WENJIE CHEN (陈文杰)

Email: wjchen84 AT gmail.com

http://wjchen84.github.io/

EDUCATIONS

Ph.D. **University of California, Berkeley** Mechanical Engineering 08/2012
Dissertation: *Intelligent Control of Robots with Mismatched Dynamics and Mismatched Sensing*
Advisor: Professor Masayoshi Tomizuka

M.S. **University of California, Berkeley** Mechanical Engineering 05/2009
Thesis: *Hybrid Adaptive Friction Compensation of Indirect Drive Trains Using Joint Sensor Fusion*
Advisor: Professor Masayoshi Tomizuka

B.Eng. **Zhejiang University**, China Mechatronic Engineering 06/2007
Rank: 1/55(major) Advanced Honor Class of Engineering Education (*63 elites from over 6000*)
Thesis: *Coordinated Motion Control of Biaxial Linear-Motor-Driven Stage*
Advisor: Professor Bin Yao, Professor Qingfeng Wang

POSITIONS

Chief Research Engineer (主任), FANUC Corporation 10/2017 – Present
Robot Software Research Department, Basic Laboratory

- Technical lead for research development of robot software: motion planning and control, optimization and learning, etc.
- Manage and lead the frontier robotic research collaboration with university

Chief Research Engineer (主任), FANUC Corporation 11/2013 – 10/2017
Learning Robot Development Department, Robot Laboratory

- Technical lead for research and development of next generation robot concept controller
- Manage and lead the frontier robotic research collaboration with university
- Technical guidance and support for current learning robot product development

Postdoctoral Scholar, University of California, Berkeley 08/2012 – 10/2013
Mechanical Systems Control Lab, Department of Mechanical Engineering

HONORS & AWARDS (SELECTED)

- **Best Application Paper Finalist**, *the 12th Conference on Automation Science and Engineering (CASE)* 2016
- **Best Student Paper Finalist**, *IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)* 2015
- **Best Student Paper Finalist**, *the 6th IFAC Symposium on Mechatronic Systems* 2013
- **Best Paper in Session Award**, *ASME Dynamic Systems and Control Conference* 2012
- **Third place, Big Ideas @ Berkeley**, *"The PikaPen"* 04/2012
"Information Technology for Society" Category, 5 winners out of over 125 submissions

- **Block Grant Award**, University of California, Berkeley 01/2011
- **Chiang Chen Overseas Graduate Fellowship**, China 2007 – 2008
  10 awardees each year for overseas graduates from China
- Numerous undergraduate awards, Zhejiang University, China 2002 – 2007
  Details at http://wjchen84.github.io/index.html#Honors

PROFESSIONAL AFFILIATIONS & SERVICES

Institute of Electrical and Electronics Engineers (IEEE), Member
American Society of Mechanical Engineers (ASME), Member

Award Juror Panel:
IEEE/IFR IERA Award (Innovation and Entrepreneurship in Robotics and Automation), 2017

Proposal Review Panel:
External Reviewer of the Research Grants Council, Hong Kong (2013, 2014, 2016, 2017);
Award Judge of IERA Award (Innovation and Entrepreneurship in Robotics and Automation), IEEE/RAS and IFR, 2017

Editorial Board:
Editorial Board Member of the International Journal of Advanced Robotic Systems (IJARS)

Conference Committee:
Program Committee, 2016 ASME International Symposium on Flexible Automation (ISFA);
Associate Editor, 2016 American Control Conference (ACC);
Associate Editor, 2015 ASME Dynamic Systems and Control Conference (DSCC);
Associate Editor, 2015 American Control Conference (ACC);
Topic & Session Organizer, 2014 ASME Dynamic Systems and Control Conference (DSCC);
Program Committee, 2013 IEEE International Conference on Information and Automation (ICIA);
Program Committee, 2013 IEEE International Conference on Robotics and Biomimetics (ROBIO)

Journal Referee:
IEEE Transactions on Robotics (T-RO), IEEE Transactions on Industrial Electronics (TIE), IEEE/ASME Transactions on Mechatronics (TMECH), IEEE Transactions on Control Systems Technology (TCST), IEEE Transactions on Automation Science and Engineering (T-ASE), ASME Journal of Dynamic Systems, Measurement, and Control (JDSMC), Robotics and Computer Integrated Manufacturing (Elsevier-RCIM), Robotics and Autonomous Systems (RAS), International Journal of Advanced Robotic Systems (IJARS), Advanced Robotics (RSJ-AR), Asian Journal of Control (AJC), Control and Cybernetics, Sensors (MDPI Journal), Journal of Zhejiang University Science C (Computers & Electronics) (ZUSC)

Conference Referee:
American Control Conference (ACC), IEEE Conference on Decision and Control (CDC), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), IEEE International Conference on Robotics and Automation (ICRA), IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), ASME Dynamic Systems and Control Conference (DSCC), ASME International Symposium on Flexible Automation (ISFA), IFAC Symposium on Robot Control (SY-

ROCO), IEEE International Conference on Information and Automation (ICIA), IEEE International Conference on Robotics and Biomimetics (ROBIO)

PUBLICATIONS

Journal Publications

7. Junkai Lu, Kevin Haninger, **Wenjie Chen**, Masayoshi Tomizuka, Suraj Gowda, and Jose M. Carmena, "Design of a Passive Upper Limb Exoskeleton for Macaque Monkeys," *ASME Journal of Dynamic Systems, Measurement, and Control*, 138(11), 111011 (Jul 27, 2016); doi: 10.1115/1.4033837
6. Pedro Reynoso-Mora, **Wenjie Chen**, and Masayoshi Tomizuka, "A Convex Relaxation for the Time-optimal Trajectory Planning of Robotic Manipulators along Predetermined Geometric Paths," *Optimal Control Applications and Methods*, vol. 37, no. 6, pp. 1263–1281, Nov./Dec. 2016; doi: 10.1002/oca.2234
5. **Wenjie Chen**, Kyoungchul Kong, and Masayoshi Tomizuka, "Dual-Stage Adaptive Friction Compensation for Precise Load Side Position Tracking of Indirect Drive Mechanisms," *Control Systems Technology, IEEE Transactions on*, vol. 23, no. 1, pp. 164–175, Jan. 2015; doi: 10.1109/TCST.2014.2317776
4. **Wenjie Chen**, and Masayoshi Tomizuka, "Dual-Stage Iterative Learning Control for MIMO Mismatched System with Application to Robots with Joint Elasticity," *Control Systems Technology, IEEE Transactions on*, vol. 22, no. 4, pp. 1350–1361, July 2014; doi: 10.1109/TCST.2013.2279652
3. **Wenjie Chen**, and Masayoshi Tomizuka, "Direct Joint Space State Estimation in Robots with Multiple Elastic Joints," *Mechatronics, IEEE/ASME Transactions on*, vol. 19, no. 2, pp. 697–706, April 2014; doi: 10.1109/TMECH.2013.2255308
2. **Wenjie Chen**, and Masayoshi Tomizuka, "Comparative Study on State Estimation in Elastic Joints," *Asian Journal of Control*, vol. 16, no. 3, pp. 818–829, May 2014; doi: 10.1002/asjc.755
1. Jonathan Asensio, **Wenjie Chen**, and Masayoshi Tomizuka, "Feedforward Input Generation Based on Neural Network Prediction in Multi-Joint Robots," *Journal of Dynamic Systems, Measurement, and Control*, 136(3), 031002, May 2014; doi:10.1115/1.4025986

Refereed Conference Proceedings

26. Yongxiang Fan, Wei Gao, **Wenjie Chen**, and Masayoshi Tomizuka, "Real-Time Finger Gaits Planning for Dexterous Manipulation," *in Proceedings of the 20th World Congress of the International Federation of Automatic Control (IFAC)*, Toulouse, France, July 9–14, 2017
25. Chung-Yen Lin, **Wenjie Chen**, and Masayoshi Tomizuka, "Learning Control for Task Specific Industrial Robots," *in Proceedings of the 55th IEEE Conference on Decision and Control (CDC)*, Las Vegas, USA, December 12–14, 2016
24. Te Tang, Changliu Liu, **Wenjie Chen**, and Masayoshi Tomizuka, "Robotic Manipulation of Deformable Objects by Tangent Space Mapping and Non-Rigid Registration," *in Proceedings of the 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Deajeon, Korea, October 9–14, 2016
23. Yu Zhao, **Wenjie Chen**, Te Tang, and Masayoshi Tomizuka, "Zero Time Delay Input Shaping for Smooth Settling of Industrial Robots," *in Proceedings of the 12th Conference on Automa-*

tion Science and Engineering (CASE, ISAM 2016), Fort Worth, TX, USA, August 21–24, 2016

22. Te Tang, Hsien-Chung Lin, Yu Zhao, **Wenjie Chen**, and Masayoshi Tomizuka, "Autonomous Alignment of Peg and Hole by Force/Torque Measurement for Robotic Assembly," *in Proceedings of the 12th Conference on Automation Science and Engineering (CASE, ISAM 2016)*, Fort Worth, TX, USA, August 21–24, 2016 **(Best Application Paper Finalist)**
21. Te Tang, Hsien-Chung Lin, Yu Zhao, Yongxiang Fan, **Wenjie Chen**, and Masayoshi Tomizuka, "Teach Industrial Robots Peg-Hole-Insertion by Human Demonstration," *in Proceedings of the 2016 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*, Banff, Alberta, Canada, July 12–15, 2016
20. Yongxiang Fan, Hsien-Chung Lin, Yu Zhao, Chung-Yen Lin, Te Tang, Masayoshi Tomizuka, and **Wenjie Chen**, "Object Position and Orientation Tracking for Manipulators Considering Unnegligible Sensor Physics," *in Proceedings of the 2016 International Symposium on Flexible Automation (ISFA)*, Cleveland, USA, August 1–3, 2016
19. Chung-Yen Lin, Yu Zhao, Masayoshi Tomizuka, and **Wenjie Chen**, "Path-Constrained Trajectory Planning for Robot Service Life Optimization," *in Proceedings of the 2016 American Control Conference (ACC)*, Boston, MA, USA,July 6–8, 2016
18. Hsien-Chung Lin, Te Tang, Yongxiang Fan, Yu Zhao, Masayoshi Tomizuka, and **Wenjie Chen**, "Robot Learning from Human Demonstration with Remote Lead through Teaching," *in Proceedings of the 2016 European Control Conference (ECC)*, Aalborg, Denmark, June 29–July 1, 2016
17. Hsien-Chung Lin, Te Tang, Masayoshi Tomizuka, and **Wenjie Chen**, "Remote Lead Through Teaching by Human Demonstration Device," *in Proceedings of the 8th ASME Dynamic Systems and Control Conference (DSCC)*, Columbus, Ohio, USA, October 28–30, 2015
16. Junkai Lu, Kevin Haninger, **Wenjie Chen**, and Masayoshi Tomizuka, "Design and Torque-Mode Control of a Cable-Driven Rotary Series Elastic Actuator for Subject-Robot Interaction," *in Proceedings of the IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*, Busan, Korea, pp. 158–164, July 7–11, 2015 **(Best Student Paper Finalist)**
15. Junkai Lu, **Wenjie Chen**, Kevin Haninger, and Masayoshi Tomizuka, "A Passive Upper Limb Exoskeleton for Macaques in a BMI Study – Kinematic Design, Analysis, and Calibration," *in Proceedings of the 7th ASME Dynamic Systems and Control Conference (DSCC)*, San Antonio, Texas, USA, October 22–24, 2014
14. Kevin Haninger, Junkai Lu, **Wenjie Chen**, and Masayoshi Tomizuka, "Kinematic Design and Analysis for a Macaque Upper-Limb Exoskeleton with Shoulder Joint Alignment," *in Proceedings of the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Chicago, Illinois, USA, September 14–18, 2014
13. Yizhou Wang, **Wenjie Chen**, Masayoshi Tomizuka, and Badr N. Alsuwaidan, "Model Predictive Sliding Mode Control – for Constraint Satisfaction and Robustness," *in Proceedings of the 6th ASME Dynamic Systems and Control Conference (DSCC)*, Palo Alto, CA, October 21–23, 2013

12. Chung-Yen Lin, **Wenjie Chen**, and Masayoshi Tomizuka, "Automatic Sensor Frame Identification in Industrial Robots with Joint Elasticity," *in Proceedings of the 6th ASME Dynamic Systems and Control Conference (DSCC)*, Palo Alto, CA, October 21–23, 2013

11. Pedro Reynoso-Mora, **Wenjie Chen**, and Masayoshi Tomizuka, "On the Time-optimal Trajectory Planning and Control of Robotic Manipulators Along Predefined Paths," *in Proceedings of the 2013 American Control Conference (ACC)*, Washington, DC, June 17–19, 2013

10. Chi-Shen Tsai, **Wenjie Chen**, Daekyu Yun, and Masayoshi Tomizuka, "Iterative Learning Control for Vibration Reduction in Industrial Robots with Link Flexibility," *in Proceedings of the 2013 American Control Conference (ACC)*, Washington, DC, June 17–19, 2013

9. Junkai Lu, **Wenjie Chen**, and Masayoshi Tomizuka, "Kinematic Design and Analysis of a 6-DOF Upper Limb Exoskeleton Model for a Brain-Machine Interface Study," *in Proceedings of the 6th IFAC Symposium on Mechatronic Systems (Mechatronics '13)*, Hangzhou, China, pp. 293–300, April 10–12, 2013 **(Best Student Paper Finalist)**

8. Yizhou Wang, **Wenjie Chen**, and Masayoshi Tomizuka, "Extended Kalman Filtering for Robot Joint Angle Estimation Using MEMS Inertial Sensors," *in Proceedings of the 6th IFAC Symposium on Mechatronic Systems (Mechatronics '13)*, Hangzhou, China, pp. 406–413, April 10–12, 2013

7. **Wenjie Chen**, and Masayoshi Tomizuka, "Iterative Learning Control with Sensor Fusion for Robots with Mismatched Dynamics and Mismatched Sensing," *in Proceedings of the 2012 ASME Dynamic Systems and Control Conference (DSCC)*, Fort Lauderdale, Florida, USA, pp. 1480–1488, October 17–19, 2012 **(Best Paper in Session Award)**

6. Jonathan Asensio, **Wenjie Chen**, and Masayoshi Tomizuka, "Robot Learning Control Based on Neural Network Prediction," *in Proceedings of the 2012 ASME Dynamic Systems and Control Conference (DSCC)*, Fort Lauderdale, Florida, USA, pp. 1489–1497, October 17–19, 2012

5. **Wenjie Chen**, and Masayoshi Tomizuka, "Load Side State Estimation in Robot with Joint Elasticity," *in Proceedings of the 2012 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*, Kaohsiung, Taiwan, pp. 598–603, July 11–14, 2012

4. **Wenjie Chen**, and Masayoshi Tomizuka, "A Two-Stage Model Based Iterative Learning Control Scheme for a Class of MIMO Mismatched Linear Systems," *in Proceedings of the 2012 ASME International Symposium on Flexible Automation (ISFA)*, St. Louis, Missouri, USA, paper No. ISFA2012–7199, June 18–20, 2012

3. Cong Wang, **Wenjie Chen**, and Masayoshi Tomizuka, "Robot End-effector Sensing with Position Sensitive Detector and Inertial Sensors," *in Proceedings of the 2012 IEEE International Conference on Robotics and Automation (ICRA)*, Saint Paul, Minnesota, USA, pp. 5252–5257, May 14–18, 2012

2. **Wenjie Chen**, and Masayoshi Tomizuka, "Estimation of Load Side Position in Indirect Drive Robots by Sensor Fusion and Kalman Filtering," *in Proceedings of the 2010 American Control Conference (ACC)*, Baltimore, Maryland, USA, pp. 6852–6857, June 30–July 2, 2010

1. **Wenjie Chen**, Kyoungchul Kong, and Masayoshi Tomizuka, "Hybrid Adaptive Friction Compensation of Indirect Drive Trains," *in Proceedings of the 2009 ASME Dynamic Systems and Control Conference (DSCC)*, Hollywood, California, USA, pp. 313–320, October 12–14, 2009

PATENTS

1. Robot system with function to calculate sensor position and orientation
   JP-2015203902 (Granted), US-15/281084 (Pending), CN-201610811511.0 (Pending), DE-102016012065.7 (Pending)
2. Object posture calculation system
   JP-2015177471 (Granted), US-15/259118 (Pending), CN-201610814842.X (Pending), DE-102016116404.6 (Pending)
3. Robot system with learning function
   JP-2016225207 (Pending), US-15/405190 (Pending), CN-201710025546.6 (Pending), DE-102017000063.8 (Pending)
4. Robot control system
   JP-2016159895 (Pending), US-15/676503 (Pending), CN-201710687596.0 (Pending), DE-102017118276.4 (Pending)
5. System and learning control method for a robot system with learning control function
   JP-2017026317 (Pending)
6. Device, system, and method to automatically generate robot motion trajectories
   JP-2017077711 (Pending)
7. Device and method to recognize shape and generate program
   JP-2017104819 (Pending)
8. Robot hand controller device, method, and simulation device
   JP-2017129480 (Pending)
9. Robot system
   JP-2017164063 (Pending)

TALKS & PRESENTATIONS

Besides the above conference presentations

- 05/29/2017 "Robotic Learning in Industrial Applications", in *Workshop "Recent Advances in Dynamics for Industrial Applications"*, the 2017 IEEE International Conference on Robotics and Automation (ICRA), Singapore
- 04/10/2013 "EFRI-M3C: A hybrid control systems approach to brain-machine interfaces for exoskeleton control (Overview)", Qiushi Academy for Advanced Studies, Zhejiang University, China
- 03/11/2013 "Mechatronic Considerations for Mismatched Robotic Systems", Department of Mechanical Engineering, Carnegie Mellon University
- 03/04/2013 "Mechatronic Considerations for Mismatched Robotic Systems", Department of Mechanical Engineering, Worcester Polytechnic Institute
- 02/26/2013 "Mechatronic Considerations for Mismatched Robotic Systems", Department of Mechanical Engineering and Engineering Science, University of North Carolina at Charlotte
- 08/09/2012 "Intelligent Control of Robots with Mismatched Dynamics and Mismatched Sensing", *Ph.D. seminar*, University of California, Berkeley
- 03/08/2012 "EFRI-M3C: A hybrid control systems approach to brain-machine interfaces for exoskeleton control (NSF EFRI-M3C 1137267)", *Poster presentation (group work), NSF EFRI Grantees Conference*, Arlington, VA, Mar. 07–09, 2012

- 02/28/2012 "Estimation in Robots with Mismatched Sensing", *The 1st International Workshop between University of California Berkeley and Keio University*, Berkeley, CA
- 04/26/2011 "Disturbance Cancellation Schemes for Indirect Drive Robot Manipulator", FANUC Corporation, Japan

Updated on September 27, 2017

http://wjchen84.github.io/