Chen Sun

Assistant Professor · University of Hong Kong

Haking Wong Building, The University of Hong Kong, Pokfulam Road, Hong Kong

c87sun@hku.hk

Work Experience

2025.01 - Current	**Adjunct Assistant Professor**, Mechanical and Mechatronics Engineering department, University of Waterloo
2024.12 - Current	**Representative**, IEEE Intelligent Transportation Systems Society and Future Networks Committee
2024.09 - Current	**Assistant Professor**, Department of Data and Systems Engineering, University of Hong Kong
2022.12 - 2024.09	**Postdoctoral Fellow**, Mechatronic Vehicle Systems Lab, University of Waterloo
2022.01 - 2023.06	**Consultant - Autonomous Driving Stack**, Waytous Inc., (Beijing, China)
2017.05 - 2018.08	**R&D Engineer - System Control**, Robot Control Branch-Xylem Inc. (Mississauga, Canada)

Education

University of Waterloo *Waterloo, ON, Canada*

Ph.D. Mechanical & Mechatronics Engineering *2018.09 - 2022.12*

- Dissertation: "Operational Design Domain Monitoring and Augmentation for Autonomous Driving"
- Advisor: Prof. Amir Khajepour

University of Toronto *Toronto, ON, Canada*

M.A.Sc. Electrical & Computer Engineering *2014.09 - 2017.03*

- Thesis: "Fast FDTD Algorithm based on Model Order Reduction"
- Advisor: Prof. Piero Triverio

University of Electronic Science and Technology of China *Chengdu, Sichuan, China*

B.ENG. System Control *2010.09 - 2014.07*

- Honor's Thesis: "Top tension control of a flexible marine riser by using integral-barrier Lyapunov function"
- Undergrad research advisor: Prof. Shuzhi Sam Ge & Prof. Wei He

Publications

Selected Journal Papers (Corresponding Author *)

Zhang, R., **Sun, C. ***, Ning, M., Valiollahimehrizi, R., Lu, Y., Czarnecki, K., & Khajepour, A. (2025). Quantifying learning algorithm uncertainties in autonomous driving systems: Enhancing safety through Polynomial Chaos Expansion and High Definition maps. Accident Analysis & Prevention, 211, 107903.

Zhang, R., **Sun, C. ***, Valiollahimehrizi, R., Czarnecki, K., & Khajepour, A. (2025). An Uncertainty-Aware, Dual-Tiered Decision-Making Method for Safe Autonomous Driving. IEEE Transactions on Intelligent Transportation Systems.

Lu, Y., Zhen, R., Liu, Y., Zhong, J., **Sun, C.** , Huang, Y., & Khajepour, A. (2025). Practical solution for attenuating industrial heavy vehicle vibration: A new gain-adaptive coordinated suspension control system. Control Engineering Practice, 154, 106125.

Sun, C., Cui, Y., Ning, M., Lu, Y., Cao, D., & Khajepour, A. (2024). Extending Operational Design Domain for Perception Systems Through Robust Learning. IEEE Transactions on Intelligent Vehicles.

Ning, M., Khajepour, A., Hashemi, E., & **Sun. C.** (2024). A Novel Motion Planning for Autonomous Vehicles Using Point Cloud based Potential Field. IEEE Transactions on Vehicular Technology.

Sun, C., Ning, M., Deng, Z., & Khajepour, A. (2024). REAL-SAP: Real-time Evidence Aware Liable Safety Assessment for Perception in Autonomous Driving. IEEE Transactions on Vehicular Technology.

Wang, X., Huang, J., Tian, Y., **Sun, C.**, Yang, L., Lou, S., Lv, C., Sun, C. & Wang, F.Y., 2024. Parallel Driving with Big Models and Foundation Intelligence in Cyber–Physical–Social Spaces. Research. 7, p.0349.

Lu, Y., Huang, Y., **Sun, C.**, Zhong, J., & Khajepour, A. (2024). An interconnected suspension with adjustable roll and pitch stiffness (IS-ARPS) to enhance anti-roll and anti-dive/squat characteristics. Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering.

Wang, H., Shao, W., **Sun, C. ***, Yang, K., Cao, D., & Li, J. (2024). A Survey on an Emerging Safety Challenge for Autonomous Vehicles: Safety of the Intended Functionality. Engineering.

Sun, C., Cui, Y., Đào, N. D., Mehrizi, R. V., Pirani, M., & Khajepour, A. (2023). Medium-Fidelity Evaluation and Modeling for Perception Systems of Intelligent and Connected Vehicles. IEEE Transactions on Intelligent Vehicles.

Sun. C. , Zhang, R., Cui, Y., Deng, Z., Cao, D., & Khajepour, A. (2023). Towards Ensuring Safety for Autonomous Driving Perception: Standardization Progress, Research Advances, and Perspectives. IEEE Transactions on Intelligent Transportation Systems

Cui, Y., Huang, S., Zhong, J., Liu, Z., Wang, Y., **Sun, C. ***, ... & Khajepour, A. (2023). DriveLLM: Charting the path toward full autonomous driving with large language models. IEEE Transactions on Intelligent Vehicles.

Wu, X., Ma, Y., Fu, Q., **Sun, C.**, Zhu, B., & He, W. (2022). Anti-Disturbance Boundary Control for a Wave Equation With Input Disturbance. IEEE Transactions on Systems, Man, and Cybernetics: Systems, 53(4), 2236-2245.

Sun, C., Li, S., Cao, D., Wang, F. Y., & Khajepour, A. (2022). Tabular Learning-Based Traffic Event Prediction for Intelligent Social Transportation System. IEEE Transactions on Computational Social Systems.

Ma, Y., **Sun, C.**, Chen, J., Cao, D., & Xiong, L. (2022). Verification and validation methods for decision-making and planning of automated vehicles: A review. IEEE Transactions on Intelligent Vehicles.

Su, L., **Sun. C. ***, Cao, D., & Khajepour, A. (2022). Efficient driver anomaly detection via conditional temporal proposal and classification network. IEEE Transactions on Computational Social Systems, 10(2), 736-745.

Sun. C. , Deng, Z., Chu, W., Li, S., & Cao, D. (2021). Acclimatizing the operational design domain for autonomous driving systems. IEEE Intelligent Transportation Systems Magazine, 14(2), 10-24.

Sun. C. , Wang, C., Deng, Z., & Cao, D. (2020). Dimensionless model-based system tracking via augmented Kalman filter for multiscale unmanned ground vehicles. IEEE/ASME Transactions on Mechatronics, 26(2), 600-610.

Sun. C. , Vianney, J. M. U., Li, Y., Chen, L., Li, L., Wang, F. Y., ... & Cao, D. (2020). Proximity based automatic data annotation for autonomous driving. IEEE/CAA Journal of Automatica Sinica, 7(2), 395-404.

Conference Papers

Sun. C. , Cui, Y., Lu, Y., Cao, Y., Cao, D., & Khajepour, A. (2023, November). Robust Learning for Autonomous Driving Perception Tasks in Cyber-Physical-Social Systems. In 2023 IEEE 3rd International Conference on Digital Twins and Parallel Intelligence (DTPI) (pp. 1-7). IEEE.

Sun. C. , Cui, Y., Đào, N. D., & Khajepour, A. (2023, August). Delay Mitigation for V2I-based Cooperative Autonomous Driving Applications. In the 28th IAVSD International Symposium on Dynamics of Vehicles on Roads and Tracks (IAVSD)

Sun. C. , Tan, R., Deng, J., Zhou, R., Chen, L., Wang, F. Y., & Cao, D. (2021, July). Accident prediction in mesoscopic view: A cpss-based social transportation approach. In 2021 IEEE 1st International Conference on Digital Twins and Parallel Intelligence (DTPI) (pp. 306-311).

Peng, M., Gong, Z., **Sun. C.** , Chen, L., & Cao, D. (2020, May). Imitative reinforcement learning fusing vision and pure pursuit for self-driving. In 2020 IEEE International Conference on Robotics and Automation (ICRA) (pp. 3298-3304). IEEE.

Sun. C. , Su, L., Gu, S., Vianney, J. M. U., Qin, K., & Cao, D. (2019, October). Cross validation for CNN based affordance learning and control for autonomous driving. In 2019 IEEE Intelligent Transportation Systems Conference (ITSC) (pp. 1519-1524). IEEE.

Funding, Awards & Fellowships

2023	**Canada Mitacs Accelerate internships**, Mitacs, Canada
2022	**Chinese Government Award for Outstanding Self-financed Students Abroad**, China Scholarship Council
2019 - 2022	**University of Waterloo Graduate Scholarship**, University of Waterloo
2021	**Outstanding paper award**, 2021 IEEE 1st International Conference on Digital Twins and Parallel Intelligence (DTPI)
2014 - 2016	**University of Toronto Rogers scholarship** , University of Toronto
2011 - 2014	**People's First Class Scholarship** , University of Electronic Science and Technology of China

Teaching Experience

Summer 2023	**Introduction to Autonomous Driving Systems (ME780)**, Guest Lecturer	*University of Waterloo*
Fall 2020	**Introduction to Control Systems (ME360)**, Teaching Assistant	*University of Waterloo*
2019 - 2021	**Introduction to Microprocessors and Digital Logic (ME262)**, Teaching Assistant	*University of Waterloo*
Summer 2019	**Advanced Calculus (MTE203)**, Teaching Assistant	*University of Waterloo*
2015 - 2016	**Digital Systems (ECE241)**, Teaching Assistant	*University of Toronto*
Fall 2015	**Introduction to Computer Programming (CSC108)**, Teaching Assistant	*University of Toronto*

Mentorship Activities

2024 - Current	**Bruce Wang**, Undergraduate Research Assistant, University of Waterloo
2020 - 2021	**Lang Su**, Undergraduate Research Assistant, University of Waterloo

Patent

Wang, F., Chen, L., Cao, D., Tian, B., & **Sun, C.** (2024). Intelligent Driving System, U.S. Patent Application No. 18/035,639.

Review Activities

IEEE Transactions on Intelligent Vehicles (TIV)
IEEE Transactions on Cybernetics (TCYB)
IEEE Transactions on Artificial Intelligence (TAI)
EE/ASME Transactions on Mechatronics (TMECH)
IEEE Transactions on Fuzzy Systems (TFS)
Automotive Innovation (AUIN)
IEEE Intelligent Transportation Systems Conference (ITSC)
IEEE International Conference on Intelligent Robots and Systems (IROS)

Languages and Tools

Proficient in **Python**, **MATLAB/Simulink**, **C++**
Experience in **ROS**, **FPGA** and **PLC** programming