Aayam K. Shrestha

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NEWS: *I successfully defended my PhD in Computer Science in December 2024 - Currently working as a postdoctoral researcher with my PhD advisor as I transition to industry.*

About Me: *I enjoy solving complex AI problems through principled approaches. I am looking to join a team working towards developing sustainable and aligned AI systems with real-world impact.*

Research Overview

My research lies at the intersection of high-level reasoning and low-level control in AI systems, with a focus on building plannable representations for motion control of simulated characters and robots. I am particularly interested in applying my core RL background to digital humans and humanoid robot behaviors, enabling them to better reason and act in both virtual and real-world 3D environments.

Research Interests: Reinforcement Learning, Simulated Character control, Symbolic Planning, Robotics, Knowledge Graphs.

Education

- **Ph.D. in Computer Science, Oregon State University** [Thesis]
  Advisor: Alan Fern — *Sept. 2018 – Dec. 2024*
- **B.S. in Computer Engineering, Tribhuvan University**
  Valedictorian — *Aug. 2012 – Apr. 2016*

Publications

1. Learning Multi-Modal Whole-Body Control for Real World Humanoid Robots
   Pranay Dugar, **Aayam Shrestha**, Fangzhou Yu, Alan Fern. - *Under Submission ICRA 2025* — [Project Page]
2. Learning Reconfigurable Multi-Biped Rigid Body Transport
   Bikram Pandit, Ashutosh Gupta, **Aayam Shrestha**, Addie, Alan Fern. - *CORL 2024* — [Project Page]
3. Generating Physically Realistic and Directable Human Motions from Multi-Modal Inputs
   Aayam Shrestha*, Pan Liu*, Kai Yuan, German Ros, Alan Fern. - *ECCV 2024* — [Project Page]
4. Revisiting Reward Design and Evaluation for Robust Humanoid Walking
   Bart van Marum, **Aayam Shrestha**, Helei Duan, Alan Fern. - *IROS 2024* — [Project Page]
5. Fatored Reward Design for Page Level Widget Recommendation System
   Aayam Shrestha, Kai Yuan. - *AMLC RL Workshop 2021*
6. DeepAveragers: Offline Reinforcement Learning by Solving Derived Non-Parametric MDPs
   Aayam Shrestha, Stefan Lee, Prasad Tadepalli and Alan Fern. - *ICLR 2021* . — [Project Page]
7. Structural Generalizability: The Case of Similarity Search
   Yodsawalai C., Arash T., Stephen A. R., **Aayam Shrestha**, Amy Glen, Zheng Liu - *SIGMOD 2021.* [arXiv]

Experience

- **Reality Labs, Meta** — Los Angeles, CA
  Software Engineering Intern (AI/ML Specialist) — *June 2022 - Sept. 2022*
  - **Project**: Designed and implemented Upselling Module for Oculus Store. *Deployed in production.(Fall 2023)*
  - **Benchmark Results**: The Averagers recommendation module extends model support for items, consummables as well as bundles for upselling. Offline evaluation demonstrated *150%* improvement on suggested purchase conversion over KNN baseline.
  - **Research**: User Journey Dataset/Modelling for in-app purchases across oculus store. Scraped and created a dataset for users journey (sequence of interactions) in order to gain insights for third party applications such as push notifications and recommendations.

- **Amazon** Seattle, WA
  Applied Scientist Intern *June 2021 - Sept. 2021*
  - **Project**: Designed and Implemented Page Level Reward for Cross-Slot Widget Ranking.
  - **Benchmark Results**: New reward prediction model increased prediction accuration by *300%* over baselines, *50%* improvement for overall business metric predictions - across different world regions.
- **Logic Information Systems.** Blommington, MN
  Business Intelligence Engineer *May 2016 - Aug. 2018*
  - **Project**: Developed and maintained large-scale enterprise Data Warehousing and Business Intelligence solutions.
  - **BI Consulting**: Off-shore consulting for clients Alex & Ani, Holland and Barett, Gander Mountain, and Makro.
  - **Research**: Customer Experience Analytics over in-house data lake comprising customer call audio, text reviews, and curated twitter feeds.

Professional

- **Invited Talks**
  - *Deep Non-Parametric Abstractions of Markov Decision Processes.*
    - Microsoft Research, NYC. (2024) — slides
  - *The Masked Humanoid Controller for Natural Imitation of Human Behaviors.*
    - NW Robotics Symposium, Corvallis. (2024) — slides
- **Reviewing**
  - Neural Information Processing Systems (NeurIPS). (2021, 2022, 2023)
  - International Conference of Representation Learning (ICLR). (2022, 2023, 2024, 2025)
  - Internationl Conference of Machine learning (ICML). (2021, 2022, 2023, 2024)
  - AAAI Conference on Artificial Intelligence (AAAI). (2023, 2024, 2025)
  - International Conference on Intelligent Robots and Systems (IROS). (2024)
  - Workshop on Reinforcement Learning Ready for Production (AAAI). (2023)

Select Projects

- **Clean VI**: Hardware optimized single file implementations of Value Iteration for all popular frameworks.
- **Obj2Obj GAN** : Masked Image to Image translation using GANs for object inpainting. (2018)