Hao Wang

Affiliation

Edward S. Rogers Sr. Department of Electrical and Computer Engineering
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Personal Information

Citizenship Chinese

Education

University of Toronto, Toronto, Ontario, Canada
Department of Electrical and Computer Engineering

- ♢ **Ph.D. candidate**, Electrical and Computer Engineering, Sept. 2015 – Present
  - ▷ *Advisor:* Baochun Li, Department of Electrical and Computer Engineering

Shanghai Jiao Tong University, Shanghai, People's Republic of China
School of Electronic Information and Electrical Engineering

- ♢ **M.Engr.**, Software Engineering, Mar. 2015
  - ▷ *Dissertation:* "Generic and Accurate Traffic Prediction for Data-Parallel Cluster Computing"
  - ▷ *Advisor:* Haibing Guan, Department of Computer Science
    Zhengwei Qi, School of Software Engineering
- ♢ **B.Engr.**, Information Security, Jul. 2012

Research Interests

Large-scale data analytics, machine learning system, distributed computing, cloud computing, datacenter networking.

Research and Industry Experience

Research Assistant, supervised by Prof. Baochun Li **Sept. 2015 – Present**
University of Toronto, Toronto

Research Intern, supervised by Dr. Yongqiang Xiong **Aug. 2013 – Aug. 2014**
Microsoft Research Asia, Beijing, P. R. China

Visiting Research Assistant, supervised by Prof. Kai Chen **Nov. 2013 – Dec. 2014**
Hong Kong University of Science and Technology, Hong Kong, P. R. China

Co-fonder and Full-Stack Developer **Jul. 2013 – Nov. 2013**
Ramy Tech Inc., Shanghai, P. R. China

Development Intern on Cloud performance tuning **Dec. 2011 – Dec. 2012**
Intel Asia-Pacific Research and Development Ltd., Shanghai, P. R. China

Research Assistant, Supervised by Dr. Xiaochao Zi **Nov. 2009 – Nov. 2010**
Shanghai Jiao Tong University, Shanghai, P. R. China

Teaching Experience

APS1203: Teaching Engineering in Higher Education **Fall 2019**
University of Toronto, Toronto

A course training senior Ph.D. candidates on course design, lecturing techniques, assessment strategy, learning styles and technology tools.

Teaching Assistant **Sept. 2015 – Present**
University of Toronto, Toronto

- ECE 444: Software Engineering **Fall 2017 – 2019**
- CSC 454: Computer Systems Programming **Fall 2018**
- CSC 369: Operating Systems **Summer 2017**
- ECE 344: Operating Systems **Fall 2016**
- ECE 454: Computer Systems Programming **Fall 2018**
- CSC 343: Introduction to Databases **Summer 2016**
- ECE 353: Systems Software **Winter 2016 – 2019**
- CSC 458: Computer Networks **Fall 2015 – 2016**

Publications

◊ **Journal Articles** (in reverse chronological order)

[J1] **Hao Wang**, Di Niu, Baochun Li. "Turbo: Dynamic and Decentralized Global Analytics via Machine Learning," in *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, under submission.

[J2] **Hao Wang**, Baochun Li. "Mitigating Bottlenecks in Wide Area Data Analytics via Machine Learning," in *IEEE Transactions on Network Science and Engineering (TNSE)*, 2018.

[J3] Wei Bai, Li Chen, Kai Chen, Dongsu Han, Chen Tian, **Hao Wang**. "Information-Agnostic Flow Scheduling for Commodity Data Centers," in *IEEE/ACM Transactions on Networking (ToN)*, 2017.

[J4] Hong Zhang, Kai Chen, Wei Bai, Dongsu Han, Chen Tian, **Hao Wang**, Haibing Guan, Ming Zhang. "Guaranteeing Deadlines for Inter-Datacenter Transfers," in *IEEE/ACM Transactions on Networking (ToN)*, 2016

[J5] Shuihai Hu, Kai Chen, Haitao Wu, Wei Bai, Chang Lan, **Hao Wang**, Hongze Zhao, Chuanxiong Guo. "Explicit Path Control in Commodity Data Centers: Design and Applications," in *IEEE/ACM Transactions on Networking (ToN)*, 2015

[J6] Yang Peng, Kai Chen, Guohui Wang, Wei Bai, Yangming Zhao, **Hao Wang**, Yanhui Geng, Zhiqiang Ma, Lin Gu. "Towards Comprehensive Traffic Forecasting in Cloud Computing: Design and Application," in *IEEE/ACM Transactions on Networking (ToN)*, 2015.

◊ **Conference Papers** (in reverse chronological order)

[C1] **Hao Wang**, Di Niu, Baochun Li. "Distributed Machine Learning with a Serverless Architecture," in the Proceedings of IEEE INFOCOM 2019, Paris, France, April 29 - May 2, 2019. (acceptance ratio: 20%).

[C2] **Hao Wang**, Di Niu, Baochun Li. "Dynamic and Decentralized Global Analytics via Machine Learning," in the Proceedings of the *ACM Symposium on Cloud Computing 2018 (SoCC 2018)*, Carlsbad, California, October 11-13, 2018 (acceptance ratio: 24%).

[C3] **Hao Wang**, Baochun Li. "Lube: Mitigating Bottlenecks in Wide Area Data Analytics," in the Proceedings of the *9th USENIX Workshop on Hot Topics in Cloud Computing (HotCloud 2017)*, Santa Clara, California, July 10-11, 2017 (acceptance ratio: 32%).

[C4] Shuhao Liu, **Hao Wang**, Baochun Li. "Optimizing Shuffle in Wide-Area Data Analytics," in the Proceedings of the 37th International Conference on Distributed Computing Systems (ICDCS 2017), Atlanta, Georgia, June 5–8, 2017 (acceptance ratio: 17%).

[C5] **Hao Wang**, Li Chen, Kai Chen, Ziyang Li, Yiming Zhang, Haibing Guan, Zhengwei Qi, Dongsheng Li, Yanhui Geng. "FlowProphet: Generic and Accurate Traffic Prediction for Data-parallel Cluster Computing," in the Proceedings of the 35th *International Conference on Distributed Computing Systems (ICDCS 2015)*, Columbus, Ohio, June 29-July 2, 2015 (acceptance ratio: 13%).

[C6] Hong Zhang, Kai Chen, Wei Bai, Dongsu Han, Chen Tian, **Hao Wang**, Haibing Guan, Ming Zhang. "Guaranteeing Deadlines for Inter-Datacenter Transfers," in the Proceedings of the *ACM European Conference on Computer Systems (EuroSys 2015)*, Bordeaux, France, April 21-24, 2015 (acceptance ratio: 21%).

[C7] Wei Bai, Li Chen, Kai Chen, Dongsu Han, Chen Tian, **Hao Wang**. "Practical Information-Agnostic Flow Scheduling for Data Center Networks," in the Proceedings of the *12th USENIX Symposium on Networked Systems Design and Implementation (NSDI 2015)*, Oakland, CA, May 4-6, 2015 (acceptance ratio: 20%).

[C8] Shuihai Hu, Kai Chen, Haitao Wu, Wei Bai, Chang Lan, **Hao Wang**, Hongze Zhao, Chuanxiong Guo. "Explicit Path Control in Commodity Data Centers: Design and Applications," in the Proceedings of the *12th USENIX Symposium on Networked Systems Design and Implementation (NSDI 2015)*, Oakland, CA, May 4-6, 2015 (acceptance ratio: 20%).

[C9] **Hao Wang**, Yangming Zhao, Haibing Guan. "On Pricing Schemes in Data Center Network with Game Theoretic Approach," in the Proceedings of the *23rd IEEE International Conference on Computer Communications and Networks (ICCCN 2014)*, Shanghai, China, August 4-7, 2014 (acceptance ratio: 28%).

◊ **Conference Posters** (in reverse chronological order)

[P1] **Hao Wang**, Di Niu, Baochun Li. "Dynamic and Decentralized Global Analytics via Machine Learning," the *ACM Symposium on Cloud Computing 2018 (SoCC 2018)*, Carlsbad, California, October 11-13, 2018

[P2] **Hao Wang**, Baochun Li. "Lube: Mitigating Bottlenecks in Wide Area Data Analytics," the *9th USENIX Workshop on Hot Topics in Cloud Computing (HotCloud 2017)*, Santa Clara, California, July 10-11, 2017

[P3] **Hao Wang**, Baochun Li. "Bottleneck Detection for Wide Area Data Analytics on the SAVI

Testbed," the *3th SAVI Annual General Meeting*, Toronto, Ontario, July 6, 2016

Scholarly Talks

Distributed Machine Learning with a Serverless Architecture **Apr. 2019**
IEEE INFOCOM, Paris, France

Optimizing Large Scale Data Analytics via Machine Learning **Jan. 2019**
Shanghai Jiao Tong University, Shanghai, China

Dynamic and Decentralized Global Analytics via Machine Learning **Oct. 2018**
ACM SoCC, Carlsbad, CA

Mitigating Bottlenecks in Wide Area Data Analytics **Jul. 2017**
ACM HotCloud, Santa Clara, CA

Generic and Accurate Traffic Prediction for Data-parallel Cluster Computing **Oct. 2015**
IEEE ICDCS, Columbus, OH

On Pricing Schemes in Data Center Network with Game Theoretic Approach **Oct. 2014**
IEEE ICCCN, Shanghai, China

Professional Services

- ◊ Web Chair: IEEE ICNP 2017
- ◊ Reviewer for Journal Manuscript Submissions: IEEE Transactions on Networking, IEEE Transactions on Network Science and Engineering, IEEE Transactions on Big Data, Multimedia Systems Springer Journals, IEEE Access
- ◊ Reviewer for Conference Manuscript Submissions: ACM SIGCOMM poster, USENIX HotCloud, ACM Multimedia, ACM MMSys, ACM NOSSDAV, IFIP Networking, IEEE INFOCOM, IEEE IWQoS, IEEE GLOBECOM, IEEE IC2E, WiOpt, ACM/IEEE IoTDI

Honours and Awards

- ◊ **DiDi Graduate Awards** ($10,000 CAD), Didi Chuxing Technology Co. 2019
- ◊ **Best In-session Presentation Award**, INFOCOM'19, IEEE 2019
- ◊ **Doctoral Completion Award** ($18,000 CAD), ECE Department, University of Toronto 2019
- ◊ **SGS Conference Grant** ($1,000 CAD), School of Graduate Studies, University of Toronto 2018
- ◊ **Student Scholarships** ($900 USD), SoCC'18, ACM 2018
- ◊ **University of Toronto Fellowship**, Department of ECE, University of Toronto 2015
- ◊ **Edward S. Rogers Sr. Graduate Scholarships**, University of Toronto 2015
- ◊ **Yunfeng Prize** (Top 1%), the 2^{nd} Aliyun Worldwide Developer Conference, Alibaba Inc. 2013
- ◊ **The Second-Class Postgraduate Scholarship**, Shanghai Jiao Tong University 2012
- ◊ **The 3rd Prize**, the 4^{th} National College Information Security Contest 2011
- ◊ **Successful Participant Award**, Mathematical Contest in Modeling (MCM) 2011
- ◊ **The Second-Class Academic Excellence Scholarship**, Shanghai Jiao Tong University 2009

Grant Writing Experience

Working as a main technical contributor in the following grant applications:

- *NSERC Strategic Grant*, "Online Monitoring and Performance Optimization on Data Analytic Applications across Geo-Distributed Datacenters", PI: Baochun Li; Co-Applicants: Ding Yuan, Micheal Stumm 2016
- *NSERC Collaborative Research and Development (CRD) Grant*, "Performance Optimization for Multi-Datacenter Cloud Platforms", PI: Baochun Li 2016
- *NSERC Collaborative Research and Development (CRD) Grant*, "Optimizing Geo-Distributed Data Analytics Across Multiple Datacenters", PI: Baochun Li 2017
- *NSERC Collaborative Research and Development (CRD) Grant*, "Towards a Quantitative Understanding of Short Texts with Deep Learning", PI: Baochun Li 2019
- *Compute Canada Resources for Research Groups (RRG) Competition*, "Performance Optimization for Large Scale Data Analytics", PI: Baochun Li 2019

Mentoring

Maliha Islam, undergraduate student at *University of Toronto* **Sept. 2019 – Present**
Thesis title: "Optimizing Parallelism in Federated Learning"

Jeffrey Nguyen, undergraduate student at *University of Toronto* **Sept. 2019 – Present**
Thesis title: "Masking the Topic: a Topic Model for Short Texts"

Haobo Ding, undergraduate student at *University of Toronto* **Sept. 2018 – Apr. 2019**
Thesis title: "Speedup Straggler Workers in Distributed Machine Learning"

Yudian Shi, undergraduate student at *University of Toronto* **Sept. 2018 – Apr. 2019**
Thesis title: "Speeding Up Distributed Machine Learning with a Serverless Architecture"

Zhongyang Xiao, undergraduate student at *University of Toronto* **Sept. 2016 – Apr. 2017**
Thesis title: "Identifying Runtime Performance Bottlenecks of Spark Task Scheduler"

Luyuan Chen, undergraduate student at *University of Toronto* **Sept. 2016 – Apr. 2017**
Thesis title: "Optimizing SparkSQL using Machine Learning"

Shing-Chun Tse and Kai-Chung Law, undergraduate students at *Hong Kong University of Science and Technology* **Dec. 2013 – Dec. 2014**
Research topic: "Studying and Building a Software-Defined Network"

References

Baochun Li, IEEE Fellow, Professor
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Di Niu, IEEE Member, Associate Professor
Department of Electrical and Computer Engineering
University of Alberta, 116 St. and 85 Ave., Edmonton, Alberta T6G 2R3, Canada
Phone: +1-780-616-1022
Email: dniu@ualberta.ca
Web: `https://sites.ualberta.ca/~dniu`