Muhammad Arrasy Rahman

Personal Information

Place and Date of Birth:	Banjarbaru, 22 December 1993
Nationality:	Indonesian
Address:	3401 Red River Street Apartment 244 78705, Austin
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GitHub:	https://github.com/raharrasy
Personal Webpage:	https://raharrasy.github.io

Education

OCT 2022 | **Doctor of Philosophy**
School of Informatics, University of Edinburgh
Thesis: *Advances in Open Ad Hoc Teamwork and Teammate Generation*
Supervisor: Dr. Stefano V. Albrecht
Funding: Edinburgh Enlightenment Scholarship, 4-year PhD Stipend

SEPT 2017 | **MSc in Data Science**
School of Informatics, University of Edinburgh
Grade: Distinction
Thesis: *Implementing Repeated Updates with Prioritized Experience Replay as Deep Reinforcement Learning Algorithms*
Supervisor: Dr. Henry Thompson
Funding: Indonesian Endowment Fund for Education Scholarship
Highlighted Courses: Machine Learning and Pattern Recognition, Probabilistic Modelling and Reasoning, Reinforcement Learning

JAN 2015 | **BSc in Computer Science**
Faculty of Computer Science, Universitas Indonesia
Grade: 3.85/4.00 (Top 5% of Class)
Thesis: *Weighted Ensemble Clustering using Self-Organizing Maps*
Supervisor: Denny, S.Kom, M.I.T., PhD
Funding: Samsung Indonesia Scholarship, 4-year BSc Stipend
Highlighted Courses: Linear Algebra, Statistics and Probability, Machine Learning, Information Theory

Work Experience

NOV 2022 - NOW | **Postdoctoral Research Fellow**
Learning Agents Research Group, UT Austin
As a research fellow under Professor Peter Stone's research group, my research interests encompass game theory, reinforcement learning, transfer learning and graph neural networks. I am specifically interested in their application in the ad hoc teamwork (AHT) problem, which explores techniques to create autonomous agents that can quickly adapt their policies to optimally interact with previously unseen teammate policies and team configurations.

APR 2021 - JUN 2021 | **Research Intern**
FiveAI

I was involved in developing a goal recognition algorithm for autonomous vehicles under partial observability based on inverse planning approaches. Our work was published at the 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2021).

OCT 2017-MAR 2018 | **Data Scientist**
Gojek

I was assigned to the allocation team responsible for building models to allocate drivers to customers and handle surge pricing. The main focus was building driver ranking models to ensure quality matching between drivers and customers.

SEPT 2015-APR 2016 | **Associate Data Scientist**
Traveloka

I was responsible for executing cluster analysis to find insights on churning customers. The resulting insights about churning customers are then used to develop prediction models to predict potentially churning customers. I also created a simple supervised learning model to detect transactions from bots to prevent them from providing noise to conversion rate data. Finally, I also explored several frameworks to build a solid data science pipeline.

PUBLICATION HISTORY

Minimum Coverage Sets for Training Robust Ad Hoc Teamwork Agents
Arrasy Rahman, Jiaxun Cui, Peter Stone
arXiv preprint arXiv:2308.09595 (2023).

A General Learning Framework for Open Ad Hoc Teamwork Using Graph-based Policy Learning
Arrasy Rahman, Ignacio Carlucho, Niklas Hopner and Stefano V. Albrecht
Journal of Machine Learning Research

Generating Teammates for Training Robust Ad Hoc Teamwork Agents via Best-Response Diversity
Arrasy Rahman, Elliot Fosong, Ignacio Carlucho and Stefano V. Albrecht
Transactions on Machine Learning Research

A survey of Ad Hoc Teamwork: Definitions, Methods, and Open Problems
Reuth Mirsky, Ignacio Carlucho, **Arrasy Rahman**, Elliot Fosong, William Macke, Mohan Sridharan, Peter Stone, Stefano V. Albrecht
The 19th European Conference on Multi-Agent Systems - EUMAS 2022

Towards Robust Ad Hoc Teamwork Agents By Creating Diverse Training Teammates
Arrasy Rahman, Elliot Fosong, Ignacio Carlucho and Stefano V. Albrecht
Workshop on Ad Hoc Teamwork (WAHT 2022) - IJCAI 2022

Cooperative Marine Operations via Ad Hoc Teams
Ignacio Carlucho, **Arrasy Rahman**, William Ard, Elliot Fosong, Corina Barbalata, and Stefano V. Albrecht
Workshop on Ad Hoc Teamwork (WAHT 2022) - IJCAI 2022

Interpretable Goal Recognition in the Presence of Occluded Factors for Autonomous Vehicles
Josiah P. Hanna, **Arrasy Rahman**, Elliot Fosong, Francisco Eiras, Mihai Dobre, John Redford, Subramanian Ramamoorthy, Stefano V. Albrecht
2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2021)

Towards Open Ad Hoc Teamwork using Graph-based Policy Learning

Arrasy Rahman, Niklas Hopner, Filippos Christianos, Stefano Albrecht
Proceedings of the 38th International Conference on Machine Learning (ICML 2021)

Scaling Multi-Agent Reinforcement Learning with Selective Parameter Sharing
Filippos Christianos, Georgios Papoudakis, **Arrasy Rahman**, Stefano Albrecht
Proceedings of the 38th International Conference on Machine Learning (ICML 2021)

Towards Open Ad Hoc Teamwork using Graph-based Policy Learning
Arrasy Rahman, Niklas Hopner, Filippos Christianos, Stefano Albrecht
Adaptive and Learning Agents Workshop (ALA) at AAMAS 2021

Dealing with Non-Stationarity in Multi-Agent Deep Reinforcement Learning
Georgios Papoudakis, Filippos Christianos, **Arrasy Rahman**, Stefano Albrecht
arXiv preprint arXiv:1906.04737 (2019).

Skills

Machine Learning:	**Ad Hoc Teamwork, Zero-shot Coordination, Agent Modelling, (Multiagent) Deep Reinforcement Learning, Graph Neural Networks, Deep Learning, Probabilistic Graphical Models**
Programming:	**Pytorch, Tensorflow, Pytorch Geometric, Deep Graph Library, Python, Java**

Teaching Experience

JAN 2019-MAY 2020

Teaching Support Provider
University of Edinburgh

I worked as a teaching assistant, tutor, demonstrator and marker for the 2018/2019 and 2019/2020 reinforcement learning courses. My responsibilities include:

- Creating lecture slides.
- Delivering lectures.
- Designing homework assignments and its solution.
- Moderating discussions during tutorials and office hours.

My work as a teaching support provider was finally recognised with the Edinburgh Teaching Award.

Awards

Oct 2022	**NeurIPS 2022 Top Reviewers**
Jul 2022	**ICML 2022 Best Reviewers (Top 10%) Recognition**
May 2021	**Best Paper Runner Up at ALA 2021**
Jan 2021	**Edinburgh Teaching Award**
Dec 2019	**4th Place in Huawei UK's Autonomous Vehicles Challenge**
Sept 2017	**2017 Informatics Class Prize for Top Performance in the MSc Data Science Programme**

Professional Activities

2023 | **Reviewer**, AAMAS 2023, ICML 2023, NeurIPS 2023, ECAI 2023, AAAI 2024, ICLR 2024
Program Committee Member, ALA 2023 Workshop at AAMAS 2023

2022 | **Reviewer**, AAMAS 2022, AAMAS Journal, ICML 2022, NeurIPS 2022, AAAI 2023
Organizing Committee Member, WAHT 2022 Workshop at IJCAI 2022
Program Committee Member, ALA 2022 Workshop at AAMAS 2022