Marc Chengliang Zhang

PRESENT POSITION

Ph.D Candidate
Dept. of Computer Science & Engineering
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RESEARCH INTERESTS

My interests cover **big data analytics systems** and **cloud computing**, with a special focus on **machine learning systems**. I enjoy identifying fundamental system design and performance issues in large-scale ML systems for both training and inference, and searching for general and efficient solutions.

EDUCATION

Hong Kong University of Science and Technology, Hong Kong SAR
Department of Computer Science and Engineering

⋄ **Ph.D.** Computer Science and Engineering   September 2016 - present
　⋄ *Supervisor:* Wei Wang
　⋄ Hong Kong PhD Fellowship recipient: prestigious and highly selective

Harbin Institute of Technology, Harbin, China
School of Computer Science and Technology

⋄ **B.Eng.** Software Engineering   September 2012 - June 2016
　⋄ *Honors:* National Scholarship (Top 2%), People's Scholarship, Fuji Xerox Scholarship

PUBLICATIONS

Chengliang Zhang, Suyi Li, Junzhe Xia, Wei Wang, Feng Yan, Yang Liu "BatchCrypt: Efficient Homomorphic Encryption for Cross-Silo Federated Learning," in the *Proceedings of USENIX Annual Technical Conference (ATC'20)*, Boston, MA, July 2020 (top venue acc. CSRankings).

Jun Yi, Chengliang Zhang, Wei Wang, Cheng Li, Feng Yan, "Not All Explorations Are Equal: Harnessing Heterogeneous Profiling Cost for Efficient MLaaS Training," in the *Proceedings of IEEE International Parallel and Distributed Processing Symposium (IPDPS'20)*, New Orleans, LA, May 2020.

Chengliang Zhang, Minchen Yu, Wei Wang, Feng Yan, "MArk: Exploiting Cloud Services for Cost-Effective, SLO-Aware Machine Learning Inference Serving," in the *Proceedings of USENIX Annual Technical Conference (ATC'19)*, Renton, WA, July 2019 (top venue acc. CSRankings).

Chengliang Zhang, Huangshi Tian, Wei Wang, Feng Yan, "Stay Fresh: Speculative Synchronization for Fast Distributed Machine Learning," in the *Proceedings of IEEE International Conference on Distributed Computing Systems (ICDCS'18)*, Vienna, Austria.

Chengliang Zhang, Minchen Yu, Wei Wang, Feng Yan, "Enabling Cost-Effective,

SLO-Aware Machine Learning Inference Serving on Public Cloud," in the *IEEE Transactions on Cloud Computing*.

Yinghao Yu, <u>Chengliang Zhang</u>, Wei Wang, Jun Zhang, Khaled Letaief, "Towards Dependency-Aware Cache Management for Data Analytics Applications," in the *IEEE Transactions on Cloud Computing*.

RESEARCH EXPERIENCE

Research Scientist Intern @ Bell Labs Germany
- Serverless Computing
- Federated Learning

Fast Secure Federated Learning System
- Inter-enterprise federated learning with Homomorphic Encryption
- Accelerate training and inference of Secure Federated Learning
- Mitigate encryption and communication overhead

MArk: ML Serving on Public Cloud
- Serve machine learning inference on public cloud, cost-effectively and SLO-aware
- Characterization of ML serving and its performance cloud services and hardware accelerators like GPU and TPU
- Combine FaaS and IaaS to reduce over-provisioning

Speculative Synchronization
- Distributed data parallel training
- Relaxed consistency can increase throughput but hurt update quality
- Re-synchronize if the parameter copy is too stale to produce beneficial updates

SKILLS

◇ Python   ◇ Java, Scala   ◇ C++
◇ Keras   ◇ TensorFlow   ◇ MXNet
◇ Hadoop / Spark   ◇ Mandarin: native   ◇ English: *IELTS 8*

REFERENCES

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