Yuan-Hung Kuan

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Education

PhD in Washington University in St. Louis *Sep. 2020 - present*
- *Electrical and Systems Engineering (ESE)*

BS in National Taiwan University *Sep. 2015 - Jun. 2019*
- *Major in Department of Bioenvironmental Systems Engineering (BSE)*
- *Minor in Department of Mathematics (MATH)*

Experience

Graduate Research Assistance *St. Louis, MO*
Washington University in St. Louis *Sep 2020 - present*

Undergraduate Summer Research Internship *St. Louis, MO*
Washington University in St. Louis *Jul 2019 - Sep 2019*
- Complete an undergraduate summer research internship in the department of electrical and systems engineering under the guidance of professor Jr-Shin Li.

Research Assistance *Taipei, Taiwan*
National Taiwan University *Apr 2020 - Jun 2020*

Presentations

Oral Presentation *Milan; Dec 16-19, 2024*
- presenting in *IEEE Conference on Decision and Control (CDC) conference.*
- presenting 1 paper [C1] in a meeting.

Student Award Finalist (Oral Presentation) / Poster Presentation *Boston; Oct 27-30, 2024*
- presenting in *The 46th Society for Medical Decision Making (SMDM) Annual North American Meeting.*
- attending the Lusted Student Award competition [C6] and presenting 1 poster [C8].

Oral Presentation / Invite Panel Presentation *Singapore; Dec 12-15, 2023*
- presenting in *IEEE Conference on Decision and Control (CDC) conference.*
- presenting 1 paper [C2] in a meeting and 1 research topic in a workshop panel.

Panel Discussion *Taipei; Dec 31, 2024*
- presenting 1 research topic in a panel discussion.

Awards

Lee B. Lusted Student Award Finalist *2024*
- in *The 46th Society for Medical Decision Making Annual North American Meeting (SMDM)*

The McKelvey Engineering Professional Development Award *2024*
The Outstanding Graduate Student Assistant to the Instructor Award *2023*
The McKelvey Engineering Professional Development Award *2023*
McDonnell International Scholars Academy *2020*
Dean's Select PhD Scholar *2020*
Taiwan Ministry of Education Fellow *2020*

Publications

Journal:

(J1.) **Yuan-Hung Kuan**, Vignesh Narayanan, Jr-Shin Li, *Iterative Reservoir Computing Networks for Reconstructing Irregular Time-Series Data,* in IEEE Transactions on Neural Networks and Learning Systems (TNNLS), 10.1109/TNNLS.2025.3547965

(J2.) Jr-Shin Li, **Yuan-Hung Kuan**, Wei Zhang, *Optimal Quantum Control using Ensemble Quantization,* SIAM Journal on Control and Optimization, 10.1137/23M1590809

(J3.) Jr-Shin Li, Wei Zhang, **Yuan-Hung Kuan**, *Moment quantization of inhomogeneous spin ensembles,* Annual Review in Controls (ARC), Vol. 54, pp. 305-313, 2022, 10.1016/j.arcontrol.2022.07.006

Conference / Meeting:

(C1.) **Yuan-Hung Kuan**, Wei Zhang, Jr-Shin Li, *Computational Moment Control of Ensemble Systems,* 2024 63nd IEEE Conference on Decision and Control (CDC), Milan, Italy, 2024, pp. 1251-1256, 10.1109/CDC56724.2024.10886536

(C2.) **Yuan-Hung Kuan**, Xin Ning, Jr-Shin Li, *A Generalized-Moment Method for Control-Affine Ensemble Systems,* 2023 62nd IEEE Conference on Decision and Control (CDC), Singapore, Singapore, 2023, pp. 1654-1659, 10.1109/CDC49753.2023.10383974

(C3.) Mei Wang, **Yuan-Hung Kuan**, Patrick Alba, Qiwei Gan, Martin Schoen, Theodore Thomas, Jr-Shin Li, Su-Hsin Chang, *Developing Large Language Model-based Pipeline for Identification of Disease Diagnosis: A Case Study on Identifying Newly Diagnosed Multiple Myeloma in Veterans Health Administration Electronic Health Records,* The American Medical Informatics Association (AMIA) 2025 Annual Symposium.

(C4.) Mei Wang, **Yuan-Hung Kuan**, Jr-Shin Li, Su-Hsin Chang, *Leveraging natural language processing to identify smoldering multiple myeloma from electronic health record data,* The 47th Society for Medical Decision Making (SMDM) Annual North American Meeting, Michigan, 2024.

(C5.) Wei Zhang, **Yuan-Hung Kuan**, Su-Hsin Chang, Jr-Shin Li, *A Deep Reservoir Computing Architecture for Dynamic Generative Modeling*, International Joint Conference on Neural Networks (IJCNN), Rome, 2025.

(C6.) **Yuan-Hung Kuan**, Mei Wang, Jr-Shin Li, Su-Hsin Chang, *A novel deep reservoir computing method to impute electrocardiography for risk prediction models assisting medical decision making,* The 46th Society for Medical Decision Making (SMDM) Annual North American Meeting, Boston, 2024 (Oral Presentation; Lee B. Lusted Student Award Finalist).

(C7.) Mei Wang, **Yuan-Hung Kuan**, Jr-Shin Li, Su-Hsin Chang, *Identifying dynamic markers for multiple myeloma in patients with diabetes mellitus and monoclonal gammopathy of undetermined significance,* The 46th Society for Medical Decision Making (SMDM) Annual North American Meeting, Boston, 2024.

(C8.) **Yuan-Hung Kuan**, Mei Wang, Jr-Shin Li, Su-Hsin Chang, *Using deep neural networks to process incomplete time-varying Intensive Care Unit data for in-hospital mortality prediction,* The 46th Society for Medical Decision Making (SMDM) Annual North American Meeting, Boston, 2024 (Poster Presentation).

Publications (working/submitted paper)

1. **Yuan-Hung Kuan**, Jr-Shin Li, *Global/Local Exact Bilinearization for Nonlinear Systems on Smooth Manifolds,* preparing for submission to IEEE Transactions on Automatic Control (TAC).
2. **Yuan-Hung Kuan**, Jr-Shin Li, *EBIF: Exact Bilinearization Iterative Form for Control-Affine Nonlinear Systems,* preparing for submission to IEEE Transactions on Automatic Control (TAC).
3. Haoyu Quan, Wei Zhang, **Yuan-Hung Kuan**, Jr-Shin Li, *Pattern Control in Robot Swarms through Dynamic Reduction,* under review at The IEEE Transactions on Robotics (T-RO)

Teaching Experience

Graduate Teaching Assistant (TA) *2021-2024*

- TA for courses, including *Linear Dynamic Systems* (ESE 551), *Optimization* (ESE 415), *Advanced Systems Science for Learning and Control of Complex Dynamic Systems* (ESE 5581)

Technical Skills

Skills: Machine Learning, Deep Learning, Numerical Method, Time Series Analysis
Programming Languages: MATLAB, Python, LaTeX, R
Technologies/Frameworks: PyTorch, Matplotlib, Keras, Pandas, Scikit-learn, NumPy

Languages: Fluent - English and Native - Chinese

Professional Activities and Academic Services

Professional societies: Institute of Electrical and Electronics Engineers (Student member)
Manuscript Peer Review: Scientific Reports, International Conference on Learning Representations (ICLR), IEEE Conference on Decision and Control (CDC)

Other Experience

PhD-in-3D Competition *St. Louis, MO*
Washington University in St. Louis *Mar. 2024*

Undergraduate Summer Research Internship Student Leader *St. Louis, MO*
Washington University in St. Louis *Jun. 2024 - Aug. 2024*

Undergraduate Summer Research Internship Student Leader *St. Louis, MO*
Washington University in St. Louis *Jun. 2023 - Aug. 2023*