CHIA-CHENG (JERRY) YEN

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RESEARCH INTERESTS

- Deep Reinforcement Learning (DRL), Traffic Signal Control (TSC), Cyber-security, WSNs

EDUCATION

PhD Candidate in Computer Science **Expected 06/2021**
University of California, Davis
Current GPA: 3.9/4.0

Master of Science in Computer Science **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 **06/2012**
Fu Jen Catholic University, Taipei, Taiwan
Overall GPA: 3.96/4.0 (Major GPA: 4.0/4.0)
Best Ranked 1st, Average Ranked 2nd in class

RESEARCH EXPERIENCES

Network and Architecture Lab (Advisor: Professor Dipak Ghosal) **09/2017-present**
University of California, Davis

- AI enabled fuel-aware optimization for multi-model autonomous vehicles
  Train a platooning model by DRL for reducing fuel consumption
- Cyber-attacks to delay packets in 5G Networks
  Analyze the impact of ghost bearers on normal UEs
- Security vulnerability on backpressure-based TSC schemes [1][6]
  Analyze the impact of misinformation on modern TSC systems
  Avoid misinformation attacks using the proposed algorithms
- DRL-based TSC for multi-intersection control [5]
  Increase learning ability of DRL-agents with learnable image features
  Enhance performance of DRL-agents using a novel reward function
  Achieve *3x* speed-up during training using the proposed 2DSARSA
- Two-level TSC architecture for multi-intersection control
  Propose a traffic light control system with a higher layer and lower layer
  DRL model at the higher layer controls TSC controllers by weights based on flow dynamics

Visual Communication Lab (Advisor: Professor Jia-Shung Wang) **09/2012-07/2014**
National Tsing Hua University, Hsinchu, Taiwan

- Delivery of videos distributed over ultra-dense networks (UDN) [7][9]
  Deployed distributed storage using LT codes for popular videos
  Evaluated distributed delivery for popular 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]
  Compressed data based on available transmission rate without high distortion
  Achieved better performance in compression for heterogeneous sensor data

PUBLICATIONS

Journal Papers

[1] **Chia-Cheng Yen**, Dipak Ghosal, Michael Zhang, and Chen-Nee Chuah, "Security Vulnerabilities and Protection Algorithms for Backpressure-based Traffic Signal Control," *IEEE Transactions on Intelligent Transportation Systems*, 2020, **Accepted**.

[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*, 2020, **Under Review**.

[3] Yu-Tai Lin, **Chia-Cheng Yen**, and Jia-Shung Wang, "Video Popularity Prediction: An Autoencoder Approach with Clustering," *IEEE Access*, vol. 8, pp. 129285-129299, 2020.

[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 23rd International Conference on Intelligent Transportation Systems*, Sep. 2020. **Nominated for the best student paper award**.

[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 16th 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 12th 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 9th International Conference on Mobile Ad-hoc and Sensor Networks (MSN)*, Dec. 2013.

WORK & TEACHING EXPERIENCES

Teaching Assistant, *Department of Computer Science* **03/2018-present**
University of California, Davis, CA, USA
- ECS 10, ECS 36B, ECS 50, ECS 122A, ECS 154A
- Hold office hours, lead discussions, and grade assignments for undergraduate students

Graduate Student Researcher, *Network and Architecture Lab* **09/2017-present**
University of California, Davis, CA, USA
- Research topics including Reinforcement Learning, Traffic Signal Control, and Security

Research Assistant, *Advanced Network Technologies and Services Lab* **04/2017-08/2017**
Institute of Information Science, Academia Sinica, Taiwan
- Research topics including Wireless Networks and Machine Learning

Research Assistant, *Visual Communication Lab* **09/2012-07/2014**
National Tsing Hua University, Hsinchu, Taiwan
- Research topics including Networks, Clustering, Stereo Matching, and Data Compression

AWARDS

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

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

Stereo Matching, *Visual Communication Lab*
- Implemented Horizontal and Vertical Consideration on Cost Initialization as well as Domain Transform on Cost Aggregation
- Improved disparity estimation method

PROGRAMMING LANGUAGES

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