

# 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 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.

[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 (20% acceptance rate).

[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, July 2018 (20% acceptance rate).

[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*.

## Preprints

Chengliang Zhang, Minchen Yu, Wei Wang, Feng Yan, “Enabling Cost-Effective, SLO-Aware Machine Learning Inference Serving on Public Cloud,” submitted to *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-effective and SLO-aware
- Characterization of ML serving and its performance cloud services
- Combine FaaS and IaaS to reduce over-provisioning
- Characterization of hardware accelerators like GPU and TPU

### 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         | ◇ Java, Scala      | ◇ C++                     |
| ◇ Keras          | ◇ TensorFlow       | ◇ MXNet                   |
| ◇ Hadoop / Spark | ◇ Mandarin: native | ◇ English: <i>IELTS 8</i> |

## REFERENCES

**Wei Wang**, Assistant Professor  
Hong Kong University of Science and Technology  
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