

Ruohan Wang, Ph.D

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EXPERIENCE

Senior Research Scientist

2021 – Present

*Institute for Infocomm Research, A*STAR*

- Principal investigator for CONMETA Project (\$230K grant) to study representation learning and knowledge transfer in large neural networks.
- Designed a novel continual learning algorithm with performance guarantees over arbitrary ordering of incoming data. Reduced accuracy variance to less than 2% and outperforms state-of-the-art by over 5%. Work presented as an invited talk at Google DeepMind.
- Designed a novel and unified representation model for heterogeneous tactile sensor data. Allows efficient knowledge transfer (50% reduction in training time) and improved accuracy (2 to 5%).
- Ongoing research includes building foundation models for genomics data and tabular prediction. Reworked the training pipeline to support PyTorch compilation and reduced training time from 2 weeks to 1.
- Managed 2 full-time staff and 4 student interns for CONMETA Project.

Postdoctoral Researcher

2020 – 2021

University College London

- Proposed a theoretical perspective on few-shot classification that unifies meta-learning and pre-training approaches. Improved accuracy (5 to 10%) with reduced training time (15 to 40%).

Applied Scientist Intern

2020

Amazon Web Services

- Designed a novel model ensemble algorithm based on hyperparameter optimization for AutoGluon, Amazon's Automated Machine Learning suite. Improves tabular prediction performance by 3 to 5% and reduces ensemble time by 10%.

Research Associate

2015 – 2016

*Institute for Infocomm Research, A*STAR*

- Developed two novel imitation learning algorithms for robot arm control. Improved trajectory accuracy by over 50% while maintaining the stability of the learned model as a dynamical system.

Software Engineer

2012 – 2014

Barclays

- Developed monitoring and deployment tools for trading systems. Created a user-friendly scripting system to automate system maintenance and update for operation. Replaced manual deployment with 70% time saving.
- Top performer for the Graduate Associate Training Program

EDUCATION

Imperial College London

2016 – 2020

Ph.D in Machine Learning

National University of Singapore

2008 – 2012

B.S. (First Class Honors) Computer Science

TECHNICAL SKILLS

Languages: Python, Java, C++, \LaTeX

Frameworks and Tools: PyTorch, Tensorflow, AWS tools, Unreal Engine, Git

AWARDS/HONORS

A*STAR Career Development Fund
Singapore National Science Scholarship
University Scholars Program President's Honor Roll
Undergraduate full scholarship
NUS Practicum Start-up Grant
National Olympiad in Informatics Silver Medal

ACADEMIC SERVICE

Area Chair: NeurIPS

Reviewer: IEEE PAMI, ACM HRI, IEEE RA-L, TMLR. NeurIPS, ICML, ICLR, AISTATS, ICRA, IROS

PUBLICATIONS

1. R Wang, M Ciccone, M Pontil, C Ciliberto, **Schedule-Robust Continual Learning**, under review for Transactions on Pattern Analysis and Machine Intelligence, 2024
2. R Wang, W Fu, C Ciliberto, **Deep Tabular Learning via Distillation and Language Guidance**, under review for Transactions on Machine Learning Research, 2024
3. R Wang, I Falk, M Pontil, C Ciliberto, **Robust Meta-Representation Learning via Global Label Inference and Classification**, Transactions on Pattern Analysis and Machine Intelligence, 2023
4. B Zandonati*, R Wang*, R Gao, Y Wu, **Investigating Vision Foundational Models for Tactile Representation Learning**, pre-print, 2022
5. R Wang, M Pontil, C Ciliberto, **The Role of Global Labels in Few-Shot Classification and How to Infer Them**, Conference on Neural Information Processing Systems 2021
6. PV Amadori, T Fischer, R Wang, Y Demiris **Predicting Secondary Task Performance: A Directly Actionable Metric for Cognitive Overload Detection**, IEEE Transactions on Cognitive and Developmental Systems 2021
7. R Wang, Y Demiris, C Ciliberto, **Structured Prediction for Conditional Meta-Learning**, Conference on Neural Information Processing Systems 2021
8. PV Amadori, T Fischer, R Wang, Y Demiris, **Decision Anticipation for Driving Assistance Systems**, International Conference on Intelligent Transportation Systems 2020
9. R Wang, C Ciliberto, PV Amadori, Y Demiris, **Random Expert Distillation: Imitation Learning via Expert Policy Support Estimation**, International Conference on Machine Learning 2019
10. R Wang, C Ciliberto, PV Amadori, Y Demiris, **Support-guided Adversarial Imitation Learning**, LIRE Workshop, Conference on Neural Information Processing Systems 2019
11. R Wang, PV Amadori, Y Demiris, **Real-Time Workload Classification during Driving using HyperNetworks**, International Conference on Intelligent Robots and Systems 2018
12. Y Wu, R Wang, LF D'Haro, RE Banchs, KP Tee **Multi-modal Robot Apprenticeship: Imitation Learning using Linearly Decayed DMP+ in a Human-Robot Dialogue System**, International Conference on Intelligent Robots and Systems 2018
13. R Wang, A Cully, HJ Chang, Y Demiris. **MAGAN: Margin Adaptation for Generative Adversarial Networks**, arXiv:1704.03817 2017
14. R Wang, Y Wu, WL Chan, KP Tee. **Dynamic Movement Primitives Plus: for Enhanced Reproduction Quality and Efficient Trajectory Modification Using Truncated Kernels and Local Biases**, International Conference on Intelligent Robots and Systems 2016