Gaurav Dixit

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Education

Ph.D. Candidate in Robotics
2020 - Present
Expected Graduation August, 2023

Oregon State University, Corvallis OR 97331
Advised by Dr. Kagan Tumer. Researching methods for learning cooperative and competitive strategies in asymmetric multiagent problems

Masters in Computer Science
2018 - 2020

Oregon State University, Corvallis OR 97331
Advised by Kagan Tumer

Honors B.Eng., *magna cum laude*
2016

University of Pune, Pune IN 411043
Honors Bachelor of Engineering in Computer Science, Pune Institute Of Computer Technology, 3.81 GPA

Skills and Interests

- Research in distributed multiagent control, diversity search and team balancing for cooperative problems. Application of aleatoric computational models to creative mediums
- In-depth knowledge and experience with C/C++, Eigen, PyTorch, Pagmo, Python, GNU/Linux

Experience

Collaborative Robotics and Intelligent Systems Institute Corvallis, OR
Graduate Research Assistant November 2018 – Present

- Develop methods for addressing reward sparsity and credit assignment problems in multiagent settings that require a high degree of inter-agent coordination.
- Design diversity search methods for improving zero-shot generalization to changes in task dynamics, agent policies and team composition.

C37 Collective Helsinki, FI
Applied AI - Artist Researcher July 2022 – Present

- Investigate the application of computational and evolutionary techniques as an aid in creating aleatoric temporal art forms (music).
- Design tools for multi-modal visualization of the transformation of input as it is subjected to generative models.

RedLynx Oy Helsinki, FI
Research Engineer - AI June 2019 – September 2020

- Investigated the confluence of traditional tree-based planning and reinforcement learning for adversarial zero-sum games.
- Improved Quality-Diversity methods for automated inference of latent spaces which can be used as proxies for a behavior space of policies

Ubisoft Entertainment SA Pune, In / Helsinki, FI
AI / Physics Programmer August 2016 – June 2018

- Implemented policy gradient and evolutionary methods to build an end-to-end pipeline for automated game testing.
- Designed and developed a web-first rigid body physics engine in TypeScript and Node.js for building online simulators.

BMC Software Pune, In
Software Development Research Intern August 2015 – August 2016

- Developed an event analysis tool for root cause analysis and mining event associations using a variation of the Rete algorithm for real-time analysis of network events for the network automation team.

Pune Institute of Computer Technology Pune, In
Undergraduate Research Assistant August 2014 – August 2016

- Compiled data and developed new methods to improve Named-entity recognition for Hindi and its dialects.

Teaching Assistant: Machine Learning and Data Mining (spring 15), Data Structures and Algorithms (fall 15), Programming Paradigms and Generics in C/C++ (fall 14), Operating System Administration (spring 13), Introduction to Functional Programming with Haskell (fall 13)

Academic Service

- PC for the 22nd International Conference on Autonomous Agents and Multiagent Systems, AAMAS (ALA) 2023.
- Reviewer for IEEE Transactions on Evolutionary Computation, 2023.
- Reviewer for the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2022, 2023.
- Reviewer for the Genetic and Evolutionary Computation Conference (GECCO), 2022, 2023.

Publications

Dixit, G., and Tumer, K. Learning synergies for multi-objective optimization in asymmetric multiagent systems. In *Proceedings of the Genetic and Evolutionary Computation Conference* (2023)

Dixit, G., and Tumer, K. Learning inter-agent synergies in asymmetric multiagent systems. In *Proceedings of the 22nd International Conference on Autonomous Agents and Multiagent Systems* (2023)

Dixit, G., and Tumer, K. Behavior exploration and team balancing for heterogeneous multiagent coordination. In *Proceedings of the 21st International Conference on Autonomous Agents and Multiagent Systems* (2022), pp. 1578–1579

Dixit, G., Gonzalez, E., and Tumer, K. Diversifying behaviors for learning in asymmetric multiagent systems. In *Proceedings of the Genetic and Evolutionary Computation Conference* (2022)

Olson, M. L., Nguyen, T.-V., Dixit, G., Ratzlaff, N., Wong, W.-K., and Kahng, M. Contrastive identification of covariate shift in image data. In *2021 IEEE Visualization Conference (VIS)* (2021), IEEE, pp. 36–40

Dixit, G., Koll, C., and Tumer, K. Heterogeneous agent coordination via adaptive quality diversity and specialization. In *Proceedings of the Genetic and Evolutionary Computation Conference Companion* (2021), pp. 95–96

Dixit, G., Zerbel, N., and Tumer, K. Gaussian processes as multiagent reward models. In *Proceedings of the 19nd International Conference on Autonomous Agents and Multiagent Systems* (2020)

Dixit, G., Zerbel, N., and Tumer, K. Dirichlet-multinomial counterfactual rewards for heterogeneous multiagent systems. In *2019 International Symposium on Multi-Robot and Multi-Agent Systems (MRS)* (2019), IEEE, pp. 209–215