Yong Deng

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RESEARCH EXPERIENCE

University of Toronto — Toronto, Ontario
Postdoctoral Fellow — 11/2021 to Current
- Research project: Design of coded distributed computing scheme for heterogeneous machine learning jobs
- Supervisor: Prof. Min Dong; Co-supervisor: Prof. Ben Liang

Ontario Tech University — Oshawa, Canada
Visiting Researcher — 01/2016 to 1/2017
- Research project: Security, trust, and privacy in vehicular networks
- Supervisor: Prof. Xiaodong Lin

EDUCATION

Ontario Tech University — Oshawa, Canada
Ph.D., Electrical and Computer Engineering — 01/2018 to 10/2021
Thesis: Coded caching for cache-aided communication and computing with nonuniform demands
Supervisor: Prof. Min Dong

Ontario Tech University — Oshawa, Canada
Ph.D. student, Computer Science — 01/2017 to 12/2017
Research topics: Security, trust, and privacy in vehicular networks
Supervisor: Prof. Xiaodong Lin
Note: Supervisor left school, switched to the Ph.D. in Electrical and Computer Engineering program

Zhejiang Gongshang University — Hangzhou, China
Master of Science, Computer Science — 09/2013 to 06/2016
Thesis: Cooperation dynamics in Openstack-based cloud networks
Supervisor: Prof. Guiyi Wei

Wuhan University of Technology — Wuhan, China
Bachelor of Science, Computer Science — 09/2008 to 06/2012
Major: Networking

RESEARCH SUMMARY

My research mainly focuses on utilizing optimization techniques to solve practical problems in networks. I am currently working on the optimization of MapReduce-based coded distributed computing in heterogeneous networks, with a special interest in speeding up the computing of machining learning jobs. My Ph.D. thesis focuses on the optimization of coded caching and distributed computing for heterogeneous networks. I am also interested in looking into research problems about the mechanism design and security in coded caching and distributed computing networks. I also have research experiences in algorithmic mechanism design, network security, differential privacy and applied cryptography.

TEACHING EXPERIENCE

Ontario Tech University — Oshawa, Ontario
Lab Instructor: Security and Forensics — 04/2016 to 12/2017
Lab Instructor: Computer Architecture — 01/2018 to 12/2021
- Designing lab materials and supervising labs independently
- Marking for the lab reports
- Designing online based labs materials to support transforming the lab session into online form

Ontario Tech University — Oshawa, Ontario
Teaching Assistant: Operating Systems, — 04/2016 to 12/2021
- Leading weekly tutorials, marking for assignments and invigilate exams
- Holding weekly office hours to answer questions from students
- Designing online based tutorials to support transforming the lab session into online form

SCHOLARSHIPS

Ontario Tech University
Dean's scholarship, Faculty of Engineering and Applied Science, 2018.
Zhejiang Gongshang University
National Scholarship for Postgraduate/Graduate student, 2015.
Wuhan University of Technology
National Encouragement scholarship of China (undergraduate student), 2011.

PUBLICATIONS

Coded Distributed Computing:

1. Yong Deng, and Min Dong, 'Heterogeneous Coded Distributed Computing with Nonuniform Input File Popularity," in *Proc. IEEE International Conference on Communications (ICC)*, Seoul, South Korea, May 16-20, 2022.

Coded Caching:

1. Yong Deng and Min Dong, "Memory-Rate Tradeoff for Caching with Uncoded Placement under Nonuniform Random Demands," in *IEEE Transactions on Information Theory*, Jul., 2022, doi: 10.1109/TIT.2022.3193316. (Early access.)

2. Yong Deng and Min Dong, "Fundamental Structure of Optimal Cache Placement for Coded Caching with Nonuniform Demands," in *IEEE Transactions on Information Theory*, May, 2022, doi: 10.1109/TIT.2022.3179266. (Early access.)

3. Yong Deng and Min Dong, "Memory-Rate Tradeoff for Decentralized Caching under Nonuniform File Popularity," in *Proc. 19th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt)*, Oct. 18-21, 2021.

4. Yong Deng and Min Dong, "Memory-Rate Tradeoff for Caching with Uncoded Placement under Nonuniform File Popularity," in *Proc. 54th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, Nov. 3-6, 2020.

5. Yong Deng and Min Dong, "Optimal Uncoded Placement and File Grouping Structure for Improved Coded Caching under Nonuniform Popularity," in *Proc. 18th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt)*, Jun. 15-19, 2020.

6. Yong Deng and Min Dong, "Subpacketization Level in Optimal Placement for Coded Caching with Nonuniform File Popularity," in *Proc. 53rd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, Nov. 3-6, 2019.

7. Yong Deng and Min Dong, "Optimal Cache Placement for Modified Coded Caching with Arbitrary Cache Size," in *Proc. 20th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, Jul. 2-5, 2019.

Network Security and Mechanism Design:

1. Abdulrahman Alamer, Yong Deng, Guiyi Wei, and Xiaodong Lin, "Collaborative Security in Vehicular Cloud Computing: A Game Theoretic View," *IEEE Network,* vol. 32, no. 3, pp. 72-77, Jun. 2018.

2. Abdulrahman Alamer, Yong Deng, and Xiaodong Lin, "A Privacy-Preserving and Truthful Tendering Framework for Vehicle Cloud Computing," in *Proc. IEEE International Conference on Communications (ICC)*, Paris, France, May 1-5, 2017.

3. Abdulrahman Alamer, Yong Deng, and Xiaodong Lin, "Secure and Privacy-Preserving Task Announcement in Vehicular Cloud," in *Proc. IEEE International Conference on Wireless Communications and Signal Processing (WCSP)*, Oct. 21-23, 2017.

MANUSCRIPTS UNDER REVIEW

1. Yong Deng, and Min Dong, 'A Novel Nested Coded Delivery Strategy for Coded Caching under Nonuniform File Popularity," submitted to IEEE Communication Letters, Aug., 2022.

2. Yong Deng, and Min Dong, "Decentralized Caching under Nonuniform File Popularity and Size: Memory-Rate Tradeoff Characterization," submitted to IEEE/ACM Transactions on Networking, Jul., 2022.

RESEARCH PROJECT EXPERIENCES

The bandwidth and data flow distribution of data center network based on spatial game theory 12/2013 to 12/2015

- Graduate student innovation fund project of Zhejiang Province
- Principal Investigator.

Semi-active, remote, real Time, health care monitor system for community based on wireless ad hoc networks 12/2013 to 12/2015

- Key Project of Science and Technology Plan of Zhejiang Province
- participant.

INDUSTRY EXPERIENCE

Vanceinfo Technologies Inc, Wuhan Branch Wuhan, China

Software Engineer 06/2012 to 08/2013

- Develop a network traffic monitoring system to monitor the network traffic data and generate report as needed
- Mainly using Linux C/C++ and SQL server, Shell, Java and JSP

TECHNICAL SKILLS

- Proficient in Linux C/C++ system programming
- Proficient and experienced in formulating and solving optimization problems in various disciplines
- Experienced in working with cloud computing and big data platforms, including Openstack and Hadoop
- Sufficient programming skills, including Java, Python, Matlab, JSP, Javascript, Shell

REFERENCES

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Deptartment of Electrical, Computer and Software Engineering
Ontario Tech University
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Tel: (905) 721-8668 Ext. 3840
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Relation: Supervisor

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Relation: Supervisor

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Relation: Collaborator