

RAJA FARRUKH ALI

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RESEARCH INTERESTS

PhD candidate in Computer Science with research interests spanning Reinforcement Learning, Modeling Human Preferences and AI Alignment. Skilled in developing and applying algorithms that capture human preferences and different reward discounting treatments.

EDUCATION

Kansas State University, Manhattan KS Ph.D. Candidate in Computer Science Advisor: William Hsu	2018 - Present
National University of Sciences & Technology, Islamabad M.S. in Computer & Communication Security Thesis: Load dependent dynamic path selection in hybrid wireless mesh networks Advisor: Adnan Kiani	2010 - 2014
National University of Sciences & Technology, Islamabad B.E. in Avionics Engineering Research Project: Evaluating the effects of static channel allocation in wireless networks Advisor: Asad Pirzada	2005 - 2009

RELEVANT PUBLICATIONS

NM Nafi, **RF Ali**, W Hsu, K Duong, M Vick, *Policy Optimization using Horizon Regularized Advantage to Improve Generalization in Reinforcement Learning*, AAMAS 2024.

RF Ali, A Farooq, E Adeniji, J Woods, V Sun, W Hsu, *Explainable Reinforcement Learning for Alzheimer's Disease Progression Prediction*, XAI in Action Workshop, NeurIPS 2023

RF Ali, *Non-Exponential Reward Discounting in Reinforcement Learning*, 28th AAAI/SIGAI Doctoral Consortium, AAAI 2023.

RF Ali, K Duong, NM Nafi, W Hsu, *Multi-Horizon Learning in Procedurally-Generated Environments for Off-Policy Reinforcement Learning*, AAAI 2023.

RF Ali, NM Nafi, K Duong, W Hsu, *Efficient Multi-Horizon Learning for Off-Policy Reinforcement Learning*, Deep Reinforcement Learning Workshop, NeurIPS 2022.

NM Nafi, **RF Ali**, W Hsu, *Analyzing the Sensitivity to Policy-Value Decoupling in Deep Reinforcement Learning Generalization*, Deep Reinforcement Learning Workshop, NeurIPS 2022. Also accepted to AAMAS 2023 (Extended Abstract)

NM Nafi, **RF Ali**, WH Hsu, *Hyperbolically Discounted Advantage Estimation for Generalization in Reinforcement Learning*, Workshop on Decision Awareness in Reinforcement Learning, ICML 2022.

PROGRAM PARTICIPATION

<i>Attended</i> CIFAR Deep Learning Reinforcement Learning (DLRL) Summer School	2022
<i>Attended</i> Oxford Machine Learning (OxML) Summer School	2022
<i>Attended</i> Kansas State Graduate Student Leadership Development Program	2019

WORK EXPERIENCE

Kansas State Lab for Knowledge Discovery in Databases (KDD) August 2019 - Present
Graduate Research Assistant *Manhattan, KS*

- Co-leading the RL division (06 students) and leading the interdisciplinary outreach, funding opportunities, and grant preparation efforts for the lab, in addition to research responsibilities.

Avionics Production Factory November 2009 - July 2018
Software and Systems Engineer *Kamra, Punjab*

- Worked as part of a team on software development of mission and safety-critical avionics systems. Carried out requirement analysis and detailed design at both the system and software levels. Developed software using RTOS and tested hardware-software integration through simulators. Participated in successful development and qualification of 5 avionics integration projects.
- Developed a software test rig for an avionics activation system. Performed functional testing of the system by verifying bus communication protocol and participated in its flight qualification.

TEACHING

Graduate Teaching Assistant, Kansas State University Aug 2018 - Dec 2021

CC-110 Introduction to Computer Science	F20, S21, F21
CC-210 Fundamental Computer Programming Concepts	S20, F20, S21, F21
CC-310 Data Structures & Algorithms I	S20
CS-308 Advanced C Language	F19
CS-209 C Language for Engineers	F18, S19

SERVICE

Student Volunteer, NeurIPS	2022, 2023
Co-Chair, AI Diversity Belonging Equity and Inclusion (AIDBEI) Workshop, AAMAS	2022
Founder & President, Kansas State Computer Science Graduate Student Association	2019

MENTORING

Supervised 10 undergraduate research students since 2020. The supervision has produced one AAAI abstract, one AAAI workshop and two NeurIPS workshop papers. One nominee was awarded University Award for Distinguished Undergraduate Student in Research.

HONORS & AWARDS

AAAI Student Scholarship	2023
Kansas State Graduate Student Council Travel Award	2022, 2023
Offered HEC Scholarship for 5-year PhD program in the US	2018
Silver Medal , Avionics System Design Competition, NUST	2009
Distinction Award , in 4 out of 8 semesters during undergraduate studies, NUST	2005-09

TECHNICAL SKILLS

Computer Languages	Python, C/C++
ML/RL Libraries	TensorFlow, PyTorch, JAX, RLlib, Stable Baselines, Dopamine
RL Environments	Gym, ALE, Progen, PettingZoo, SMAC, Crafter
Tools	MATLAB, LabVIEW, LaTeX, Git, Docker

INTERESTS

Aviation, Technology, Entrepreneurship, Soccer, Skydiving