HUANLE XU

CONTACT

Associate Professor
Department of Computer Science
Dongguan University of Technology

Phone: 13144836875
Email: xhlcuhk@gmail.com
Postal Address: University Avenue, Songshan Lake, Dongguan, Guangdong.

EDUCATION

The Chinese University of Hong Kong Aug. 2012 - Aug. 2016

Ph.D. in Information Engineering
Dissertation Advisor: Prof. Wing Cheong Lau,

Shanghai Jiao Tong University Sep. 2008 - Jun. 2012

BSc.(Eng). in Information Engineering
Ranking: Top 8%

RESEARCH EXPERIENCE

The Chinese University of Hong Kong Sep. 2016 - Feb. 2017
Postdoc Fellow in Information Engineering Department *Advisor: Prof. Wing Cheong Lau*

- Design online learning algorithms to mitigate the straggler problem in big data processing clusters.

The University of Texas at Austin Sep. 2015 - Feb. 2016
Visiting Scholar in ECE Department *Advisor: Prof. Gustavo de Veciana*

- Design online resource allocation policies in big data processing clusters, combining redundant execution with opportunistic checkpointing so as to minimize the overall job delays.

RESEARCH INTERESTS

- Design, Implementation, Performance Optimization in Big Data Processing Systems
- Online Learning with Bandit Problems
- Algorithm and Protocol Design in Decentralized Social Networks
- Graph Algorithm Design under Parallel Processing Frameworks
- Distributed Storage Codes Design

RESEARCH FUNDS

- P.I., Online Optimization Based Resource Allocation Scheme Design for Hadoop YARN Systems, NSF of China, 2018.01-2020.12.

RECENT RESEARCH PROJECTS

Online Algorithm Design in the Bandit Setting

- Design online learning algorithms to mitigate machine service variability from a bandit perspective.
- Design Task Assignment policy in deep-learning clusters using linear contextual bandits.

Speculative Execution Mechanism in Big Data Processing Systems

- Design and implement resource allocation modules under MapReduce/ Hadoop YARN.
- Plug in speculative execution schemes to enhance fault tolerance computing and reduce job response time.

Resource Allocation Algorithms for Large-Scale Clusters with Performance Guarantees

- Combine Job scheduling and speculative execution to maximize system utility, which is a combination of job response time and computation cost.
- Design task cloning algorithms with competitive performance bounds to reduce job response time.

PUBLICATIONS

1. **Huanle Xu**, Gustavo de Veciana, Wing Cheong Lau and Kunxiao Zhou, "Online Job Scheduling with Redundancy and Opportunistic Checkpointing: A Speedup-Function-Based Analysis", in IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS), accepted for publication, Sep 2018.
2. **Huanle Xu**, Wing Cheong Lau, Zhibo Yang, Gustavo de Veciana and Hanxu Hou, "Mitigating Service Variability in MapReduce Clusters via Task Cloning: A Competitive Analysis", in IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS), Vol.18, Issue 10, Oct 2017.
3. **Huanle Xu** and Wing Cheong Lau, "Optimization for Speculative Execution in Big Data Processing Clusters", in IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS), Vol.28, Issue 2, Feb 2017.
4. Zhibo Yang, **Huanle Xu***, Jianyuan Deng, Chen Change Loy and Wing Cheong Lau, "Robust and Fast Decoding of High-Capacity Color QR Codes for Mobile Applications", in IEEE Transactions on Image Processing (IEEE TIP), accepted for Publication, July 2018. (* corresponding author)
5. **Huanle Xu**, Yang Liu, Wing Cheong Lau, Jun Guo and Alex Liu, "Efficient Online Resource Allocation in Heterogeneous Clusters with Machine Variability", in the Procs. of IEEE Infocom 2019, to appear.
6. Yang Liu, **Huanle Xu*** and Wing Cheong Lau, "Online Job Scheduling with Resource Packing on a Cluster of Heterogeneous Servers", in the Procs. of IEEE Infocom 2019, to appear. (* co-first author)
7. **Huanle Xu**, Gustavo de Veciana and Wing Cheong Lau, "Addressing Job Processing Variability Through Redundant Execution and Opportunistic Checkpointing: A Competitive Analysis", in IEEE Infocom 2017.
8. **Huanle Xu** and Wing Cheong Lau, "Task-Cloning Algorithms in a MapReduce Cluster with Competitive Performance Bounds", in IEEE ICDCS 2015.
9. **Huanle Xu** and Wing Cheong Lau, "Optimization for Speculative Execution in a MapReduce-like Cluster", in IEEE Infocom 2015.
10. **Huanle Xu**, Pili Hu, Wing Cheong Lau, Qiming Zhang and Yang Wu, "DPCP: A Protocol for Optimal Pull Coordination in Decentralized Social Networks", in IEEE Infocom 2015.
11. **Huanle Xu**, Ronghai Yang, Zhibo Yang and Wing Cheong Lau, "Solving Large Graph Problems in MapReduce-Like Frameworks via Optimized Parameter Configuration", in the 15th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP), 2015.
12. **Huanle Xu** and Wing Cheong Lau, "Speculative Execution for a Single Job in a MapReduce-like System", in IEEE International Conference on Cloud Computing (IEEE Cloud), 2014.
13. **Huanle Xu** and Wing Cheong Lau, "Resource Optimization for Speculative Execution in a MapReduce Cluster" (PhD Forum), in IEEE ICNP 2013.
14. Ruohan Gao, **Huanle Xu**, Pili Hu and Wing Cheong Lau, "Accelerating Graph Mining Algorithms via Uniform Random Edge Sampling", in IEEE ICC 2016.
15. Kenneth W. Shum, Hanxu Hou, Minghua Chen, **Huanle Xu** and Hui Li, "BASIC Codes: Low-Complexity Regenerating Codes for Distributed Storage Systems", in IEEE International Symposium on Information Theory (IEEE ISIT), 2014.

HONORS/ AWARDS

- Reaching Out Award of CUHK May 2016

- Overseas Research Attachment Programme Award of CUHK — Oct 2015
- Student Travel Grant for MLSS Beijing — June 2014
- Student Travel Grant for ICNP — Oct 2013
- 1st Prize in National Mathematical Contest in Modeling — Nov 2011
- 3rd Prize in National Mathematical Tournament in Modeling (23/1772) — May 2011

GRADUATE COURSEWORK

Information Theory
Random Process
Big Data Analytics
Optimization in Networks and Systems
Foundations of Optimization
Randomness and Computation
Machine Learning

TEACHING ASSISTANT EXPERIENCES

Signal and Systems
Principles of Communication Systems
Advanced Topics in Cloud Computing
Operation and Optimization Methods
Networking Protocols and Systems
Telecommunication Switching and Network Systems
Big Data Systems and Information Processing

SKILLS

- C/C++, Matlab, Java, Python
- Latex, Git

PROFESSIONAL SERVICES

- TPC Member for IFIP Networking 2019
- Reviewer for IEEE Infocom, IEEE ICC, IEEE Globecom
- Student Volunteer for ACM Sigcomm 2013, IEEE Infocom 2015

REFERENCES

Prof. Wing Cheong Lau (Dissertation Advisor)
Director of Mobile Technologies Center
Dept. of Information Engineering
The Chinese University of Hong Kong
Shatin, N.T., Hong Kong
Email: wclau@ie.cuhk.edu.hk
Tel: +852 3943-8356

Prof. Gustavo de Veciana (IEEE Fellow)
Dept. of Electrical and Computer Engineering
The University of Texas at Austin
1 University Station C0803
Austin, TX 78712-0240
Email: gustavo@ece.utexas.edu
Tel: +1 512-471-1573

Prof. Dah Ming Chiu (IEEE Fellow)
Dept. Information Engineering
The Chinese University of Hong Kong

Shatin, N.T., Hong Kong
Email: dmchiu@ie.cuhk.edu.hk
Tel: +852 3943-8357