Wanxin Jin

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Education

Purdue University — West Lafayette, IN, USA
PhD in Autonomy and Control — *Aug. 2017 - May 2021*

Technical University of Munich (TUM) — Munich, Germany
Research Assistant at the Chair of Information-oriented Control — *Aug. 2016 - Aug. 2017*

Harbin Institute of Technology — Harbin, China
M.Sc. in Control Science and Engineering — *Sept. 2014 - Jul. 2016*

Harbin Institute of Technology — Harbin, China
B.S. in Automation (Top 5%) — *Aug. 2010 - Jun. 2014*

Research Interests

Control + Learning: Inverse optimal control, Inverse reinforcement learning, Differentiable control and learning, Safe learning and control, Optimal control, Reinforcement learning, Robust control

Robotics + Human: Learning from demonstrations, Imitation learning, Motion planning, Learning with human-in-the-loop, Human-robot interaction

Additional Interests: Image processing, Computer vision, SLAM

Teaching & Services

Teaching:

- AAE 564: Linear Systems Analysis and Synthesis — *Fall 2020, Purdue*
- AAE 364: Control Systems Analysis — *Fall 2020, Purdue*
- AAE 421: Flight Dynamics and Control — *Spring 2020, Fall 2019, Purdue*
- AAE 364L: Control System Laboratory — *Fall 2018, Purdue*
- Adaptive and Predictive Control — *Spring 2017, TUM*
- Advanced Control and Robotics Lab — *Spring 2017, TUM*

Reviewer:

- Automatica (2020)
- IEEE Transactions on Robotics (2020)
- Systems & Control Letters (2020)
- IEEE Transactions on Industrial Electronics (2020)
- IEEE Transactions on Neural Networks and Learning Systems (2019)
- IEEE Transactions on Mechatronics (2019)

Awards

- Magoon Award for Excellence in Teaching, Purdue University — *2020*
- Ross Fellowship, Purdue University — *2018*
- First prize winner of Provincial Science and Technology Award, Heilongjiang, China — *2017*
- National Scholarship for Graduates (*Top 1%*), Ministry of Education, China — *2015*
- Graduate Scholarship (*two times, Top 5%*), Harbin Institute of Technology — *2014*
- First prize in College Mathematics Competition, Chinese Mathematical Society — *2012*

Publications in PhD Study

Published & Conditionally Accepted

1. **Wanxin Jin**, Zhaoran Wang, Zhuoran Yang, and Shaoshuai Mou. Pontryagin differentiable programming: An end-to-end learning and control framework. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020. Also available as preprint arXiv:1912.12970

2. **Wanxin Jin**, Dana Kulić, Shaoshuai Mou, and Sandra Hirche. Inverse optimal control from incomplete trajectory observations. *The International Journal of Robotics Research (IJRR)*, 2020. Accepted, in press. Also available as preprint arXiv:1803.07696

3. **Wanxin Jin**, Dana Kulić, Jonathan Feng-Shun Lin, Shaoshuai Mou, and Sandra Hirche. Inverse optimal control for multiphase cost functions. *IEEE Transactions on Robotics (T-RO)*, 35(6):1387–1398, 2019

4. **Wanxin Jin** and Shaoshuai Mou. Distributed inverse optimal control. *Automatica*, 2020. Conditionally Accepted

Under review & Preprints

5. **Wanxin Jin**, Todd D Murphey, and Shaoshuai Mou. Learning from incremental directional corrections. Submitted to *IEEE Transactions on Robotics (T-RO)*, 2020, under review. Also available as preprint arXiv:2011.15014

6. **Wanxin Jin**, Todd D Murphey, Dana Kulić, Neta Ezer, and Shaoshuai Mou. Learning from sparse demonstrations. Submitted to *IEEE Transactions on Robotics (T-RO)*, 2020, under review. Also available as preprint arXiv:2008.02159

7. **Wanxin Jin**, Zihao Liang, and Shaoshuai Mou. Inverse optimal control from demonstration segments. Submitted to *IEEE International Conference on Robotics and Automation (ICRA), 2021*, under review. Also available as preprint arXiv:2010.15034

8. Sooyung Byeon, **Wanxin Jin**, Dawei Sun, and Inseok Hwang. Human-automation interaction for assisting novices to emulate experts by inferring task objective functions. Submitted to *IEEE International Conference on Robotics and Automation (ICRA), 2021*, under review

9. **Wanxin Jin**, Zhaoran Wang, Zhuoran Yang, and Shaoshuai Mou. Neural certificates for safe control policies. 2020. Available as preprint arXiv:2006.08465

Previous Publications

10. **Wanxin Jin**, Weiyang Lin, Xianqiang Yang, and Huijun Gao. Reference-free path-walking method for ball grid array inspection in surface mounting machines. *IEEE Transactions on Industrial Electronics*, 64(8):6310–6318, 2017

11. Huijun Gao, **Wanxin Jin**, Xianqiang Yang, and Okyay Kaynak. A line-based-clustering approach for ball grid array component inspection in surface-mount technology. *IEEE Transactions on Industrial Electronics*, 64(4):3030–3038, 2016

12. Xiaoguang Di, **Wanxin Jin**, and Ying Yu. Digital image stabilization with moving foreground objects. *Opt. Precision Eng.*, 22(1):177–185, 2014

Previous Granted Patents

1. Huijun Gao, **Wanxin Jin**, Xianqiang Yang, Jinyong Yu, Guanghui Sun, Weiyang Lin, and Zhan Li. Multi-type bga chip visual recognition method using line-based-clustering, 2017. US Patent US9965847

2. Huijun Gao, **Wanxin Jin**, Jinyong Yu, and Weiyang Lin. A subpixel edge detection algorithm for blurred images, 2016. Chinese Patent CN106651828B

3. Huijun Gao, **Wanxin Jin**, Jun Teng, and Zhan Li. Modified hough transformation for fast image registration, 2016. Chinese Patent CN106485731B

4. **Wanxin Jin**, Huijun Gao, Sheng Yin, and Guang Wang. A co-occurrence matrix method for thread recognition, 2015. Chinese Patent CN105160656B

5. Huijun Gao, **Wanxin Jin**, Xianqiang Yang, Jinyong Yu, and Hao Sun. A grid array graphic code and its visual recognition, 2015. Chinese Patent CN105095937B

6. Xiaoguang Di and **Wanxin Jin**. An adaptive image stabilization algorithm, 2013. Chinese Patent CN103079037B

7. Xiaoguang Di, **Wanxin Jin**, Xuejian Dong, Hongmei Gao, and Jianfei Xu. A fast image stabilization algorithm for large-scale rotational vibrations, 2013. Chinese Patent CN103841296B