

# Ruikun Luo

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## EDUCATION

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### University of Michigan, Ann Arbor, MI

Ph.D., Robotics, *Dec 2020* (Expected).

Advisor: Xi Jessie Yang

### Carnegie Mellon University, Pittsburgh, PA

M.S., Mechanical Engineering, *May 2014*.

Advisor: Katia Sycara

### Tsinghua University, Beijing, China

B.E., Mechanical Engineering and Automation, *July 2012*.

Innovative Talent Cultivating Program, *July 2012*.

Advisor: Jing Xu

## RESEARCH EXPERIENCE

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### Research Assistant

May 2018 - Present

*Faculty advisor: Xi Jessie Yang*

*Interaction and Collaboration Research Lab, University of Michigan*

- Project 1: Realtime Workload Estimation Via Physiological Measurements
- Project 2: Workload Adaptive Haptic Shared Control Scheme for Semi-Autonomous Driving
- Project 3: Explainable AI: an Option-Centric Rationale Approach
- Project 4: Robot Docent to Arouse Visitors' Interest in Art Museum

### Research Assistant

June 2016 - May 2018

*Faculty advisor: Dmitry Berenson*

*Autonomous Robotic Manipulation Lab, University of Michigan*

- Project : Robot Motion Planning with Actuation Uncertainty in Contact-rich Environment

### Research Assistant

Sep. 2014 - June 2016

*Faculty advisor: Dmitry Berenson*

*Autonomous Robotic Collaboration Laboratory, Worcester Polytechnic Institute*

- Project 1: Unsupervised Online Human Reaching Motion Recognition and Early Prediction
- Project 2: Human Robot Collaboration in Shared Workspace

### Research Assistant

Aug. 2012 - May 2014

*Faculty advisor: Katia Sycara*

*Advanced Agent-Robotics Technology Lab, Carnegie Mellon University*

- Project 1: Supervisory Control for Cost-Effective Redistribution of Robotic Swarms
- Project 2: Human Activity Recognition for Sequential Tasks from RGBD data

## Research Assistant

Aug. 2011 - June 2012

*Faculty advisor: Jing Xu and Li Liu*

*Institute of Mechatronic Engineering, Tsinghua University*

- Undergraduate Thesis: Active Dancing Partner Robot Based on Kinect
- Project : Humanoid Soccer Robot

## MENTORING EXPERIENCE

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### University of Michigan

May 2018 - Present

- Mentored 4 master students and 3 undergraduates. Two students continued Ph.D. at University of Michigan, Ann Arbor and University of Texas at Austin.

### Worcester Polytechnic Institute

Sep. 2014 - June 2016

- Mentored 1 master student.

## PROFESSIONAL SERVICES

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### Served as reviewer of

- IEEE Robotics and Automation Letters
- International Conference on Robotics and Automation
- International Conference on Intelligent Robots and Systems
- IEEE-RAS International Conference on Humanoid Robots
- American Control Conference

## PUBLICATIONS

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### Journal Publication

- [1] **Luo, R.**, Hayne, R., & Berenson, D. (2018). Unsupervised early prediction of human reaching for human-robot collaboration in shared workspaces. *Autonomous Robots*, 42(3), 631-648.
- [2] Xu, J., Liu, S., Wan, A., Gao, B., Yi, Q., Zhao, D., **Luo, R.** & Chen, K. (2012). An absolute phase technique for 3D profile measurement using four-step structured light pattern. *Optics and Lasers in Engineering*, 50(9), 1274-1280.

### Manuscripts in Review (\* Equal contribution)

- [1] **Luo, R.\***, Weng, Y.\*, Wang, Y., Jayakumar, P., Brudnak, M. J., Paul, V., Desaraju, V. R., Stein, J. L., Ersal, T., & Yang, X. J. A Workload Adaptive Haptic Shared Control Scheme for Semi-Autonomous Driving. *Transactions On Human-Machine Systems*.
- [2] Weng, Y., **Luo, R.**, Jayakumar, P., Brudnak, M. J., Paul, V., Desaraju, V. R., Stein, J. L., Yang, X. J., & Ersal, T. Design and Human-in-the-Loop Evaluation of a Workload-Adaptive Haptic Shared Control Framework for Semi-Autonomous Driving. *ACC 2020*.

### Manuscripts in Preparation

- [1] **Luo, R.**, Du, N., Huang, K. Y., & Yang, X. J. Enhancing autonomy transparency: an option-centric rationale approach. *Journal of Cognitive Engineering and Decision Making*.

## Conference Proceedings (\* Equal contribution)

- [1] **Luo, R.\***, Wang, Y.\*, Weng, Y., Paul, V., Brudnak, M. J., Jayakumar, P., Reed, M., Stein, J. L., Ersal, T., & Yang, X. J. (2019). Toward Real-time Assessment of Workload: A Bayesian Inference Approach. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*.
- [2] **Luo, R.**, Du, N., Huang, K. Y., & Yang, X. J. (2019). Enhancing Transparency in Human-autonomy Teaming via the Option-centric Rationale Display. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*.
- [3] Hayne, R., **Luo, R.**, & Berenson, D. (2016, May). Considering avoidance and consistency in motion planning for human-robot manipulation in a shared workspace. In *2016 IEEE International Conference on Robotics and Automation (ICRA)* (pp. 3948-3954). IEEE.
- [4] **Luo, R.**, & Berenson, D. (2015, September). A framework for unsupervised online human reaching motion recognition and early prediction. In *2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* (pp. 2426-2433). IEEE.
- [5] **Luo, R.**, Chakraborty, N., & Sycara, K. (2014, October). Supervisory control for cost-effective redistribution of robotic swarms. In *2014 IEEE International Conference on Systems, Man, and Cybernetics (SMC)* (pp. 596-601). IEEE. (**Best student paper finalist**)

## Workshop and Poster Presentations (\* Equal contribution)

- [1] **Luo, R.**, Du, N., Huang, K. Y., & Yang, X. J. (2019). Enhancing autonomy transparency: an option-centric rationale approach. In *2019 Michigan AI Symposium*.
- [2] **Luo, R.**, Benge, S., Vasher, N., VanderVliet, G., Turner, J., Ghaffari, M. & Yang, X. J. (2019). Toward an Interactive Robot Docent: Estimating Museum Visitors' Comfort Level with Art. In *Robotics: Science and Systems Workshop 2019*.
- [3] **Luo, R.\***, Weng, Y.\*, Wang, Y., Jayakumar, P., Brudnak, M. J., Paul, V., Desaraju, V. R., Stein, J. L., Ersal, T., & Yang, X. J. (2019). Mutually-Adaptive Shared Control between Human Operators and Autonomy in Ground Vehicles. In *2019 Automotive Research Center Collaborative Research Seminar*
- [4] **Luo, R.**, & Berenson, D. (2017). Learning Controller Success Rate for an SE(2) Robot in Contact-Rich Environments. In *Robotics: Science and Systems Workshop 2017*.
- [5] **Luo, R.**, Hayne, R., & Berenson, D. (2016). Early prediction of human reaching motion for long-term human-robot collaboration. In *AI for Long-term Autonomy Workshop at ICRA 2016*.
- [6] **Luo, R.**, & Berenson, D. (2015). A Framework for Unsupervised Online Human Reaching Motion Recognition and Early Prediction. In *2015 New England Manipulation Symposium*.

## MEDIA COVERAGE

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- Michigan Radio Stateside, "Robot in the art museum", <http://www.tinyurl.com/y5hj4ns5> 2019.10
- University of Michigan Arts & Culture News, "U-M Museum of Art Brings Robots to the Art World", <https://tinyurl.com/y37n6l9x> 2019.10

## AWARDS AND HONORS

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- HFES Student Presenter Award 2019
- IROS NSF Travel Award 2015
- SMC Best Student Paper Finalist 2014

· SMC Student Travel Award	2014
· WPI RBE Fellowship	2014-2015
· 2nd/3rd Place RoboCup China Open Humanoid League	2009-2011
· Championship in the Penalty Contest of RoboCup China Open Humanoid League	2011
· 2nd Class Scholarship for Scientific and Academic Work, Tsinghua University	2011
· 3rd Class Scholarship for Scientific and Academic Work, Tsinghua University	2010
· 3rd Class Scholarship for Scientific and Academic Work, Tsinghua University	2010
· 1st Prize in 26th National College Student Physics Competition	2009
· 1st Prize in Chinese Physics Olympiad (Top1/6000 in theory part, Top3/6000 in total)	2007