JUN CHEN, PH.D., ASSISTANT PROFESSOR

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CONTACT

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EDUCATION

Ph.D. in Electrical Engineering (minor in CS), Iowa State University, Ames IA, 4.0/4.0 — 12/2014
B. S. in Automation, Zhejiang University, Hangzhou China — 06/2009

RESEARCH INTERESTS

Systems and Control: Model predictive control, optimal control, stochastic processes, event-triggered control
Artificial Intelligence: Reinforcement learning, deep learning, time series, generative adversary network
Intelligent Vehicles: Autonomous vehicle, electric vehicle, battery control, vehicle dynamics, co-simulation
Power & Energy: Hybrid energy systems, renewable energy, power electronics, battery, economic analysis
Discrete Event and Hybrid Systems: failure diagnosis and prognosis, resiliency, privacy, verification

EMPLOYMENT

Assistant Professor, ECE Deptartment, Oakland University, Rochester MI, USA — 08/2020–present
Senior Control Systems Engineer, General Motors, Milford MI, USA — 01/2017–08/2020
R&D Scientist in *Power and Energy Systems*, Idaho National Laboratory, ID, USA — 11/2014–12/2016
Summer Intern in *Software V&V*, General Motors R&D, MI, USA — 04/2014–07/2014
Research Assistant in *Stochastic Hybrid Systems*, Iowa State University, IA, USA — 01/2011–10/2014
Teaching Assistant in *Electrical Engineering*, Iowa State University, IA, USA — 01/2011–12/2013
Research Assistant in *System Identification*, University of Central Florida, FL, USA — 08/2009–12/2010

HONORS AND RECOGNITIONS

NSF CAREER Award, National Science Foundation — 2022
IEEE Best Paper Award, IEEE Transactions on Automation Science and Engineering — 2016
Best Paper Award, IEEE International Conference on Electro-Information Technology — 2023
Most Active Grant Seeker Award, Oakland University — 2023
Faculty Recognition Award for Research, Oakland University — 2023
Associate Editor, IEEE International Conference on Robotics and Automation — 2020
IEEE Senior Member — 2020
Associate Editor, IEEE Conference on Control Technology and Applications — 2023–present
Associate Editor, IET Cyber-Systems and Robotics — 2022–present
Associate Editor, IFAC International Symposium on Advances in Automotive Control — 2022
Undergraduate Research Competition Winner (my advisee), ASME ICE Division — 2022
INL Publication Achievement Award, Idaho National Laboratory — 2016
Research Excellence Award, Iowa State University — 2014
Student Travel Award, American Control Conference — 2014
Provost Graduate Fellowship, University of Central Florida — 2009–2010
Third Class Scholarship for Undergraduate Student, Zhejiang University — 2008
Outstanding Student, Zhejiang University — 2008

SELECTED GRANTS

Total ∼$795k

[4] **Jun Chen**, $40,000, "Sensor Reduction for Battery Cell State-of-Charge Estimation," 01/2024–12/2024, MEDC ADVANCE Proof-of-Concept Fund.

[3] **Jun Chen**, $500,000, "CAREER: Reconfigurable and Predictive Control with Reinforcement Learning Supervisor for Active Battery Cell Balancing," 01/2023–12/2027, NSF-ECCS-EPCN.

[2] Yang Chen, **Jun Chen** and Om Prakash Yadav, $75,000, "Ocean Energy Supported Multi-Energy System Planning and Operation Optimization for Sustainable Coastal Community," 07/2023–06/2024, Coastal Studies Institute, North Carolina Renewable Ocean Energy Program.

[1] **Jun Chen**, $10,000, "Impacts of Battery Cell Imbalance and Mitigation by AI and Controls," 05/2022–05/2023, Michigan Space Grant Consortium.

SELECTED PUBLICATIONS

(Students under my close supervision are marked in underline; corresponding author is marked by *)

Selected Journal Articles (34 published/accepted; 10 under review)

[15] Fengying Dang, Dong Chen, **Jun Chen*** and Zhaojian Li*, "Event-Triggered Model Predictive Control with Deep Reinforcement Learning for Autonomous Driving," *IEEE Transactions on Intelligent Vehicles*, (Accepted for Publication October 2023).

[14] **Jun Chen***, Aman Behal, Zhaojian Li and Chong Li, "Active Battery Cell Balancing by Real Time Model Predictive Control for Extending Electric Vehicle Driving Range," *IEEE Transactions on Automation Science and Engineering*, (Accepted for Publication June 2023).

[13] Mohammad R. Hajidavalloo, **Jun Chen***, Qiuhao Hu, Ziyou Song, Xunyuan Yin and Zhaojian Li, "NMPC-based Integrated Thermal Management of Battery and Cabin for Electric Vehicles in Cold Weather Conditions," *IEEE Transactions on Intelligent Vehicles*, volume 8, number 9, pages 4208–4222, September 2023.

[12] Christopher Rother, Zhaodong Zhou and **Jun Chen***, "Development of a Four-Wheel Steering Scale Vehicle for Research and Education on Autonomous Vehicle Motion Control," *IEEE Robotics and Automation Letters*, volume 8, number 8, pages 5015–5022, August 2023.

[11] Zhaodong Zhou, Christopher Rother and **Jun Chen***, "Event-Triggered Model Predictive Control for Autonomous Vehicle Path Tracking: Validation using CARLA Simulator," *IEEE Transactions on Intelligent Vehicles*, volume 8, number 6, pages 3547–3555, June 2023.

[10] Ali Irshayyid and **Jun Chen***, "Comparative Study of Cooperative Platoon Merging Control Based on Reinforcement Learning," *Sensors*, volume 23, number 2-990, pages 1–23, January 2023.

[9] **Jun Chen*** and Ratnesh Kumar, "Stochastic Failure Prognosis of Discrete Event Systems," *IEEE Transactions on Automatic Control*, volume 67, number 10, pages 5487–5492, October 2022.

[8] **Jun Chen**, Christoforos Keroglou, Christoforos N. Hadjicostis and Ratnesh Kumar, "Revised Test for Stochastic Diagnosability of Discrete-Event Systems," *IEEE Transactions on Automation Science and Engineering*, volume 15, number 1, pages 404–408, January 2018.

[7] **Jun Chen** and Cristian Rabiti, "Synthetic Wind Speed Scenarios Generation for Probabilistic Analysis of Hybrid Energy Systems," *Energy*, volume 120, pages 507-517, February 2017.

[6] **Jun Chen**, Mariam Ibrahim and Ratnesh Kumar, "Quantification of Secrecy in Partially Observed Stochastic Discrete Event Systems," *IEEE Transactions on Automation Science and Engineering*, volume 14, number 1, pages 185–195, January 2017.

[5] **Jun Chen** and Humberto E. Garcia, "Economic Optimization of Operations for Hybrid Energy Systems under Variable Markets," *Applied Energy*, volume 177, pages 11–24, September 2016.

[4] **Jun Chen** and Ratnesh Kumar, "Fault Detection of Discrete-Time Stochastic Systems Subject to Temporal Logic Correctness Requirements," *IEEE Transactions on Automation Science and Engineering*, volume 12, number 4, pages 1369–1379, October 2015. (**IEEE Best Paper Award**: link)

[3] **Jun Chen** and Ratnesh Kumar, "Stochastic Failure Prognosability of Discrete Event Systems," *IEEE Transactions on Automatic Control*, volume 60, number 6, pages 1570–1581, June 2015.

[2] **Jun Chen** and Ratnesh Kumar, "Failure Detection Framework for Stochastic Discrete Event Systems with Guaranteed Error Bounds," *IEEE Transactions on Automatic Control*, volume 60, number 6, pages 1542–1553, June 2015.

[1] Lingfei Zhi, **Jun Chen**, Peter Molnar and Aman Behal, "Weighted Least-Squares Approach for Identification of a Reduced-Order Adaptive Neuronal Model," *IEEE Transactions on Neural Networks and Learning Systems*, volume 23, number 5, pages 834–840, May 2012.

Selected Peer Reviewed Conference Articles (29 published/accepted; 3 under review)

[11] Zhaodong Zhou, **Jun Chen***, Mingyuan Tao, Peng Zhang and Meng Xu, "Experimental Validation of Event-Triggered Model Predictive Control for Autonomous Vehicle Path Tracking," *IEEE International Conference on Electro Information Technology*, Romeoville, IL, May 18–20, 2023. (**Best Paper Award**: link)

[10] Steven DeCoste, Antonio Scalzi, **Jun Chen*** and Dan DelVescovo*, "Minimizing Steady-State Testing Time in an Engine Dynamometer Laboratory," *2023 SAE World Congress*, Detroit, MI, April 18–20, 2023.

[9] Ranya Badawi and **Jun Chen***, "Performance Evaluation of Event-Triggered Model Predictive Control for Boost Converter," *2022 IEEE Vehicle Power and Propulsion Conference*, Merced, CA, November 1–4, 2022.

[8] Ranya Badawi and **Jun Chen***, "Enhancing Enumeration-Based Model Predictive Control for DC-DC Boost Converter with Event-Triggered Control," *European Control Conference*, London, UK, July 12–15, 2022.

[7] **Jun Chen***, Xiangyu Meng and Zhaojian Li, "Reinforcement Learning-based Event-Triggered Model Predictive Control for Autonomous Vehicle Path Following," *2022 American Control Conference*, Atlanta, GA, June 8–10, 2022.

[6] Shan Huang and **Jun Chen***, "Event-triggered Model Predictive Control for Autonomous Vehicle with Rear Steering," *2022 SAE World Congress*, Detroit, MI, April 5–7, 2022.

[5] **Jun Chen*** and Zonggen Yi, "Comparison of Event-Triggered Model Predictive Control for Autonomous Vehicle Path Tracking," *2021 IEEE Conference on Control Technology and Applications*, San Diego, CA, August 8–11, 2021. (Invited Paper)

[4] **Jun Chen***, Man Liang and Xu Ma, "Probabilistic Analysis of Electric Vehicle Energy Consumption Using MPC Speed Control and Nonlinear Battery Model," *2021 IEEE Green Technologies Conference*, Denver, CO, April 7–9, 2021.

[3] Aaron S. Epiney, Andrea Alfonsi, Cristian Rabiti and **Jun Chen**, "Economic Assessment of Nuclear Hybrid Energy Systems: Optimization using RAVEN," *2017 ANS Annual Meeting*, San Francisco, CA, June 11–15, 2017.

[2] Mariam Ibrahim, **Jun Chen** and Ratnesh Kumar, "A Resiliency Measure for Electrical Power Systems," *2016 IFAC/IEEE International Workshop on Discrete Event Systems*, Xi'an, China, May 30 – June 1, 2016.

[1] **Jun Chen** and Ratnesh Kumar, "Pattern Mining for Predicting Critical Events from Sequential Event Data Log," *2014 IFAC/IEEE International Workshop on Discrete Event Systems*, Paris-Cachan, France, May 14–16, 2014.