

Ruitong Huang

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RESEARCH INTEREST

My research focuses on studying and designing provably efficient machine learning algorithms. The topics that I have worked on include Online Learning, Reinforcement Learning, Adversarial Learning/Robustness, and Statistical Learning Theory.

EXPERIENCES

Research Team Lead at Borealis AI Lab (RBC Research Institute) *Nov. 2017 - Aug. 2020*

- Leading a research team working on
 - Research topics: reinforcement learning, adversarial robustness, and online learning
 - Product projects: explainability and reinforcement learning for order execution
- Mentored interns: Jincheng Mei, Chenjun Xiao, Andjela Mladenovic, Kaiwen Wu.

Research intern at Borealis AI Lab (RBC Research Institute) *Jul. 2017 - Nov. 2017*

Research intern at Amazon Alexa *Summer 2015*

Mentors: Brian King, Roland Maas, & Sree Hari Krishnan Parthasarathi

EDUCATION

Ph.D. in Statistical Machine Learning, *University of Alberta* *Sep. 2010 - Sep. 2017*

Supervisors: Dale Schuurmans & Csaba Szepesvári

Master of Mathematics in Computer Science, *University of Waterloo* *Sept. 2008 - Jun. 2010*

Supervisor: Mark Giesbrecht

B.S. in Mathematics, *Univ. of Sci. and Tech. of China (USTC)* *Sept. 2004 - Jul. 2008*

Supervisor: Jun-Ming Xu

PUBLICATIONS

- Wu, K., Ding, G.W., **Huang, R.**, Yu, Y., *Towards minimax robust estimation via GANs*. International Conference on Artificial Intelligence and Statistics 2020 (AISTATS 2020).
- Ding, G.W., Sharma, Y., Lui, K., **Huang, R.**, *Max-margin adversarial (MMA) training: Direct input space margin maximization through adversarial training*. International Conference on Learning Representations 2020 (ICLR 2020).
- Xiao, C., Mei, J., **Huang, R.**, Schuurmans, D., Müller, M., *Maximum Entropy Monte-Carlo Planning*. In Advances in Neural Information Processing Systems 2019 (NIPS 2019).
- Mei, J., Xiao, C., **Huang, R.**, Schuurmans, D., Müller, M., *On principled entropy exploration in policy optimization*. In Proceedings of the 28th International Joint Conference on Artificial Intelligence 2019 (IJCAI 2019).
- Ding, G.W., Lui, K., Jin, X., Wang, L., **Huang, R.**, *On the sensitivity of adversarial robustness to input data distributions*. International Conference on Learning Representations 2019 (ICLR 2019).
- Lui K., Ding G.W., **Huang R.**, McCann R., *Dimensionality reduction has quantifiable imperfections: two geometric bounds*. Advances in Neural Information Processing Systems 2018 (NIPS 2018): 8453-8463.

- Cao, Y., Ding, G.W., Lui, K., **Huang, R.**, *Improving GAN training via binarized representation entropy (BRE) regularization*. International Conference on Learning Representations 2018 (ICLR 2018).
- **Huang, R.**, Ajallooeian, M.M., Szepesvári, C., Müller, M., *Structured Best Arm Identification with Fixed Confidence*. International Conference on Algorithmic Learning Theory 2017 (ALT 2017): 593-616.
- **Huang, R.**, Lattimore, T., György, A., Szepesvári, C., *Following the Leader and Fast Rates in Linear Prediction: Curved Constraint Sets and Other Regularities*. Advances in Neural Information Processing Systems 2016 (NIPS 2016).
 - Following the leader and fast rates in online linear prediction: Curved constraint sets and other regularities. The Journal of Machine Learning Research (JMLR), 18(1): 5325-5355.
- Maas, R., Parthasarathi, S. H. K., King, B., **Huang, R.**, and Hoffmeister, B. *Anchored Speech Detection*. Interspeech (2016): 2963-2967.
- Xu, B., **Huang, R.**, and Li, M., *Revise Saturated Activation Functions*. arXiv preprint arXiv:1602.05980 (2016).
- **Huang, R.**, Xu, B., Schuurmans, D., Szepesvári, C. *Learning with a Strong Adversary*. CoRR, abs/1511.03034 (2015).
- **Huang, R.**, György, A., Szepesvári, C. *Deterministic Independent Component Analysis*. International Conference on Machine Learning, 2015 (ICML 2015).
 - *Easy Data for Independent Component Analysis*. Workshop “Learning Faster from Easy Data II” in Neural Information Processing Systems 2015 (NIPS 2015).
- **Huang, R.**, Szepesvári, C. *A Finite-Sample Generalization Bound for Semiparametric Regression: Partially Linear Models*. The 17th International Conference on Artificial Intelligence and Statistics 2014 (AISTATS 2014): 402-410.
 - **Huang, R.**, Szepesvári, C. *Generalization Bounds for Partially Linear Models*. Special session on Theory of Machine Learning, International Symposium on Artificial Intelligence and Mathematics 2014 (ISAIM-2014).
- Zhang, X., Yu, Y., White, M., **Huang, R.** and Schuurmans, D. *Convex sparse coding, subspace learning, and semi-supervised extensions*. In Annual Conference on Artificial Intelligence (AAAI-2011), p567-573.

TALKS

- *Relaxing Statistical Assumptions in the Analyses of Learning Algorithms*. Amazon, Apr. 13th, 2017.
- *Fast Rates of Follow-the-Leader in Linear Prediction*. RBC research Lab, Mar. 1st, 2017.
- *Toward Understanding Adversarial Training*. OpenAI, Feb. 27th, 2017.
- *Fast Rates of Follow-the-Leader in Linear Prediction*. Univ. of Alberta, Aug. 20th, 2016.

AWARDS AND HONORS (SELECTED)

PhD outstanding thesis award (runner up)	2017
Outstanding Undergraduate Thesis Award, USTC (awarded to 3 students out of 75)	2008
National Scholarship (top 2%, honored by China Ministry of Education)	2007

SERVICES

- Reviewer:
 - Conferences: AISTATS, ICML, ALT, COLT, NIPS, IJCAI, ICLR, AAAI, ACML, UAI
 - Journals: Journal of Machine Learning Research, Annals of Applied Statistics, Machine Learning, Neurocomputing, Neural Networks