

# Wanxin Jin

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## Education

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### Purdue University

*PhD in Autonomy and Control*

West Lafayette, IN, USA

*Aug. 2017 - May 2021*

### Technical University of Munich (TUM)

*Research Assistant at the Chair of Information-oriented Control*

Munich, Germany

*Aug. 2016 - Aug. 2017*

### Harbin Institute of Technology

*M.Sc. in Control Science and Engineering*

Harbin, China

*Sept. 2014 - Jul. 2016*

### Harbin Institute of Technology

*B.S. in Automation (Top 5%)*

Harbin, China

*Aug. 2010 - Jun. 2014*

## Research Interests

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**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

## Professional Services

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**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

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- 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

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### 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](https://arxiv.org/abs/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](https://arxiv.org/abs/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](https://arxiv.org/abs/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](https://arxiv.org/abs/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](https://arxiv.org/abs/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](https://arxiv.org/abs/2006.08465)

### Previous Publications

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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

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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