

# CHIA-CHENG (JERRY) YEN

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## RESEARCH INTERESTS

- Reinforcement Learning, Traffic Networks, Cyber-security, WSNs

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## EDUCATION

**PhD candidate in Computer Science**  
**University of California, Davis**

09/2017-present

- Current GPA: 3.88/4.0

**Master of Science in Computer Science**

09/2012-07/2014

**National Tsing Hua University, Hsinchu, Taiwan**

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

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

09/2008-06/2012

**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

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## RESEARCH EXPERIENCES

**Network and Architecture Lab** (Advisor: Professor Dipak Ghosal)  
**University of California, Davis**

09/2017-present

- Backpressure-based Schemes for Maximizing Throughput at Multiple Intersections [1][6]
  - Apply the network model to schedule traffic signal controls for multiple intersections
  - Security analysis on Backpressure-based schemes
- Delay-based Deep Reinforcement Learning for Multiple Intersections [5]
  - Propose a two-level architecture for scheduling traffic movements in multiple intersections
  - Propose traffic flow maps (TFMs) to dynamically model states of the traffic network
  - Apply SARSA, SARSA  $\lambda$ , and Q-learning with deep neural networks to traffic control problems

**Visual Communication Lab** (Advisor: Professor Jia-Shung Wang)  
**National Tsing Hua University, Hsinchu, Taiwan**

09/2012-07/2014

- Distributed Delivery of Videos over Ultra-dense Networks [7][9]
  - Deploy distributed storage using LT codes on cloud platform for popular videos
  - Evaluate distributed delivery techniques for hot videos over ultra-dense wireless environments
- Clustering Algorithm for Gene Expression Data [4]
  - Affinity propagation-based clustering algorithm for time-series gene expression data
  - Outperform other methods when the same datasets were used in the evaluation
- Data Compression in WSNs [2][8]
  - Tree-structured linear approximation with optimal RD control method for IoT Data
  - Considering the heterogeneity of sensors simultaneously using the R-D distortion allocation

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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, **In Progress**.
- [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

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|---|------------------------|
| <b>Teaching Assistant, Department of Computer Science</b><br><b>University of California, Davis, CA, USA</b> <ul style="list-style-type: none"> <li>ECS 10, ECS 50, ECS 154A, ECS 122A</li> <li>Led discussion classes and assisted students with programming and examining</li> </ul>  | <b>03/2018-present</b> |
| <b>Graduate Student Researcher, Network and Architecture Lab</b><br><b>University of California, Davis, CA, USA</b> <ul style="list-style-type: none"> <li>Research topics including Reinforcement Learning, Traffic Signal Control, and Security</li> </ul>  | <b>09/2017-present</b> |
| <b>Research Assistant, Advanced Network Technologies and Services Lab</b><br><b>Institute of Information Science, Academia Sinica, Taiwan</b> <ul style="list-style-type: none"> <li>Research topics including Wireless Networks and Machine Learning</li> </ul>  | <b>04/2017-08/2017</b> |
| <b>Research Assistant, Visual Communication Lab</b><br><b>National Tsing Hua University, Hsinchu, Taiwan</b> <ul style="list-style-type: none"> <li>Research topics including Networks, Clustering, Stereo Matching, and Data Compression</li> <li>Attended IEEE 9<sup>th</sup> International Conference on Mobile Ad-hoc and Sensor Networks, International Workshop on Software Defined Sensor Networks, Dalian, China, December 11-13, 2013</li> </ul> | <b>09/2012-07/2014</b> |

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## AWARDS

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| <b>NSF Travel Grant Award</b> <ul style="list-style-type: none"> <li>Awarded to students whose research paper is accepted by VNC [3]</li> <li>Selection is based on student merit qualifications and financial need</li> </ul>  | <b>12/2018</b>         |
| <b>Academic Excellence Award (7 times)</b> <ul style="list-style-type: none"> <li>Awarded to students with top 5% GPA for that semester</li> <li>Provided scholarships to students with top 5% GPA for that semester</li> </ul> | <b>09/2008-06/2012</b> |
| <b>Second Best Project Award, Department of Computer Science and Information Engineering, FJCU</b> <ul style="list-style-type: none"> <li>Ranked 2<sup>nd</sup> out of 27 teams</li> </ul>                                      | <b>11/2011</b>         |

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## SELECTED TERM PROJECTS

- Online Ticketing System, Department of Computer Science and Information Engineering, FJCU**
  - Utilized Oracle to build up an online ticketing system for railway
  - Supported multiple users for simultaneous booking
- Multimedia Sharing System, Department of Computer Science and Information Engineering, FJCU**
  - Shared movies or music with friends through MSN
  - Utilized peer-to-peer communication and adjusted transmission rate dynamically
  - Applied distributed streaming mechanism and circular buffer technique
  - Awarded second place prize
- Stereo Matching, Visual Communication Lab**
  - Implemented Horizontal and Vertical Consideration on Cost Initialization
  - Implemented Domain Transform on Cost Aggregation
  - Improved disparity estimation method

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## PROGRAMMING LANGUAGES

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