

# CHIA-CHENG (JERRY) YEN

418 Russell Park Apt1, Davis CA, 95616, USA

☎ (530)-761-6752 | ✉ [ccyen@ucdavis.edu](mailto:ccyen@ucdavis.edu) | [in jerry-yen](https://www.linkedin.com/in/jerry-yen) | [g cceyen](https://www.google.com/cceyen) | 🏠 [colouryen](https://colouryen.com)

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## RESEARCH INTERESTS

- Deep Reinforcement Learning, Traffic Signal Control, Cyber-security, WSNs

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## EDUCATION

### PhD Candidate in Computer Science

University of California, Davis

Current GPA: 3.9/4.0

Expected 06/2021

### Master of Science in Computer Science

National Tsing Hua University, Hsinchu, Taiwan

Overall GPA: 4.27/4.3 (50% Academic Average and 50% Thesis)

07/2014

### Bachelor of Science in Computer Science and Information Engineering

Fu Jen Catholic University, Taipei, Taiwan

Overall GPA: 3.96/4.0 (Major GPA: 4.0/4.0)

Best Ranked 1<sup>st</sup>, Average Ranked 2<sup>nd</sup> in class

06/2012

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## RESEARCH EXPERIENCES

### Network and Architecture Lab (Advisor: Professor Dipak Ghosal)

University of California, Davis

09/2017-present

- Security vulnerability on backpressure-based TSC schemes [1][6]  
Discover potential threats to modern TSC systems  
Avoid 100% of security attacks using the proposed algorithms
- Deep reinforcement learning (DRL) for multi-intersection control [5]  
Increase learning ability of DRL-agents with learnable image features  
Enhance performance of DRL-agents using a proposed reward function  
Achieve 3x speed-up during training using the proposed 2DSARSA

### Visual Communication Lab (Advisor: Professor Jia-Shung Wang)

National Tsing Hua University, Hsinchu, Taiwan

09/2012-07/2014

- Delivery of videos distributed over ultra-dense networks (UDN) [7][9]  
Deployed distributed storage using LT codes for popular videos  
Evaluated distributed delivery for hot videos over UDN
- Interpolation-based clustering algorithm for gene expression data [4]  
Proposed an unsupervised framework for classifying time-series data  
Achieved higher classification accuracy than other methods
- Data compression in WSNs [2][8]  
Proposed tree-structured linear approximation for compression data  
Compressed data based on available transmission rate without high distortion  
Achieved better performance in compression for heterogeneous sensor data

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## PUBLICATIONS

### Journal Papers

- [1] Chia-Cheng Yen, Dipak Ghosal, Michael Zhang, and Chen-Nee Chuah, "Security Vulnerabilities and Protection Mechanisms for Backpressure-based Traffic Signal Control," *IEEE Transactions on Intelligent Transportation Systems*, 2019, **Under Review**.
- [2] Chia-Cheng Yen, Chu-Ming Wang, Wan-Yane Yang, and Jia-Shung Wang, "Homogeneous and Heterogeneous IoT Data Compression using Tree-Structured Linear Approximation Approach," *ACM Transaction on Sensor Network*, 2019, **Under Review**.
- [3] Yu-Tai Lin, Chia-Cheng Yen, and Jia-Shung Wang, "Video Recommendation and Popularity Prediction: An Auto-encoder Approach with Clustering," *ACM Transaction on Information Systems*, 2019, **Under Review**.
- [4] Tai-Yu Chiu, Ting-Chieh Hsu, Chia-Cheng Yen, and Jia-Shung Wang, "Interpolation based consensus clustering for gene expression time series," *BMC Bioinformatics*.2015;16:117.

### Conference Papers

- [5] Chia-Cheng Yen, Dipak Ghosal, Michael Zhang, and Chen-Nee Chuah, "A Deep On-policy Learning Traffic Signal Control Using Traffic Flow Maps for Multiple Intersections," *IEEE 23<sup>rd</sup> International Conference on Intelligent Transportation Systems*, Sep. 2020.
- [6] Chia-Cheng Yen, Dipak Ghosal, Michael Zhang, Chen-Nee Chuah, and Hao Chen, "Falsified Data Attack on Backpressure-based Traffic Signal Control Algorithms," *IEEE Vehicular Networking Conference*, Dec. 2018.

- [7] Yi-Ting Chen, **Chia-Cheng Yen**, Yu-Tai Lin, and Jia-Shung Wang, "Cooperative Caching Plan of Popular Videos for Mobile Users by Grouping Preference," *IEEE 16<sup>th</sup> International Conference on Pervasive Intelligence and Computing (PiCom)*, Aug. 2018.
- [8] Chu-Ming Wang, **Chia-Cheng Yen**, Wan-Yane Yang, and Jia-Shung Wang, "Tree-Structure Linear Approximation for Data Compression over WSNs," *IEEE 12<sup>th</sup> International Conference on Distributed Computing in Sensor Systems (DCOSS)*, May 2016.
- [9] **Chia-Cheng Yen** and Jia-Shung Wang, "Distributed Delivery of Popular Videos over Ultra-Dense Networks," *IEEE Symposium on Computers and Communication (ISCC)*, Jul. 2015.
- [10] Hsien-Tzu Chiu, **Chia-Cheng Yen**, and Jia-Shung Wang, "A Framework of Temporal Data Retrieval for Unreliable WSNs Using Distributed Fountain Codes," *IEEE 9<sup>th</sup> International Conference on Mobile Ad-hoc and Sensor Networks (MSN)*, Dec. 2013.

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## WORK & TEACHING EXPERIENCES

<b>Teaching Assistant, Department of Computer Science</b> <b>University of California, Davis, CA, USA</b>	<b>03/2018-present</b>
<ul style="list-style-type: none"> <li>ECS 10, ECS 50, ECS 122A, ECS 154A</li> <li>Hold office hours, lead discussions, and grade assignments for undergraduate students</li> </ul>	
<b>Graduate Student Researcher, Network and Architecture Lab</b> <b>University of California, Davis, CA, USA</b>	<b>09/2017-present</b>
<ul style="list-style-type: none"> <li>Research topics including Reinforcement Learning, Traffic Signal Control, and Security</li> </ul>	
<b>Research Assistant, Advanced Network Technologies and Services Lab</b> <b>Institute of Information Science, Academia Sinica, Taiwan</b>	<b>04/2017-08/2017</b>
<ul style="list-style-type: none"> <li>Research topics including Wireless Networks and Machine Learning</li> </ul>	
<b>Research Assistant, Visual Communication Lab</b> <b>National Tsing Hua University, Hsinchu, Taiwan</b>	<b>09/2012-07/2014</b>
<ul style="list-style-type: none"> <li>Research topics including Networks, Clustering, Stereo Matching, and Data Compression</li> </ul>	

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## AWARDS

<b>NSF Travel Grant Award, 2018 VNC</b>	<b>12/2018</b>
<b>Academic Excellence Award, FJU</b>	<b>09/2008-06/2012</b>
<b>Second Best Project Award, FJU</b>	<b>11/2011</b>

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## SELECTED TERM PROJECTS

<b>Online Ticketing System, Department of Computer Science and Information Engineering, FJCU</b>
<ul style="list-style-type: none"> <li>Utilized Oracle to build up an online ticketing system for railway</li> <li>Supported multiple users for simultaneous booking</li> </ul>
<b>Multimedia Sharing System, Department of Computer Science and Information Engineering, FJCU</b>
<ul style="list-style-type: none"> <li>Shared movies or music with friends through MSN</li> <li>Utilized peer-to-peer communication and adjusted transmission rate dynamically</li> <li>Applied distributed streaming mechanism and circular buffer technique</li> </ul>
<b>Stereo Matching, Visual Communication Lab</b>
<ul style="list-style-type: none"> <li>Implemented Horizontal and Vertical Consideration on Cost Initialization as well as Domain Transform on Cost Aggregation</li> <li>Improved disparity estimation method</li> </ul>

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## PROGRAMMING LANGUAGES

- Proficient with:** C/C++, Python, Java, Matlab
- Familiar with:** HTML, Assembly