

# Marc Chengliang Zhang

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## PRESENT POSITION

Ph.D Candidate  
Dept. of Computer Science & Engineering  
Hong Kong University of Science and Technology  
Clear Water Bay, Hong Kong

Office: Room CYT 3007  
Phone: +852-6216-2287  
Email: [czhangbn@cse.ust.hk](mailto:czhangbn@cse.ust.hk)  
Web: <https://marcoszh.github.io/>

## 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 fellowship

**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

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, "Towards Cost-Effective and SLO-Aware Machine Learning Inference Serving on Public Cloud," to be submitted to *IEEE Transactions on Parallel and Distributed Systems*.

## 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

- |                  |                    |                           |
|------------------|--------------------|---------------------------|
| ◇ 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  
Room 3524, CSE Department, HKUST  
Clear Water Bay, Kowloon, Hong Kong  
*Phone:* +852-2358-6972  
*Email:* [weiwa@cse.ust.hk](mailto:weiwa@cse.ust.hk)  
*Web:* <https://www.cse.ust.hk/~weiwa/>

**Feng Yan**, Assistant Professor  
University of Nevada, Reno  
SEM 233, CSE Department Reno, NV 89557  
*Phone:* +1-775-784-6448  
*Email:* [fyan@unr.edu](mailto:fyan@unr.edu)  
*Web:* <https://wolfweb.unr.edu/~fyan/>