

Yu Jiang

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Experience

- Senior Technical Scientist**, ClearMotion – Billerica, MA 11/2023 — Present
- Leading R&D activities for motion planning and graph-based SLAM involving road surface data
 - Leading R&D activities for in-vehicle entertainment features with active suspension systems
 - Leading applied research activities with partners in both academia and industry
 - Managing the graduate student research intern program in the CTO office
- Principal Scientist**, ClearMotion – Billerica, MA 05/2021 — 11/2023
- Responsible for Z-motion planning and control with active suspension
- Owner and Consultant**, Findop Solutions LLC – Wellesley, MA 04/2020 — 04/2021
- Technical consulting on autonomous driving for startup companies
- Technical Lead – Control Systems**, ISEE AI – Cambridge, MA 10/2019 — 04/2020
- Led the controls team of five engineers
 - Designed planning and control algorithms for robust and accurate trailer backing
 - Led the cross-team efforts on designing the planning and control interface
- Principal Controls Engineer**, ISEE AI – Cambridge, MA 01/2019 — 10/2019
- Started the controls team
 - Improved the steering and speed control algorithms for passenger and commercial vehicles
 - Integrated MBD (model-based design) into autonomous software development
 - Supported weekly road testing and data analysis
- Senior Controls Researcher**, ClearMotion – Billerica, MA 07/2017 — 01/2019
- Responsible for R&D of preview suspension control
- Software Engineer**, MathWorks – Natick, MA 07/2015 — 06/2017
- Core developer of Simulink Control Design Toolbox
 - Led cross-team collaboration with Simulink Solvers and Physical Modeling
- Application Support Engineer**, MathWorks – Natick, MA 06/2014 — 06/2015
- Technical support in the CDA (Control Design and Automation) group
 - Worked with Stateflow and Simulink Solvers Team on feature development and software testing
- Research Intern**, Mitsubishi Electric Research Laboratories – Cambridge, MA 06/2013 — 08/2013
- Summer intern in the Mechatronics Group
 - Solved a non-convex optimization problem in the optimal control of an electromechanical system.
- Research and Teaching Assistant**, New York University – Brooklyn, NY 06/2013 — 08/2013
- Researched on the integration of nonlinear control theory with reinforcement learning.
 - Researched on mathematical modeling of the central nervous systems (CNS) and physiological feedback control mechanisms.
 - Teaching Assistant in the lab session of an undergraduate feedback control class
- Research Assistant**, The Chinese University of Hong Kong – Hong Kong 10/2007 — 12/2007
- Worked in the Dept. of Mechanical and Automation Engineering
 - Researched on output regulation theory for non-minimum phase nonlinear systems

Education

New York University, PhD in Electrical Engineering (Control) 08/2009 – 05/2014

- Top 1 in the ECE Department PhD Qualifying Exam
- Best PhD Dissertation award in the ECE Department
- Minor in Mathematics at Courant Institute of Mathematics
- Dissertation topic was on reinforcement learning for nonlinear control
- Dissertation has been published as a book with Wiley in 2017

South China University of Technology, MS in Automatic Control 09/2006 – 06/2009

- GPA 88/100, ranked top 5% of department
- Visited the Hong Kong Chinese University to work on nonlinear control

Sun Yat-Sen (Zhongshan) University, BS in Mathematics 09/2002 – 06/2006

- Selected for National Key Class, a program for students achieving top scores in the national college entrance exam
- GPA 85/100, ranked top 10% of class

Publications

Book

- [1] Y. Jiang and Z.-P. Jiang, *Robust Adaptive Dynamic Programming*. John Wiley & Sons, 2017.

Book Chapters

- [1] S. Guo, Y. Jiang, J. Li, D. Zhou, S. Su, M. J. Bocus, X. Zhu, Q. Chen, and R. Fan, “Road environment perception for safe and comfortable driving,” in *Autonomous Driving Perception: Fundamentals and Applications*. Springer, 2023, ch. 11, pp. 357–387.
- [2] Y. Jiang and Z.-P. Jiang, “Robust adaptive dynamic programming,” in *Reinforcement Learning and Approximate Dynamic Programming for Feedback Control*. John Wiley and Sons, 2012, ch. 13, pp. 281–302.

Journal Papers

- [1] C. Guan and Y. Jiang, “A tractor-trailer parking control scheme using adaptive dynamic programming,” *Complex & Intelligent Systems*, vol. 8, no. 3, pp. 1835–1845, 2022.
- [2] N. Ma, J. Fan, W. Wang, J. Wu, Y. Jiang, L. Xie, and R. Fan, “Computer vision for road imaging and pothole detection: A state-of-the-art review of systems and algorithms,” *Transportation Safety and Environment*, vol. 4, no. 4, tdac026, 2022.
- [3] Y. Wang, J. Hou, C. Li, J. Wu, Y. Jiang, M. Liu, and J. Y. Hung, “Ultrafast mode reversal coriolis gyroscopes,” *IEEE/ASME Transactions on Mechatronics*, vol. 27, no. 6, pp. 5969–5980, 2022.
- [4] C. Zhang, H.-J. Sun, J. Wu, Z. Fei, Y. Jiang, and G. Zhang, “Spacecraft attitude control with mutating orbital rate and actuator fading under markovian jump framework,” *Aircraft Engineering and Aerospace Technology*, vol. 94, no. 5, pp. 667–675, 2022.
- [5] C. Zhang, J. Wu, Y. Huang, Y. Jiang, M.-Z. Dai, and M. Wang, “Constructive schemes to spacecraft attitude control with low communication frequency using sampled-data and encryption approaches,” *Aircraft Engineering and Aerospace Technology*, vol. 93, no. 2, pp. 267–274, 2021.
- [6] W. Gao, Y. Jiang, and M. Davari, “Data-driven cooperative output regulation of multi-agent systems via robust adaptive dynamic programming,” *IEEE Transactions on Circuits and Systems II: Express Briefs*, vol. 66, no. 3, pp. 447–451, 2018.
- [7] T. Bian, Y. Jiang, and Z.-P. Jiang, “Adaptive dynamic programming for stochastic systems with state and control dependent noise,” *IEEE Transactions on Automatic Control*, vol. 61, no. 12, pp. 4170–4175, 2016.
- [8] W. Gao, Y. Jiang, Z.-P. Jiang, and T. Chai, “Output-feedback adaptive optimal control of interconnected systems based on robust adaptive dynamic programming,” *Automatica*, vol. 72, pp. 37–45, 2016.

- [9] Y. **Jiang**, Y. Wang, S. A. Bortoff, and Z.-P. Jiang, “An iterative approach to the optimal co-design of linear control systems,” *International Journal of Control*, vol. 89, no. 4, pp. 680–690, 2016.
- [10] Y. **Jiang** and Z.-P. Jiang, “A robust adaptive dynamic programming principle for sensorimotor control with signal-dependent noise,” *Journal of Systems Science and Complexity*, vol. 28, no. 2, pp. 261–288, 2015.
- [11] Y. **Jiang** and Z.-P. Jiang, “Global adaptive dynamic programming for continuous-time nonlinear systems,” *IEEE Transactions on Automatic Control*, vol. 60, no. 11, pp. 2917–2929, 2015.
- [12] Y. **Jiang**, Y. Wang, S. A. Bortoff, and Z.-P. Jiang, “Optimal codesign of nonlinear control systems based on a modified policy iteration method,” *IEEE transactions on neural networks and learning systems*, vol. 26, no. 2, pp. 409–414, 2015.
- [13] Y. **Jiang**, Y. Wang, S. A. Bortoff, and Z.-P. Jiang, “Nonlinear optimal co-design based on a modified policy iteration method,” *IEEE Transactions on Neural Networks and Learning Systems*, vol. 26, no. 2, pp. 409–414, Jan. 2015.
- [14] T. Bian, Y. **Jiang**, and Z. Jiang, “Decentralized adaptive optimal control of large-scale systems with application to power systems,” *IEEE Transactions on Industrial Electronics*, vol. 62, no. 4, pp. 2439–2447, 2014.
- [15] T. Bian, Y. **Jiang**, and Z.-P. Jiang, “Adaptive dynamic programming and optimal control of nonlinear nonaffine systems,” *Automatica*, vol. 50, no. 10, pp. 2624–2632, 2014.
- [16] Y. **Jiang** and Z.-P. Jiang, “Robust adaptive dynamic programming and feedback stabilization of nonlinear systems,” *IEEE Transactions on Neural Networks and Learning Systems*, vol. 25, no. 5, pp. 882–893, 2014.
- [17] Y. **Jiang** and Z.-P. Jiang, “Adaptive dynamic programming as a theory of sensorimotor control,” *Biological Cybernetics*, vol. 108, no. 4, pp. 459–473, 2014.
- [18] Y. **Jiang** and Z.-P. Jiang, “Robust adaptive dynamic programming with an application to power systems,” *IEEE Transactions on Neural Networks and Learning Systems*, vol. 24, no. 7, pp. 1150–1156, 2013.
- [19] Z.-P. Jiang and Y. **Jiang**, “Robust adaptive dynamic programming for linear and nonlinear systems: An overview,” *European Journal of Control*, vol. 19, no. 5, pp. 417–425, 2013.
- [20] N. Qian, Y. **Jiang**, Z.-P. Jiang, and P. Mazzoni, “Movement duration, fitts’s law, and an infinite-horizon optimal feedback control model for biological motor systems,” *Neural Computation*, vol. 25, no. 3, pp. 697–724, 2013.
- [21] Y. **Jiang** and Z.-P. Jiang, “Computational adaptive optimal control for continuous-time linear systems with completely unknown dynamics,” *Automatica*, vol. 48, no. 10, pp. 2699–2704, 2012.
- [22] Y. **Jiang** and Z.-P. Jiang, “Robust adaptive dynamic programming for large-scale systems with an application to multimachine power systems,” *IEEE Transactions on Circuits and Systems II: Express Briefs*, vol. 59, no. 10, pp. 693–697, 2012.
- [23] Y. **Jiang** and Z.-P. Jiang, “Approximate dynamic programming for optimal stationary control with control-dependent noise,” *IEEE Transactions on Neural Networks*, vol. 22, no. 12, pp. 2392–2398, 2011.

Conference Papers

- [1] S. Chakraborty, Y. **Jiang**, and Z.-P. Jiang, “On XYZ-motion planning using a full car model,” in *Proceedings of the 2024 American Control Conference (ACC)*, Toronto, Ontario, Canada, 2024, pp. 245–250.
- [2] Y. **Jiang**, W. Graves, M. Giovanardi, and Z. Anderson, “On XYZ-motion planning for autonomous vehicles with active suspension systems,” in *Proceedings of the 2023 American Control Conference (ACC)*, San Diego, CA, USA, 2023, pp. 3181–3186.
- [3] R. Fan, Y. Zhang, S. Guo, J. Li, Y. Feng, S. Su, Y. Zhang, W. Wang, Y. **Jiang**, M. J. Bocus, *et al.*, “Urban digital twins for intelligent road inspection,” in *Proceedings of the 2022 IEEE International Conference on Big Data*, Osaka, Japan, 2022, pp. 5110–5114.
- [4] Y. **Jiang**, J. Eisenmann, W. Graves, V. Sridhar, and Z. Anderson, “Terrain-based vehicle localization using an active suspension system,” in *Proceedings of the 2022 IEEE Conference on Control Technology and Applications (CCTA)*, Trieste, Italy, 2022, pp. 752–757.
- [5] W. Qin, X. Zhao, Y. **Jiang**, X. Wang, and D. Xu, “Approximate path following control of robotic manipulators: An adaptive dynamic programming-based method,” in *Proceedings of the 2022 China Automation Congress (CAC)*, Xiamen, China, 2022, pp. 3909–3914.

- [6] J. Zhang, S. Wang, H. Wang, J. Lai, Z. Bing, Y. **Jiang**, Y. Zheng, and Z. Zhang, “An adaptive approach to whole-body balance control of wheel-bipedal robot ollie,” in *Proceedings of the 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Kyoto, Japan, 2022, pp. 12 835–12 842.
- [7] T. Bian, Y. **Jiang**, and Z.-P. Jiang, “Adaptive dynamic programming for nonlinear nonaffine systems,” in *53rd IEEE Conference on Decision and Control*, IEEE, 2014, pp. 3603–3608.
- [8] W. Gao, Y. **Jiang**, Z.-P. Jiang, and T. Chai, “Adaptive and optimal output feedback control of linear systems: An adaptive dynamic programming approach,” in *Proceedings of the 11th World Congress on Intelligent Control and Automation (WCICA)*, Shenyang, China, 2014, pp. 2085–2090.
- [9] Y. **Jiang** and Z.-P. Jiang, “Global adaptive dynamic programming for continuous-time nonlinear polynomial systems,” in *Proceedings of the 19th World Congress*, vol. 19, Cape Town, South Africa, Aug. 2014, pp. 9756–9761.
- [10] Y. **Jiang** and Z.-P. Jiang, “Robust adaptive dynamic programming for optimal nonlinear control design,” in *Proceedings of the 9th Asian Control Conference (ASCC)*, Istanbul, Turkey, 2013.
- [11] Y. **Jiang** and Z.-P. Jiang, “Robust adaptive dynamic programming for sensorimotor control with signal-dependent noise,” in *Proceedings of the 2013 IEEE Signal Processing in Medicine and Biology Symposium (SPMB)*, 2013, pp. 1–6.
- [12] Z.-P. Jiang and Y. **Jiang**, “A new approach to robust and optimal nonlinear control design,” in *Proceedings of the 3rd IASTED Asian Conference on Modelling, Identification, and Control (AsiaMIC)*, Phuket, Thailand, 2013, pp. 144–151.
- [13] Z.-P. Jiang and Y. **Jiang**, “Robust adaptive dynamic programming: Recent results and applications,” in *Proceedings of the 32nd Chinese Control Conference (CCC)*, 2013, pp. 968–973.
- [14] Y. **Jiang** and Z.-P. Jiang, “Computational adaptive optimal control with an application to blood glucose regulation in type 1 diabetics,” in *Proceedings of the 31st Chinese Control Conference*, Hefei, China, 2012, pp. 2938–2943.
- [15] Y. **Jiang** and Z.-P. Jiang, “Robust adaptive dynamic programming for nonlinear control design,” in *Proceedings of the 51st Conference on Decision and Control*, 2012, pp. 1896–1901.
- [16] Y. **Jiang** and Z.-P. Jiang, “Robust adaptive dynamic programming: An overview of recent results,” in *Proceedings of the 20th International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, Melbourne, Australia, Jul. 2012.
- [17] Y. **Jiang**, S. Chemudupati, J. M. Jorgensen, Z.-P. Jiang, and C. S. Peskin, “Optimal control mechanism involving the human kidney,” in *Decision and Control and European Control Conference (CDC-ECC), 2011 50th IEEE Conference on*, IEEE, 2011, pp. 3688–3693.
- [18] Y. **Jiang** and Z.-P. Jiang, “Approximate dynamic programming for stochastic systems with additive and multiplicative noise,” in *Proceedings of the 2011 IEEE International Symposium on Intelligent Control*, Denver, CO, USA, 2011, pp. 185–190.
- [19] Y. **Jiang** and Z.-P. Jiang, “Robust approximate dynamic programming and global stabilization with nonlinear dynamic uncertainties,” in *Proceedings of the 50th IEEE Conference on Decision and control*, Orlando, FL, USA, 2011, pp. 115–120.
- [20] Y. **Jiang**, Z.-P. Jiang, and N. Qian, “Optimal control mechanisms in human arm reaching movements,” in *Proceedings of the 30th Chinese Control Conference (CCC)*, Yantai, China, Jul. 2011, pp. 1377–1382.
- [21] Y. **Jiang** and Z.-P. Jiang, “Approximate dynamic programming for output feedback control,” in *Proceedings of the 29th Chinese Control Conference (CCC)*, Beijing, China, Jul. 2010, pp. 5815–5820.
- [22] Y. **Jiang** and J. Huang, “Output regulation for a class of weakly minimum phase systems and its application to a nonlinear benchmark system,” in *Proceedings of the 2009 American Control Conference (ACC)*, St. Louis, Missouri, USA, 2009, pp. 5321–5326.

Patents

- [1] C. Guan and Y. **Jiang**, *Simultaneous localization and mapping using road surface data*, US Patent 11,933,616, Mar. 2024.
- [2] C. Guan and Y. **Jiang**, *Vehicle sensors arrangement and method for mapping the road profiles*, US Patent 11,884,278, Jan. 2024.

- [3] V. Sridhar, J. P. Eisenmann, Y. **Jiang**, and D. F. Weatherwax, *Road surface-based vehicle control*, US Patent App. 18/344,943, Mar. 2024.
- [4] M. Giovanardi, M. F. Alanis, J. A. Ekchian, P. A. DiZio, J. R. Lackner, A. C. Chetty, and Y. **Jiang**, *Method and apparatus for motion sickness mitigation in a vehicle*, US Patent App. 17/920,642, May 2023.
- [5] V. Sridhar, J. P. Eisenmann, Y. **Jiang**, and D. F. Weatherwax, *Road surface-based vehicle control*, US Patent 11,733,707, Aug. 2023.
- [6] F. Zhang, Y. **Jiang**, and M. K. Yeddanapudi, *Systems and methods for highlighting graphical models*, US Patent 11,853,690, Dec. 2023.
- [7] A. C.-H. Chen, Y. **Jiang**, J. A. Ekchian, M. Giovanardi, *et al.*, *Vehicle localization systems and methods*, US Patent App. 17/489,924, Jun. 2022.
- [8] J. P. Eisenmann, W. Graves, Y. **Jiang**, M. J. Proctor, and J. A. Ekchian, *Multi-lane road characterization and tracking algorithms*, US Patent App. 17/773,676, Dec. 2022.
- [9] Y. **Jiang**, V. Sridhar, J. P. Eisenmann, W. Graves, M. W. Finnegan, *et al.*, *Vehicular localization systems, methods, and controls*, US Patent App. 17/436,012, Jun. 2022.
- [10] V. Sridhar, J. P. Eisenmann, Y. **Jiang**, and D. F. Weatherwax, *Road surface-based vehicle control*, US Patent 10,901,432, Jan. 2021.
- [11] V. Sridhar, J. P. Eisenmann, Y. **Jiang**, and D. F. Weatherwax, *Vehicle control based on localization and road data*, US Patent US11801726B2, May 2020.
- [12] Y. Wang, Y. **Jiang**, and B. A. Scott, *Motion-control system for performing different tasks*, US Patent US9529341B2, Dec. 2016.

Awards

Excellent Reviewer	2016
<ul style="list-style-type: none"> • Journal of Guidance, Control, and Dynamics (JGCD), Oct. 1st, 2015 – Sept. 30th, 2016. 	
Alexander Hessel Award	2015
<ul style="list-style-type: none"> • Best Ph.D. Dissertation in Electrical Engineering, ECE Dept in Tandon School of Engineering at NYU, 2015 	
Shimemura Young Author Prize	2013
<ul style="list-style-type: none"> • The 9th Asian Control Conference, Istanbul, Turkey, June 2013. 	
Richard Rosenthal Award	2010
<ul style="list-style-type: none"> • Outstanding (Top 1) performance on the electrical engineering PhD Qualifying Examination, ECE Dept in Tandon School of Engineering at NYU, 2010 	
Huawei Scholarship for outstanding students	2008
<ul style="list-style-type: none"> • South China University of Technology, 2008 	
National First Place	2007
<ul style="list-style-type: none"> • The Chinese Graduate Mathematical Contest in Modeling, 2007 	
National First Place	2005
<ul style="list-style-type: none"> • The Chinese Undergraduate Mathematical Contest in Modeling, 2005 	

Services

Reviewer for Conferences and Journals

- Conferences: American Control Conference; Conferences on Decision and Control
- Journals: IEEE Transactions on Automatic Control (TAC); Automatica; IEEE Transactions on Neural Network and Learning Systems (TNNLS)

Early Career Advisory Board

2022 – 2024

- Control Engineering Practice (CEP), an IFAC Journal