

**ACM Honors Class, Shanghai Jiao Tong University** — **Shanghai**
*Bachelor, Computer Science* — *Sept 2014–June 2018*
Advisors: Prof. Weinan Zhang, Prof. Gui-Rong Xue, and Prof. Yong Yu

## Research Interests

- Distributed Systems
- Machien Learning Systems
- Operating Systems

## Publications

1. **Nexus: A GPU Cluster Engine for Accelerating Neural Networks Based Video Analysis**
   - Haichen Shen, **Lequn Chen**, Yuchen Jin, Liangyu Zhao, Bingyu Kong, Matthai Philipose, Arvind Krishnamurthy, Ravi Sundaram
   - Proceedings of the 27th Symposium on Operating Systems Principles (SOSP'19)
2. **ADARES: Adaptive Resource Management for Virtual Machines**
   - Ignacio Cano, **Lequn Chen**, Pedro Fonseca, Tianqi Chen, Chern Cheah, Karan Gupta, Ramesh Chandra, Arvind Krishnamurthy
   - arXiv, abs/1812.01837, 2018
3. **Enabling Strong Database Integrity using Trusted Execution Environments**
   - Kai Mast, **Lequn Chen**, Emin Gün Sirer
   - arXiv, abs/1801.01618, 2018
4. **Scaling Databases through Trusted Hardware Proxies**
   - Kai Mast, **Lequn Chen**, Emin Gün Sirer
   - Proceedings of the 2nd Workshop on System Software for Trusted Execution (SysTEX'17)

## Industry Experience

**Google** — **Kirkland, WA**
*Software Engineering Intern, **Tango** Team* — *June 2019–Sept 2019*

- Added a new feature to the Memcache service: replication.
  - Reasoned about consistency guarantees of the new feature.
  - Implemented with 10k lines of C++ code.
  - Covered by unit tests and integration tests.
- In-depth discussion of the *Virtual Object Set* feature of the next-generation Tango.

## Course Works

**CSE552 Parallel and Distributed Systems**: Grade 4.0/4.0 — *Spring 2019*
**CSE505 Computer Security and Privacy**: Grade 3.9/4.0 — *Winter 2019*
**CSE505 Principles of Programming Languages**: Grade 4.0/4.0 — *Autumn 2018*
**CSE550 Introduction to Computer Systems Research**: Grade 4.0/4.0 — *Autumn 2018*

## Prior Research Experiences

**Systems Lab** — **Cornell University**
*Visiting Research Intern, advised by **Prof. Emin Gün Sirer** and **Kai Mast*** — *July 2017–Dec 2017*

- Worked on a database that provides blockchain-like guarantees of data integrity using *Trusted Execution Environments*.
  - Implemented large parts of the prototype on Intel SGX.
  - Boosted the performance inside the SGX enclave.
  - Increased the throughput of multi-client read workload 30x and reduced the latency by 40%.
  - Implemented transaction support with optimistic concurrency control.
  - Optimized query optimizer and executor, reducing cost of join operation to almost constant in typical workloads.
  - Found and solved dozens of deadlocks and data races in the initial version of the code.
  - Designed benchmarks and conducted experiments on a distributed testbed.

**APEX Data & Knowledge Management Lab** — **Shanghai Jiao Tong University**
*Undergraduate Researcher, advised by **Prof. Weinan Zhang*** — *Mar 2017–June 2017*

- Worked on Computational Advertisement. Built a machine learning pipeline for an advertisement exchange startup.
  - Designed and trained a *Click-Through Rate* (CTR) estimation model.
  - Integrate the model with the startup's *Real-Time Bidding* (RTB) software stack.

**Tianrang Network Technology Co.,Ltd** — **Shanghai**
*Research Intern, advised by **Prof. Gui-Rong Xue*** — *June 2016–Mar 2017*

- Worked on a program Yi playing board game Go similar to Google DeepMind's *AlphaGo*. Yi runs Monte-Carlo tree search algorithm, deep neural network, and reinforcement learning algorithms.
  - Designed and Implemented a distributed system running both CPU and GPU workers on multiple machines.
  - Reduced the network latency and increased single-machine performance.
  - Refactored the code base. Trained and tuned neural networks. It could beat entry-level professional human players.

## Teaching Experiences

**Compilers** — *Spring 2017*
*Student Instructor* — https://acm.sjtu.edu.cn/compiler2017

- Led the teaching assistant team.
- Redesigned assignments. Changed the target platform from *SPIM MIPS Simulator* to *Linux x86-64*, giving students more possibilities to do compilation optimization.
- Built a *Continuous Integration* (CI) system abcdabcd987/acm-compiler-judge. Once students pushed changes to their git repository, the CI would fetch the source code, compile it, test its performance on all test cases, and update the leaderboard.

**Principle and Practice of Computer Algorithms** — *Summer 2016*
*Student Instructor* — https://acm.sjtu.edu.cn/wiki/PPCA_2016

- Built an online judge system for algorithm exams.
- Led a group of students to implement simplified MapReduce and Google File System. Deployed and benchmarked them on all machines of the computer room.

**C++ Programming**: Teaching Assistant — *Fall 2015*

## Highlighted Projects

**Compiler 2016** abcdabcd987/compiler2016 — *May 2016*

- Compiles C-and-Java-like language to MIPS assembly. I paid close attention to code generation and optimization. Features included graph coloring register allocation, transformation in *Static Single Assignment* form, and different kinds of optimizations.

## Programming Skill Set

I am experienced with C++, Python, Rust, systems programming, asynchronous networking programming, concurrent computation (multi-threading / distributed systems), and solving difficult bugs.