WANXIN LI

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EDUCATION

University of Delaware Newark, DE, USA

- Ph.D. in Transportation Engineering 9/2018 - 5/2022
  - Dissertation: Frontiers in Blockchain for Secure Information Sharing in Next Generation Transportation Systems
  - Advisor: Prof. Mark Nejad
  - GPA: 4.0
- M.S. in Computer Science 9/2015 - 5/2017

Chongqing University Chongqing, China

- B.S. in Computer Science 9/2011 - 6/2015

RESEARCH INTERESTS

Security and privacy in distributed systems, including blockchain networks, connected and autonomous vehicular networks and Internet of Things

PUBLICATIONS (citations: 152, h-index: 6)

Peer-reviewed Journal Papers (Corresponding author is marked with *)

J1. ZK-BFT: A Zero-knowledge and Byzantine Fault Tolerant Consensus for Permissioned Blockchain Networks
W. Li, C. Meese, M. Nejad and H. Guo
IEEE Transactions on Network and Service Management. (impact factor: 4.2) - under review

J2. Aggregated Zero-knowledge Proof and Blockchain-Empowered Authentication for Autonomous Truck Platooning
W. Li, C. Meese, H. Guo and M. Nejad
IEEE Transactions on Intelligent Transportation Systems. (impact factor: 6.3) - under review

J3. A Hybrid Blockchain-Edge Architecture for Electronic Health Record Management with Attribute-based Cryptographic Mechanisms
H. Guo, **W. Li***, M. Nejad and C. Shen
IEEE Transactions on Network and Service Management. (impact factor: 4.2) - accepted with revisions

J4. A Hierarchical and Location-aware Consensus Protocol for IoT-Blockchain Applications
H. Guo, **W. Li*** and M. Nejad
IEEE Transactions on Network and Service Management. (impact factor: 4.2) - accepted with revisions

J5. Traffic Prediction using Artificial Intelligence: Review of Recent Advances and Emerging Opportunities
M. Shaygan, C. Meese, **W. Li**, X. Zhao and M. Nejad
Transportation Research Part C: Emerging Technologies. (impact factor: 8.1) - accepted with revisions

J6. Proof-of-Event Recording System for Autonomous Vehicles: A Blockchain-based Solution
H. Guo, **W. Li**, M. Nejad and C. Shen
IEEE Access, Vol. 8, pp. 182776-182786, 2020. (impact factor: 3.4)
DOI: 10.1109/ACCESS.2020.3029512

J7. Privacy-Preserving Traffic Management: A Blockchain and Zero-Knowledge Proof Inspired Approach
W. Li, H. Guo, M. Nejad and C. Shen
IEEE Access, Vol. 8, pp. 181733-181743, 2020. (impact factor: 3.4)
DOI: 10.1109/ACCESS.2020.3028189

Peer-reviewed Conference Papers

C1. BFRT: Blockchained Federated Learning for Real-time Traffic Flow Prediction
C. Meese, H. Chen, S. Asif, **W. Li**, C. Shen and M. Nejad
IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGrid), Taormina, Italy, May 16-19, 2022. - accepted

C2. A Location-based and Hierarchical Framework for Fast Consensus in Blockchain Networks
H. Guo, **W. Li** and M. Nejad
IEEE International Conference on Hot Information-Centric Networking (HotICN), Nanjing, China, November 25-27, 2021.
DOI: 10.1109/HotICN53262.2021.9680858

C3. P-CFT: A Privacy-preserving and Crash Fault Tolerant Consensus Algorithm for Permissioned Blockchains
W. Li, C. Meese, M. Nejad and H. Guo
IEEE International Conference on Hot Information-Centric Networking (HotICN), Nanjing, China, November 25-27, 2021.
DOI: 10.1109/HotICN53262.2021.9680829

C4. Location-aware Verification for Autonomous Truck Platooning Based on Blockchain and Zero-knowledge Proof
W. Li, C. Meese, Z. Zhong, H. Guo and M. Nejad
IEEE International Conference on Blockchain and Cryptocurrency (ICBC), Sydney, Australia, May 3-6, 2021. (acceptance rate: 18%)
DOI: 10.1109/ICBC51069.2021.9461116

C5. Blockchain-enabled Identity Verification for Safe Ridesharing Leveraging Zero-Knowledge Proof
W. Li, C. Meese, H. Hao and M. Nejad
IEEE International Conference on Hot Information-Centric Networking (HotICN), Hefei, China, December 12-14, 2020.
DOI: 10.1109/HotICN50779.2020.9350858

C6. Attribute-based Multi-Signature and Encryption for EHR Management: A Blockchain-based Solution
H. Guo, **W. Li**, E. Meamari, M. Nejad and C. Shen
IEEE International Conference on Blockchain and Cryptocurrency (ICBC), Toronto, Canada, May 2-6, 2020. (acceptance rate: 21%)
DOI: 10.1109/ICBC48266.2020.9169395

C7. Access Control for Electronic Health Records with Hybrid Blockchain-Edge Architecture
H. Guo, **W. Li**, M. Nejad and C. Shen
IEEE International Conference on Blockchain (Blockchain), Atlanta, USA, July 14-17, 2019. (acceptance rate: 15%)
DOI: 10.1109/Blockchain.2019.00015

C8. A Blockchain-based Architecture for Traffic Signal Control Systems
W. Li, M. Nejad and R. Zhang

IEEE International Congress on Internet of Things (ICIOT), Milano, Italy, July 8-13, 2019. (acceptance rate: 26%)
DOI: 10.1109/ICIOT.2019.00018

Technical Reports

T1. Snow Plow Route Optimization in Delaware
M. Li, A. Faghri, D. Yuan, **W. Li** and Q. Li
Delaware Department of Transportation (DelDOT), Rpt. DCT-269, 110 pp, April 2018.

Manuscripts in Preparation

M1. Blockchain-enabled Bidirectional and Privacy-preserving Authentication for Safe Ridesharing
W. Li, C. Meese, M. Nejad, Z. Zhong and H. Guo
IEEE Transactions on Network and Service Management. (impact factor: 4.2)

M2. A Bi-level Blockchain-based Federated Learning Architecture for Traffic Prediction
H. Guo, C. Meese, **W. Li***, H. Chen, M. Nejad, C. Shen
IEEE Transactions on Dependable and Secure Computing. (impact factor: 7.3)

M3. BFRT: Blockchained Federated Learning for Real-time Traffic Flow Prediction (Extension Study)
C. Meese, H. Chen, **W. Li**, S. Asif, C. Shen and M. Nejad
IEEE Transactions on Intelligent Transportation Systems. (impact factor: 6.5)

PRESENTATIONS & POSTERS

P1. P-CFT: A Privacy-preserving and Crash Fault Tolerant Consensus Algorithm for Permissioned Blockchains
IEEE International Conference on Hot Information-Centric Networking (HotICN), Nanjing, China, November 27, 2021.

P2. Blockchain-enhanced Traffic Management Approach
Department of Civil and Environmental Engineering, University of Delaware, Newark, DE, USA, Fall 2021.

P3. Location-aware Verification for Autonomous Truck Platooning Based on Blockchain and Zero-knowledge Proof
IEEE International Conference on Blockchain and Cryptocurrency (ICBC), Sydney, Australia, May 5, 2021.

P4. A Blockchain and Zero-Knowledge Proof Inspired Approach for Privacy-Preserving Traffic Management
International Workshop on Cyber-Physical Systems and Cyber-Resilience, Session IV: Blockchain Applications, Newark, DE, USA, March 11, 2021.

P5. Frontiers in Blockchain for Secure Information Sharing in Connected Vehicle Environments
Department of Civil and Environmental Engineering, University of Delaware, Newark, DE, USA, October 13, 2020.

P6. Attribute-based Multi-Signature and Encryption for EHR Management: A Blockchain-based Solution
IEEE International Conference on Blockchain and Cryptocurrency (ICBC), Toronto, Canada, May 4, 2020.

P7. Blockchain: From Digital Currencies to Industrial Innovations
Shandong Agricultural University, Tai'an, China, December 30, 2019.

P8. A Blockchain-based Architecture for Traffic Signal Control System
Department of Civil and Environmental Engineering, University of Delaware, Newark, DE, USA, October 30, 2019.

P9. Introduction to Hyperledger Fabric
Department of Computer and Information Sciences, University of Delaware, Newark, DE, USA, October 18, 2019.

P10. A Blockchain-based Architecture for Traffic Signal Control Systems
IEEE International Congress on Internet of Things (ICIOT), Milano, Italy, July 9, 2019.

P11. Defending Traffic Signal Control Systems from Spoofing Attacks: A Blockchain Approach
International Workshop on Cyber-Physical Systems and Cyber-Resilience, Session IV: Blockchains, Newark, DE, USA, March 20, 2019.

P12. A GIS-based Approach for Snow and Ice Removal Route Optimization to Improve Winter Maintenance Operations Management
Transportation Research Board (TRB) 98th Annual Meeting, Poster Session: 1567, Washington, DC, USA, January 18, 2019.

RESEARCH EXPERIENCE

University of Delaware Newark, DE, USA

- Research Assistant - Mobility of the Future Lab 9/2018 - Present
  - Project: Artificial Intelligence Enhanced Integrated Transportation Management System (AI-ITMS), Federal Highway Administration. ✎ This project is in collaboration with BlueHalo, Jacobs Engineering Group and Delaware Department of Transportation.
  - Project: An Artificial Intelligence Based System for Advanced Freeway Data Collection and Analysis, U.S. Department of Transportation. ✎ This project was in collaboration with BlueHalo.
  - Project: An Artificial Intelligence (AI) Traffic Data Analysis Tool for Advanced Freeway Traffic Management, U.S. Department of Transportation. ✎ This project was in collaboration with BlueHalo.
- Research Assistant - Delaware Center for Transportation 11/2016 - 4/2018
  - Project: Snow Plow Route Optimization in Delaware, Delaware Department of Transportation.

Chongqing University Chongqing, China

- Undergraduate Student Researcher 10/2013 - 10/2014
  - Project: Intelligent Environmental Data Collection based on Parrot AR.Drone, Chongqing University Student Research and Training Program (SRTP).

TEACHING EXPERIENCE

University of Delaware Newark, DE, USA

- Guest Lecturer
  - CIEG646: Convex Optimization Fall 2020
  - CISC859: Distributed Ledger Technology (Blockchain) Fall 2019
  - CIEG667: Convex Optimization Fall 2019
- Teaching Assistant
  - CIEG451: Transportation Engineering Laboratory Spring 2020
  - CIEG667: Convex Optimization Fall 2019
- Undergraduate Student Research Mentoring Spring 2020
- Junior Graduate Student Research Mentoring Fall 2020 - Fall 2021

HONORS & AWARDS

- COE Award Nominee for Graduate Student Excellence in Research, College of Engineering, University of Delaware, May 2021.
- Professional Development Award for Graduate Students, Office of Graduate and Professional Education, University of Delaware, February 2019.
- Outstanding Undergraduate Leadership Award, Chongqing University, June 2015.
- Yangtze Power Scholarship for Academic Excellence, China Yangtze Power, April 2014.

PROFESSIONAL DEVELOPMENT TRAINING

- Involvement in grant proposal writing for National Science Foundation and Federal Highway Administration.
- Evidence-based Tips for High Quality and Inclusive Teaching, College of Engineering, University of Delaware, February 2021.
- International Teaching Assistant Training Program, English Language Institute, University of Delaware, Winter 2019.
- Fundamentals of Peer Review, Elsevier Researcher Academy, September 2019.
- Fundamentals of Manuscript Preparation, Elsevier Researcher Academy, February 2019.

SERVICES TO PROFESSION

- Journal Reviewer:
  - IEEE Transactions on Intelligent Transportation Systems
  - IEEE Access
  - IEEE Internet of Things Journal
  - Information Processing & Management
- Conference Reviewer:
  - IEEE International Conference on Blockchain
  - International Congress on Blockchain and Applications