

Nasik Muhammad Nafi

✉ nafi@ksu.edu

☎ 469-929-5323

🐙 NasikNafi

🐦 @NasikNafi

🌐 NasikNafi

🌐 <https://scholar.google.com/citations?user=H1s1JWUAAAJ>

🌐 <https://nasiknafi.github.io/>

Research Summary

My research interest lies in the intersection of Deep Reinforcement Learning and Computer Vision, aiming to develop adaptable agents capable of excelling in zero-shot generalization. I advocate for effective representation learning, neural architecture design, and uncertainty modelling to unlock the potential of intelligent agents in complex, diverse, and dynamic real-world scenarios. I explore through the delicate balance between theoretical and experimental methods. As a researcher and educator, my overarching aim is to foster an environment of accessibility and inclusivity within the realm of computing and actively contribute to pioneering research initiatives.

Education

- 2019 – Present **Ph.D. Candidate in Computer Science**
Kansas State University, Manhattan, KS.
Advisor: *Dr. William H. Hsu*
Expected dissertation title: *Representation Learning and Uncertainty Modelling for Generalization in Reinforcement Learning.*
- 2017 – 2019 **M.Sc. in Computer Science**
Kansas State University, Manhattan, KS.
Thesis title: *Generative versus Sampling-Based Approaches to Variability of Class Imbalance in Visual Anomaly Detection.*
- 2010 – 2015 **B.Sc. in Computer Science and Engineering**
Bangladesh University of Engineering and Technology (BUET), Bangladesh.

Professional Experience

- | | |
|---|----------------------|
| Graduate Research Assistant
<i>Knowledge Discovery in Databases (KDD) Lab, Kansas State University.</i> | Jan 2021 – Present |
| Machine Learning Engineer Intern
<i>DEKA Research and Development, Manchester, NH</i> | May 2023 – Aug 2023 |
| Graduate Teaching Assistant
<i>Department of Computer Science, Kansas State University.</i> | Aug 2018 – Dec 2020 |
| Data Scientist Intern
<i>C2FO, Leawood, KS</i> | June 2018 – Aug 2018 |
| Graduate Research Assistant
<i>Secure It, I Research Group, Kansas State University.</i> | Aug 2017 – May 2018 |
| Software Engineer
<i>REVE Systems Ltd., Dhaka, Bangladesh.</i> | Oct 2015 – Oct 2016 |
| Part-time Software Engineer
<i>TechnoTreeBD Ltd., Dhaka, Bangladesh.</i> | May 2015 – Aug 2015 |

Research Publications

Peer-Reviewed Conference Papers

- C1 **Nafi, N.M.**, Poggi-Corradini, G. and Hsu, W. (2023). "Policy Optimization with Augmented Value Targets for Generalization in Reinforcement Learning." in *2023 International Joint Conference on Neural Networks (IJCNN)*.
- C2 **Nafi, N.M.**, Ali, R.F. and Hsu, W. (2023). "Analyzing the Sensitivity to Policy-Value Decoupling in Deep Reinforcement Learning Generalization." in *22nd International Conference on Autonomous Agents and Multi-Agent System (AAMAS)*.
- C3 **Nafi, N.M.**, Rediger, A., Dietrich, S. and Hsu, W. (2023). "Relevant Instance Segmentation in American Football Practice Images to Aid Risky Tackle Detection." in *IEEE 22nd International Conference on Machine Learning and Applications (ICMLA)*.
- C4 Ali, R.F., Duong, K., **Nafi, N.M.** and Hsu, W. (2023). "Multi-Horizon Learning in Procedurally-Generated Environments for Off Policy Reinforcement Learning (Student Abstract)." in *AAAI Conference on Artificial Intelligence*.
- C5 **Nafi, N.M.**, Glasscock, C. and Hsu, W. (2022). "Attention-based Partial Decoupling of Policy and Value for Generalization in Reinforcement Learning." in *IEEE 21st International Conference on Machine Learning and Applications (ICMLA)*.
- C6 **Nafi, N.M.**, Dietrich, S. and Hsu, W. (2022). "Risky Tackle Detection from American Football Practice Videos using 3D Convolutional Networks." in *18th International Conference on Machine Learning and Data Mining (MLDM)*.
- C7 Okerinde, A., Hsu, W., Theis, T., **Nafi, N.M.**, and Shamir, L. (2021). "eGAN: Unsupervised Approach to Class Imbalance using Transfer Learning." in *19th International Conference on Computer Analysis of Images and Patterns (CAIP)*.
- C8 **Nafi, N.M.** and Hsu, W.H. (2020). "Addressing Class Imbalance in Image-Based Plant Disease Detection: Deep Generative vs. Sampling-Based Approaches." in *27th International Conference on Systems, Signals and Image Processing (IWSSIP)*. **[Best Paper Award.]**
- C9 **Nafi, N.M.**, Bose, A., Khanal, S., Caragea, D. and Hsu, W.H. (2020). "Abstractive Text Summarization of Disaster-Related Documents." in *17th International Conference on Information Systems for Crisis Response and Management (ISCRAM)*.

Research Publications (continued)

Peer-Reviewed Workshop Papers

- W1 **Nafi, N.M.**, and Hsu, W. (2023). "Reinforcement Learning with Augmentation Invariant Representation: A Non-contrastive Approach." in *Generalization in Planning (GenPlan) Workshop at International Conference on Neural Information Processing Systems (NeurIPS)*.
- W2 **Nafi, N.M.** and Hsu, W. (2023). "MetaVHAR: Meta-Learning for Video-Based Human Activity Recognition." in *AAAI Workshop on User-Centric Artificial Intelligence for Assistance in At-Home Tasks*.
- W3 **Nafi, N.M.**, Ali, R.F. and Hsu, W. (2022). "Analyzing the Sensitivity to Policy-Value Decoupling in Deep Reinforcement Learning Generalization." in *Deep Reinforcement Learning (DRL) Workshop at International Conference on Neural Information Processing Systems (NeurIPS)*.
- W4 **Nafi, N.M.**, Ali, R.F. and Hsu, W. (2022). "Hyperbolically Discounted Advantage Estimation for Generalization in Reinforcement Learning." in *Decision Awareness in Reinforcement Learning (DARL) Workshop at International Conference on Machine Learning (ICML)*.
- W5 Ali, R.F., **Nafi, N.M.**, Duong, K. and Hsu, W. (2022). "Efficient Multi-Horizon Learning for Off-Policy Reinforcement Learning." in *Deep RL Workshop at International Conference on Neural Information Processing Systems (NeurIPS)*.
- W6 **Nafi, N.M.**, Glasscock, C. and Hsu, W. (2021). "Attention-based Partial Decoupling of Policy and Value for Generalization in Reinforcement Learning." in *Deep Reinforcement Learning Workshop at International Conference on Neural Information Processing Systems (NeurIPS)*.

Doctoral Consortium

- D1 **Nafi, N.M.** (2023). "Learning Representations and Robust Exploration for Improved Generalization in Reinforcement Learning." in *2023 International Conference on Autonomous Agents and Multiagent Systems*.

Skills

Programming Languages	Python, C, C++, Java, SQL, PHP, R, SML, Racket, Prolog.
Machine Learning Frameworks	PyTorch, TensorFlow, Keras, Scikit-learn.
Reinforcement Learning Libraries	Garage, RLlib, OpenAI Baselines, Stable Baselines.
Web Development	HTML, CSS, JavaScript, Apache Web Server.
Operating Systems	Unix, Linux, Mac OSX, Windows, Android.
Miscellaneous	OpenAI Gym, OpenCV, Gensim, NLTK, Bash, Git, Docker, Android Studio, Microsoft Visual Studio, \LaTeX .

Honors and Awards

Awards and Achievements

- 2023 **Outstanding Graduate Student**, Carl R. Ice College of Engineering, Kansas State University. (Link to K-State Announcement)
- 2020 **Best Paper Award**, 27th IEEE International Conference on Systems, Signals and Image Processing. (Link to IEEE IWSSIP Proceedings)
- 2018 **Special Recognition**, by Google Android Security Awards Program. Secondary developer of the winning team. (Link to K-State Announcement)
- 2015 **Best Poster-papers Award**, 2nd Undergraduate Thesis Poster Presentation, BUET. Awarded to top 15, sponsored by Higher Education Quality Enhancement Project (HEQEP).

Travel Grants

- 2023 **Graduate Student Council Travel Award** to attend ICMLA 2023, NeurIPS 2023.
- 2023 **Department of CS Travel Grant** to attend IEEE IJCNN 2023.
- 2022 **Department of CS Travel Grant** to attend IEEE ICMLA 2022.
- 2022 **Graduate Student Council Travel Award** to attend MLDM 2022, ICMLA 2022.
- 2022 **DeepMind Travel Grant** to attend DARL workshop at ICML 2022.
- 2021 **Graduate Student Council Travel Award** to attend DRL workshop, NeurIPS 2021.
- 2020 **Graduate Student Council Travel Award** to attend IWSSIP 2020.

Scholarships

- 2021 **International Student Scholarship**, Kansas State University Alumni Association.
- 2017-2023 **Graduate Research/Teaching Assistantship with full tuition waiver**, Kansas State University.
- 2010-2014 **Technical Scholarship** for academic excellence in all undergraduate years at Bangladesh University of Engineering and Technology (BUET).
- 2008-2009 **Bangladesh Government Education Board's Scholarship**. Awarded to top performing students in Secondary School Certificate Examination.
- 2005-2006 **Bangladesh Government Education Board's Scholarship**. Awarded for outstanding performance in Junior Scholarship Examination.

Research Community Services

Program Committee / Co-Chair

- 2023 Session Chair, International Joint Conference on Neural Networks (IJCNN).
- 2022 5th Artificial Intelligence - Diversity, Belonging, Equity, and Inclusion (AIDBEI) workshop at IJCAI 2022.
- 2022 4th Artificial Intelligence - Diversity, Belonging, Equity, and Inclusion (AIDBEI) workshop at AAMAS 2022.

Research Community Services (continued)

Reviewer

- 2023 Unifying Representations in Neural Models Workshop at NeurIPS 2023. Reviewed: 2
- 2022 8th Deep Reinforcement Learning (DRL) Workshop at NeurIPS 2022. Reviewed: 5
- 2022 International Conference on Automated Machine Learning, 2022. Reviewed: 2
- 2022 AIDBEI Workshops at AAMAS and IJCAI 2022. Reviewed: 4
- 2022 Artificial Intelligence Review Journal. Reviewed: 1
- 2021 Meta-Learning Workshop at NeurIPS 2021. Reviewed: 3

Activities

Leadership

- 2021–2022 **President**, Computer Science Graduate Student Association, K-State.
- 2020–2021 **Secretary**, Computer Science Graduate Student Association, K-State.
- 2015 **Organizer**, Voice of Visuals, International Photography Exhibition.
- 2015 **Organizer**, Annual Festival of Computer Science Department, BUET.
- 2014–2015 **President**, Greater Rangpur Students' Welfare Association, BUET.
- 2014–2015 **Treasurer**, BUET Photographic Society (BUETPS).
- 2014–2015 **Mentor**, Bangladesh Science Outreach (BSO).
- 2014–2015 **Volunteer**, Life Carnival Foundation.

Certification

- 2022 **Graduate Student Leadership Development Program.**
Staley School of Leadership Studies, Kansas State University.
- 2013 **LOOP: A Workshop on Basic Photography.**
Organized by BUET Photographic Society.

Affiliations

- 2017–2021 **Member**, Bangladeshi Students' Association, Kansas State University.
- 2019–2020 **Member**, K-State ACM Special Interest Group in Artificial Intelligence (SIGAI).
- 2018–2020 **Member**, K-State Robotics Competition Team (KSURCT).