

# WANXIN LI

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## EDUCATION

<b>University of Delaware</b>	Newark, DE, USA
<ul style="list-style-type: none"> <li>• Ph.D. in Transportation Engineering 9/2018 - 5/2022               <ul style="list-style-type: none"> <li>– Dissertation: Frontiers in Blockchain for Secure Information Sharing in Next Generation Transportation Systems</li> <li>– Advisor: Dr. Mark Nejad</li> <li>– GPA: 4.0</li> </ul> </li> <li>• M.S. in Computer Science 9/2015 - 5/2017</li> </ul>	
<b>Chongqing University</b>	Chongqing, China
<ul style="list-style-type: none"> <li>• B.S. in Computer Science 9/2011 - 6/2015</li> </ul>	

## RESEARCH INTERESTS

Security and privacy in blockchain, and blockchain-inspired applications such as connected and autonomous vehicular networks, electronic health records and federated learning.

## PUBLICATIONS (citations: 176, 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](https://doi.org/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](https://doi.org/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.  
DOI: [10.1109/HotICN53262.2021.9680858](https://doi.org/10.1109/HotICN53262.2021.9680858)
- 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](https://doi.org/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](https://doi.org/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](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 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

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P1. Frontiers in Blockchain for Secure Information Sharing in Next Generation Transportation Systems

*Department of Civil and Environmental Engineering, University of Delaware, Newark, DE, USA, March 23, 2022.*

P2. 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.*

P3. Blockchain-enhanced Traffic Management Approach

*Department of Civil and Environmental Engineering, University of Delaware, Newark, DE, USA, Fall 2021.*

P4. 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.*

P5. 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.*

P6. 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.*

P7. 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.*

P8. Blockchain: From Digital Currencies to Industrial Innovations




*Shandong Agricultural University, Tai'an, China, December 30, 2019.*

P9. A Blockchain-based Architecture for Traffic Signal Control System

*Department of Civil and Environmental Engineering, University of Delaware, Newark, DE, USA, October 30, 2019.*

- P10. Introduction to Hyperledger Fabric  
*Department of Computer and Information Sciences, University of Delaware, Newark, DE, USA, October 18, 2019.*
- P11. A Blockchain-based Architecture for Traffic Signal Control Systems  
*IEEE International Congress on Internet of Things (ICIOT), Milano, Italy, July 9, 2019.*
- P12. 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.*
- P13. 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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|---|------------------|
| <b>University of Delaware</b>   | Newark, DE, USA  |
| <ul style="list-style-type: none"> <li>• Research Assistant - Mobility of the Future Lab <span style="float: right;">9/2018 - Present</span> <ul style="list-style-type: none"> <li>– 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.</li> <li>– 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.</li> <li>– 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.</li> </ul> </li> <li>• Research Assistant - Delaware Center for Transportation <span style="float: right;">11/2016 - 4/2018</span> <ul style="list-style-type: none"> <li>– Project: Snow Plow Route Optimization in Delaware, Delaware Department of Transportation.</li> </ul> </li> </ul> |                  |
| <b>Chongqing University</b>   | Chongqing, China |
| <ul style="list-style-type: none"> <li>• Undergraduate Student Researcher <span style="float: right;">10/2013 - 10/2014</span> <ul style="list-style-type: none"> <li>– Project: Intelligent Environmental Data Collection based on Parrot AR.Drone, Chongqing University Student Research and Training Program (SRTP).</li> </ul> </li> </ul>  |                  |

## TEACHING EXPERIENCE

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| <b>University of Delaware</b>  | Newark, DE, USA |
| <ul style="list-style-type: none"> <li>• Guest Lecturer <ul style="list-style-type: none"> <li>– CIEG646: Convex Optimization <span style="float: right;">Fall 2020</span></li> <li>– CISC859: Distributed Ledger Technology (Blockchain) <span style="float: right;">Fall 2019</span></li> <li>– CIEG667: Convex Optimization <span style="float: right;">Fall 2019</span></li> </ul> </li> <li>• Teaching Assistant <ul style="list-style-type: none"> <li>– CIEG451: Transportation Engineering Laboratory <span style="float: right;">Spring 2020</span></li> <li>– CIEG667: Convex Optimization <span style="float: right;">Fall 2019</span></li> </ul> </li> </ul> |                 |

- Junior Graduate Student Research Mentoring
- Undergraduate Student Research Mentoring

Fall 2020 - Fall 2021

Spring 2020

## **HONORS & AWARDS**

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- Graduate Research Award (one recipient per year), Department of Civil and Environmental Engineering, University of Delaware, May 2022.
- 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**

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