

# WANXIN LI

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## EDUCATION

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### University of Delaware

Newark, DE, USA

- Ph.D. in Transportation Engineering  
– Advisor: Prof. Mark Nejad

9/2018 - 5/2022 (expected)

- M.S. in Computer Science

9/2015 - 5/2017

### Chongqing University

Chongqing, China

- B.S. in Computer Science

9/2011 - 6/2015

## RESEARCH INTERESTS

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

## PUBLICATIONS (citations: 112, h-index: 5)

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

- J1. An Attribute-based Cryptosystem for Electronic Health Records Management with A Hybrid Blockchain-Edge Architecture  
H. Guo, **W. Li\***, M. Nejad and C. Shen  
*IEEE Transactions on Network and Service Management*. (impact factor: 4.2) - under review
- J2. 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 Science and Engineering*. (impact factor: 5.2) - under review
- J3. 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
- J4. 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
- J5. 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](https://doi.org/10.1109/ACCESS.2020.3029512)
- J6. 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](https://doi.org/10.1109/ACCESS.2020.3028189)

## Peer-reviewed Conference Papers

- C1. BFRT: Blockchain 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. - under review*
- 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. - in press*
- 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. - in press*
- 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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 Science and Engineering. (impact factor: 5.2)*

- M2. Aggregated Zero-knowledge Proof and Blockchain-Empowered Authentication for Autonomous Truck Platooning  
**W. Li**, C. Meese, M. Nejad and H. Guo  
*IEEE Transactions on Intelligent Transportation Systems. (impact factor: 6.5)*

## PRESENTATIONS & POSTERS

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- 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

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### 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 Intelligent Automation Inc., Jacobs Engineering Group Inc. 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 Intelligent Automation Inc.
- 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 Intelligent Automation Inc.
- 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
- 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 Co., Ltd., 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**

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- 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