Cai, Yifan

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EDUCATION

University of Pennsylvania — PA, US
Ph.D. student in Computer and Information Science — Sep 2020 - present

Shanghai Jiao Tong University — Shanghai, China
Bachelor of Engineering, Software Engineering — June 2020
  Overall GPA: 3.77 / 4.30 (88.19/100); **Major GPA:** 3.88 / 4.30 (89.95/100)
  Honors/Awards:
  - SJTU Scholarships (2016-2017, 2017-2018 & 2018-2019)

PUBLICATIONS

VeriDB: An SGX-based Verifiable Database
  Wenchao Zhou, **Yifan Cai**, Yanqing Peng, Sheng Wang, Ke Ma, and Feifei Li.
  To appear at *ACM SIGMOD International Conference on Management of Data, SIGMOD 2021.*

Understanding the Effect of Data Center Resource Disaggregation on Production DBMSs. [PDF]
  Qizhen Zhang, **Yifan Cai**, Xinyi Chen, Sebastian Angel, Ang Chen, Vincent Liu, and Boon Thau Loo.
  In *46th International Conference on Very Large Data Bases (VLDB), 2020.*

Intra-day Forecast of Ground Horizontal Irradiance Using Long Short-Term Memory Network (LSTM). [PDF]
  Xiuhong Chen, Xianglei Huang, **Yifan Cai**, Haomin Shen, Jiayue Lu.
  In *Journal of the Meteorological Society of Japan*, 2020.

Rethinking Data Management Systems for Disaggregated Data Centers. [PDF]
  Qizhen Zhang, **Yifan Cai**, Sebastian Angel, Ang Chen, Vincent Liu, and Boon Thau Loo.
  In *Conference on Innovative Data Systems Research (CIDR)*, 2020.

Consensus-based Data Statistics in Distributed Network Systems. [PDF]
  Yifan Cai, Jianping He, Wenbin Yu, and Xinping Guan.
  In the *57th IEEE Conference on Decision and Control, Miami, USA,* December 2018.

EXPERIENCE

DAMO Academy, Alibaba Cloud Intelligence, Alibaba Group — Hangzhou, China
Research Intern, Advisor: Dr. Wenchao Zhou and Dr. Sheng Wang — Jul 2020 – Apr 2021
- Conducted research on a verifiable database system that runs on an untrusted cloud service provider.
- Implemented trusted operators and trusted data structures to the sgx-based database prototype.
- Designed and implemented methods such as seprating the read/write sets to improve the performance significantly.
- Designed and implemented new methods to guarantee both durability and verifiability of data.

University of Pennsylvania — PA, US
Research Intern, Advisor: Dr. Vincent Liu — Jul 2019 – Dec 2019
- Conducted research on the impact of disaggregated data centers on the design of relational databases
- Developed microbenchmarks of nested loop join, hash join, and grace hash join operators and investigated the relationship between local memory size, the number of remote memory access and the performance degradation of each operation
- Added features such as relative paths to LegoOS (a disaggregated operating system) by adding more

system calls in order to deploy complex systems such as PostgreSQL and MonetDB on it.

- Analyzed the performance drawbacks of existing disaggregated operating systems for query executions, and outlined potential solutions
- Categorized database queries by the operators used and analyzed to which degree resource disaggregation would lead to the performance degradation of each operator

Lab of System Control and Information Processing, SJTU   Shanghai, China
Research Assistant, Advisor: Dr. Jianping He   Sep 2017 – Jun 2019

- Invented a protocol in distributed network systems to compute probability density functions in a fully distributed way and enable multiple compute nodes to share their statistics
- Designed and optimized two probability distribution functions (PDF) to calculate algorithms which run under both public and anonymous network conditions

University of Michigan   MI, US
Research Intern, Advisor: Dr. Xianglei Huang   Aug 2018 – Sep 2018

- Built an LSTM-based solar forecasting system
- Designed and implemented the prediction model with an approximate error of only 10%.

SKILLS

Programming Languages: C/C++, Python, Java, JavaScript, SQL
Languages: Mandarin (Native), English (TOFEL 111)