

Hao Wang

AFFILIATION	Edward S. Rogers Sr. Department of Electrical and Computer Engineering University of Toronto 10 King's College Road Toronto, Ontario M5S 3G4, Canada	<i>Email:</i> haowang@ece.utoronto.ca <i>Web:</i> http://www.haow.ca/ <i>Mobile:</i> +1 (647) 891-0836
PERSONAL INFORMATION	<i>Citizenship</i> Chinese	
EDUCATION	University of Toronto , Toronto, Ontario, Canada <i>Department of Electrical and Computer Engineering</i> <ul style="list-style-type: none">◇ Ph.D. candidate, Electrical and Computer Engineering, Sept. 2015 – Present<ul style="list-style-type: none">▷ <i>Advisor:</i> Prof. Baochun Li, Department of Electrical and Computer Engineering Shanghai Jiao Tong University, Shanghai, People's Republic of China <i>School of Electronic Information and Electrical Engineering</i><ul style="list-style-type: none">◇ M.Engr., Software Engineering, Mar. 2015<ul style="list-style-type: none">▷ <i>Dissertation:</i> "Generic and Accurate Traffic Prediction for Data-Parallel Clusters"▷ <i>Advisor:</i> Prof. Haibing Guan, Department of Computer Science Prof. Zhengwei Qi, School of Software Engineering◇ B.Engr., Information Security, Jul. 2012<ul style="list-style-type: none">▷ <i>Dissertation:</i> "Performance Evaluation and Tuning of Cloud Computing"	
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 <i>University of Toronto</i> , Toronto Sept. 2015 – Present Research Intern , supervised by Dr. Yongqiang Xiong <i>Microsoft Research Asia</i> , Beijing, P. R. China Aug. 2013 – Aug. 2014 Visiting Research Assistant , supervised by Prof. Kai Chen <i>Hong Kong University of Science and Technology</i> , Hong Kong, P. R. China Nov. 2013 – Dec. 2014 Co-fonder and Full-Stack Developer <i>Ramy Tech Inc.</i> , Shanghai, P. R. China Jul. 2013 – Nov. 2013 Development Intern on Cloud performance tuning <i>Intel Asia-Pacific Research and Development Ltd.</i> , Shanghai, P. R. China Dec. 2011 – Dec. 2012 Research Assistant , Supervised by Dr. Xiaochao Zi <i>Shanghai Jiao Tong University</i> , Shanghai, P. R. China Nov. 2009 – Nov. 2010	

◇ **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-Datcenter 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 <i>IEEE INFOCOM</i> , Paris, France	Apr. 2019
	Optimizing Large Scale Data Analytics via Machine Learning <i>Shanghai Jiao Tong University</i> , Shanghai, China	Jan. 2019
	Dynamic and Decentralized Global Analytics via Machine Learning <i>ACM SoCC</i> , Carlsbad, CA	Oct. 2018
	Mitigating Bottlenecks in Wide Area Data Analytics <i>ACM HotCloud</i> , Santa Clara, CA	Jul. 2017
	Generic and Accurate Traffic Prediction for Data-parallel Cluster Computing <i>IEEE ICDCS</i> , Columbus, OH	Oct. 2015
	On Pricing Schemes in Data Center Network with Game Theoretic Approach <i>IEEE ICCCN</i> , Shanghai, China	Oct. 2014

PROFESSIONAL SERVICES	<ul style="list-style-type: none"> ◇ 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 Hot-Cloud, ACM Multimedia, ACM MMSys, ACM NOSSDAV, IFIP Networking, IEEE INFOCOM, IEEE IWQoS, IEEE GLOBECOM, IEEE IC2E, WiOpt, ACM/IEEE IoTDI 	
HONOURS AND AWARDS	<ul style="list-style-type: none"> ◇ 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 2nd Aliyun Worldwide Developer Conference, Alibaba Inc. 2013 ◇ The Second-Class Postgraduate Scholarship, Shanghai Jiao Tong University 2012 ◇ The 3rd Prize, the 4th National College Information Security Contest 2011 ◇ The Second-Class Academic Excellence Scholarship, Shanghai Jiao Tong University 2009 	
GRANT WRITING EXPERIENCE	<p>Worked as a main technical contributor in the following grant applications. <i>The NSERC is the largest funder of scientific research in Canada, which is similar to the NSF in US.</i></p> <ul style="list-style-type: none"> ▷ NSERC Strategic Grant 2016 "Online Monitoring and Performance Optimization on Data Analytic Applications across Geo-Distributed Datacenters", PI: Baochun Li; Co-Applicants: Ding Yuan, Micheal Stumm ▷ NSERC Collaborative Research and Development (CRD) Grant 2016 "Performance Optimization for Multi-Datacenter Cloud Platforms", PI: Baochun Li ▷ NSERC Collaborative Research and Development (CRD) Grant 2017 "Optimizing Geo-Distributed Data Analytics Across Multiple Datacenters", PI: Baochun Li ▷ NSERC Collaborative Research and Development (CRD) Grant 2019 "Towards a Quantitative Understanding of Short Texts with Deep Learning", PI: Baochun Li ▷ Research Gift from Orbis Investment Management Inc. 2019 "Sentiment Analysis and Topic Modeling on Short Texts", PI: Baochun Li ▷ Compute Canada Resources for Research Groups (RRG) Competition 2019 "Performance Optimization for Large Scale Data Analytics", PI: Baochun Li 	
TEACHING EXPERIENCE	APS1203: Teaching Engineering in Higher Education <i>University of Toronto, Toronto</i>	Fall 2019

A course for 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
- ▷ CSC 343: Introduction to Databases Summer 2016
- ▷ ECE 353: Systems Software Winter 2016 – 2019
- ▷ CSC 458: Computer Networks Fall 2015 – 2016

MENTORING

Maliha Islam, female 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”

Zakhary Kaplan, undergraduate student at *University of Toronto* Jun. 2019 – Aug. 2019
Research topic: “Optimizing Federated Learning on Non-IID Data with Reinforcement Learning”

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

Yudian Shi, female 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”
Software Enginner at Amazon

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

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
Bell Canada Endowed Chair in Computer Engineering
Department of Electrical and Computer Engineering
University of Toronto, 10 Kings College Rd., Toronto, Ontario M5S 3G4, Canada
Phone: +1-416-946-7338
Email: bli@ece.toronto.edu
Web: <http://iqua.ece.toronto.edu/bli/>

Ben Liang, IEEE Fellow, Professor
Department of Electrical and Computer Engineering
University of Toronto, 10 Kings College Rd., Toronto, Ontario M5S 3G4, Canada
Phone: +1-416-946-8614
Email: liang@ece.utoronto.ca
Web: <https://www.comm.utoronto.ca/~liang/>

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>

Michael Stumm, Professor
Department of Electrical and Computer Engineering
University of Toronto, 10 Kings College Rd., Toronto, Ontario M5S 3G4, Canada
Phone: +1-416-978-3226
Email: stumm@eecg.toronto.edu
Web: <http://www.eecg.toronto.edu/~stumm/>