

# Marc Chengliang Zhang

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## 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 system design, performance, and privacy 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%), 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, Chengliang Zhang, 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**

- Confidential Collaborative Machine Learning
- Protect both Data Privacy and Model Privacy
- Trusted Execution Environment

### **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

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|---------------------------------------|--|
| ◇ Python: proficient                  | ◇ Java, Scala, C++: familiar with        |
| ◇ Keras, TensorFlow: proficient       | ◇ Mandarin Chinese: native               |
| ◇ English: proficient, <i>IELTS 8</i> | ◇ Cantonese: limited working proficiency |

## REFERENCES

**Wei Wang**, Assistant Professor  
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