

Sisi Duan *Ph.D.*

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Education

Ph.D. 2014 University of California Davis, Computer Science
B.Eng. 2010 The University of Hong Kong, Electrical and Electronic Engineering

Experience in Higher Education

2017 - Now University of Maryland, Baltimore County
Assistant Professor, Department of Information Systems
2015-2017 Oak Ridge National Laboratory
Weinberg Fellow, Computational Data Analytics Group
Jan-Jul, 2015 University of California, Davis
Postdoctoral Fellow, Department of Computer Science
Jan-Mar, 2014 University of Stavanger, Norway
Visiting Scholar, Department of Electrical Engineering and Computer Science

Experience other than Higher Education

2008-2009 HSBC, Hong Kong
FX/MM Product Solution Specialist, Department of FX, MM, Balance Sheet Product

Honors Received

2019 Named as one of the Maryland's Cyber Warrior Women
2017 Best Paper in the Networking Track, ICDCN
2015 Alvin M. Weinberg Distinguished Fellowship, ORNL
2014 Graduate Student Travel Award, UC Davis
2014 Leiv Eiriksson Mobility Grant, The Research Council of Norway
2014 Top 100 in Google Code Jam I/O for women
2014 Best Paper Candidate Award, SRDS
2010 Block Grant Fellowship, Office of Graduate Studies, UC Davis

Research Support and Fellowships

External

2019-2022 \$549,718. National Science Foundation.
Partnership for Innovation - Research Partnership (PFI-RP) program.
PI: Yelena Yesha. coPIs: **Sisi Duan**, Haibin Zhang, Jeb Linton (IBM)
Building a Modular, Reliable, Scalable, and Secure Internet of Things Infrastructure
2018-2019 \$115,000. Maryland Technology Development Corporation.
Maryland Innovation Initiative (MII) program.
PI: Haibin Zhang. coPIs: **Sisi Duan**, Yelena Yesha
Building a Scalable and Intrusion-Tolerant Permissioned Blockchain
2018-2020 \$100,000. Department of Homeland Security
PI: **Sisi Duan**. coPIs: Haibin Zhang, Yelena Yesha
Permissioned Blockchains for IoT, IoMT, and Storage

Internal

2018 \$6,000. Summer Research Faculty Fellowship (SURFF), UMBC
PI: **Sisi Duan**
Rethinking Byzantine Fault Tolerance at Scale in Blockchain Settings

Others (UMBC is not a direct recipient.)

- 2018-2021 5,856,000 NOK. Research Council of Norway.
 PI: Hein Meling. coPIs: Roman Vitenberg, Frank Eliassen, Fabiola Greve, Bettina Kemme, Kaiwen Zhang, Ken Birman, Robbert van Renesse, Keith Marzullo, Susan J. Winter, **Sisi Duan**, Haibin Zhang, Nalini Venkatasubramanian, Deborah Agarwal, and Sean Peisert
CREDENCE: Collaboration Network for Excellent Education and Research in Dependable and Secure Distributed Systems
- Prior to UMBC*
 2015-2017 \$149,200, Oak Ridge National Laboratory
 PI: **Sisi Duan**
Data Integrity and Resilient Topologies in the Smart Grid
- 2014 104,000 NOK, The Research Council of Norway
 Leiv Eiriksson Mobility Program
 PI: **Sisi Duan**
BSID: Byzantine Fault Tolerance from Specification-Based Intrusion Detection
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Students

PhD Advisees

- Main advisees: Xin Wang (Fall 2018-present), James Clavin (Summer 2018-present)
- Co-advisees: Chao Liu (Co-advised with Haibin Zhang, CSEE, Fall 2018-present), Shuai Xu (Co-advised with Haibin Zhang, CSEE, Fall 2018-present), Cyrus Bonyadi (Co-advised with Haibin Zhang, CSEE, Fall 2018-present), Yusen Wu (Co-advised with Haibin Zhang, CSEE, Spring 2019-present)

Master Students

- Advisees: Yunyue Zeng (Fall 2018-present)
- Independent Study: Rashmi C. G., Tejaswini Yella, Kushagra Verma, Shruthi Kumari Bezgam, Raj Rajagopalan, Shreya Keni, Arushi Singh

PhD Thesis Committee

- Md Abudullah Al Hafiz Khan, Lawrence Sebald (CSEE), Samson Oni

Master Thesis Committee

- Savio Kay, Ketki Joshi, Abhishek Mahindrakar

Undergraduate Students

- Independent Study: Sara Gondal, Musarrat Khan
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Teaching

IS 410 Introduction to Database Design	Fall 2017
IS 651 Distributed Systems	Fall 2018
IS 410/610 Introduction to Database Design	Spring 2019
IS 698/800 Advanced Distributed Systems	Spring 2019
IS 651 Distributed Systems	Fall 2019
IS 651 Distributed Systems	Spring 2020

Publications

Conference Proceedings

- Chao Liu, Sisi Duan, and Haibin Zhang. *EPIC: Efficient Asynchronous BFT with Adaptive Security*, DSN 2020. (Acceptance Rate: 16.5%)
- James Clavin, Sisi Duan. *ByzGame, a Visualized and Understandable BFT Consensus*, Middleware 2019.
- Sisi Duan, Micheal K. Reiter, and Haibin Zhang. *BEAT: Asynchronous BFT Made Practical*, pages 2028–2041, CCS 2018. (Acceptance Rate: 16.6%)
- Siddhant Goenka, Sisi Duan and Haibin Zhang. *A Formal Treatment of Efficient Byzantine Routing Against Fully Byzantine Adversary*, IEEE NCA 2018. (Acceptance Rate: 22.9%)

- Liangzhe Chen, Xinfeng Xu, Sangkeun Lee, Sisi Duan, Alfonso G. Tarditi, Supriya Chinthavali, and B. Aditya Prakash. *HotSpots: Failure Cascades on Heterogeneous Critical Infrastructure Networks*, pages 1599–1607, CIKM 2017. (Acceptance Rate: 20%)
- Sisi Duan, Micheal K. Reiter, and Haibin Zhang. *Secure Causal Atomic Broadcast, Revisited*, pages 61–72, DSN 2017. (Acceptance Rate: 22.2%)
- Sisi Duan, Sangkeun Lee, Supriya Chinthavali, and Mallikarjun Shankar. *Best Effort Broadcast under Cascading Failures in Interdependent Networks*, ACM ICDCN 2017: 27. *One of the 3 best papers of the networking track.*
- Sisi Duan, Yun Li, and Karl Levitt. *Cost Sensitive Moving Target Consensus*, pages 272–281, IEEE NCA 2016. (Acceptance Rate: 27.6%)
- Sisi Duan, Lucas Nicely, and Haibin Zhang. *Byzantine Reliable Broadcast in Sparse Networks*, pages 175–182, IEEE NCA 2016. (Acceptance Rate: 27.6%)
- Sisi Duan, Sangkeun Lee, Supriya Chinthavali, and Mallikarjun Shankar. *Reliable Communication Models in Interdependent Critical Infrastructure Networks*, pages 152–157, IEEE RWS 2016.
- Sisi Duan and Haibin Zhang. *Practical Randomized and Confidential Byzantine Replication*, pages 187–196, IEEE SRDS 2016. (Acceptance Rate: 32.5%)
- Sisi Duan and Jingtao Sun. *Energy Management Policies in Distributed Residential Energy Systems*, pages 121–133, IEEE IDCS 2016.
- Sangkeun Lee, Supriya Chinthavali, Sisi Duan, and Malikarjun Shankar. *Utilizing Semantic Big Data for realizing a National-scale Infrastructure Vulnerability Analysis System*, ACM SBD@SIGMOD 2016:3.
- Sisi Duan and Jingtao Sun. *A Self-Adaptive Middleware for Efficient Routing in Distributed Sensor Networks*, pages 322–327, IEEE SMC 2015.
- Sisi Duan, Jingtao Sun, and Sean Peisert. *Towards a Self-Adaptive Middleware for Building Reliable Publish/Subscribe Systems*, pages 157–168, IEEE IDCS 2015.
- Sisi Duan, Hein Meling, Sean Peisert, and Haibin Zhang. *BChain: Byzantine Replication with High Throughput and Embedded Reconfiguration*, pages 91–106, OPODIS 2014. (Acceptance Rate: 32.7%)
- Sisi Duan, Karl Levitt, Hein Meling, Sean Peisert, and Haibin Zhang. *ByzID: Byzantine Fault Tolerance from Intrusion Detection*, pages 253–264, IEEE SRDS 2014. *Best Paper Candidate Award.* (Acceptance Rate: 30.3%)
- Tiancheng Chang, Sisi Duan, Hein Meling, Sean Peisert, and Haibin Zhang. *P2S: A Fault-Tolerant Publish/Subscribe Infrastructure*, pages 189–197, ACM DEBS 2014. (Acceptance Rate: 9%)

Journal

- Sisi Duan and Bilal Ayyub. *Assessment Methods of Network Resilience for Cyber-Human-Physical Systems*, ASCE-ASME Journal of Risk and Uncertainty Analysis, 6(1), 2020. (Online: Oct 2019)
- Sisi Duan, Sangkeun Lee, Supriya Chinthavali, and Mallikarjun Shankar. *Best Effort Broadcast under Cascading Failures in Interdependent Critical Infrastructure Networks*, Pervasive and Mobile Computing, Vol. 43, pp.114-130, 2018. (Impact Factor: 2.974)
- Sisi Duan, Sean Peisert, and Karl Levitt. *hBFT: Speculative Byzantine Fault Tolerance With Minimum Cost*, 12(1), pages 58–70, IEEE Transactions on Dependable and Secure Computing, 2015. (Impact Factor: 4.41)

Presentations

Invited Talks

- Blockchain: What is it and how to use it? *Keynote. Workshop on Big Data Analytics of Cyber-Physical (Energy) Systems. Co-located with IGSC. Washington, D.C.* Oct 2019
- Chios: The Next Generation Permissioned Blockchain *Department of Homeland Security.* Aug 2019

- Blockchain: What is it and how to use it? *National Institute of Standards and Technology.* Apr 2019
- Building Resilient Distributed Systems from Byzantine Fault Tolerance. *Auburn University.* Mar 2017
- Building Resilient Distributed Systems from Byzantine Fault Tolerance. *University of Oklahoma.* Mar 2017
- Building Resilient Distributed Systems from Byzantine Fault Tolerance. *University of South Florida.* Mar 2017
- Resilience under Cascading Failures in Interdependent Distributed Systems. *University of Maryland Baltimore County.* Mar 2017
- Resilience under Cascading Failures in Interdependent Distributed Systems. *University of Idaho.* Mar 2017
- Building Resilient Distributed Systems from Byzantine Fault Tolerance. *United Technologies Research Center.* Feb 2017
- Building Resilient Distributed Systems from Byzantine Fault Tolerance. *Florida International University.* Feb 2017
- Reliable Communication under Cascading Failures in Interdependent Networks. *University of Connecticut.* Nov 2016
- Reliable Communication in Critical Infrastructure Networks. *CDA Group Seminar, Oak Ridge National Laboratory.* Sep 2016
- Building Secure and Reliable Distributed Systems. *Oak Ridge National Laboratory.* June 2015
- BChain: A Family of Practical Byzantine Fault-Tolerant Protocols with Fault Diagnosis. *GGCS Seminar, University of California, Davis.* Dec 2012
- BChain: A Family of Practical Byzantine Fault-Tolerant Protocols with Fault Diagnosis. *Security Lab Seminar, University of California, Davis.* Nov 2012

Conference Presentations

- Best Effort Broadcast under Cascading Failures in Interdependent Networks. *ICDCN. Hyderabad, India.* Jan 2017
- Cost Sensitive Moving Target Consensus. *NCA. Boston, MA.* Nov 2016
- Byzantine Reliable Broadcast in Sparse Networks. *NCA. Boston, MA.* Nov 2016
- ByzID: Byzantine Fault Tolerance from Intrusion Detection. *SRDS. Nara, Japan.* Oct 2014
- Byzantine Chain Protocol: Byzantine Agreement with Fault Diagnosis. *Tidal News Workshop. Stavanger, Norway.* Aug 2012

Professional Service

Conference/Workshop Organizing Committee

- NSF workshop: Global Transformation with Blockchain: From lab to app.

Conference/Workshop Program Committee/Session Chair

- CSIRW 2013, CISRC 2015-2018, NCA 2017-2019, UIC 2018, IDCS 2016, 2018-2019, BlockSEA 2018, BTSD 2019, IDC 2020

Conference External Reviewer

- ICDCS 2014, DSN 2016, RecSys 2016, SRDS 2017, ICNSC 2018

Journal Reviewer

- IEEE TKDE, IEEE TVT, IEEE TDSC, IEEE TOIT

Grant Panel/Reviewer

- NOW Domain Applied and Engineering Sciences (NOW Domain AES) 2019