Devendra R. Parkar

Personal Information

Devendra Rajendra Parkar
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Education

Ph.D. Computer Science Arizona State University, Tempe, Arizona, USA *(Expected) May 2029*
Advisor. Prof. Joshua Daymude
GPA 3.92/4.00

M.S. Computer Science Arizona State University, Tempe, Arizona, USA *May 2024*
Thesis. Evolving Stochastic Algorithms for Self-Organizing Particle Systems
Advisor. Prof. Joshua Daymude
GPA 3.92/4.00

B.E. Computer Engineering University of Mumbai, Mumbai, India *May 2018*
Bachelors Thesis. Simulation of Autonomous Swarm Behavior
Advisor. Prof. Jayant Gadge
GPA 7.96/10

Publications

Jamison Weber, Dhanush Giriyan, **Devendra Parkar**, Andréa Richa, Dimitri Bertsekas, *Distributed Online Rollout for Multivehicle Routing in Unmapped Environments*, Proceedings of the 23rd International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2024), https://dl.acm.org/doi/10.5555/3635637.3663054

Kaustuv Mukherji*, **Devendra Parkar***, Lahari Pokala, Dyuman Aditya, Paulo Shakarian, Clark Dorman, *Scalable Semantic Non-Markovian Simulation Proxy for Reinforcement Learning*, IEEE 18th International Conference on Semantic Computing (ICSC 2024), https://doi.org/10.1109/ICSC59802.2024.00035 *contributed equally

Devendra Parkar, Joshua Daymude, Raylene Faerber, Kirtus Leyba, *Evolving Collective Behaviors in Self-Organizing Particle Systems*, Proceedings of the 2024 Artificial Life Conference (ALIFE 2024), https://doi.org/10.1162/isal_a_00754

Divyagna Bavikadi, Dyuman Aditya, **Devendra Parkar**, Paulo Shakarian, Graham Mueller, Chad Parvis, Gerardo I. Simari, *Geospatial Trajectory Generation via Efficient Abduction: Deployment for Independent Testing*, 40th International Conference on Logic Programming (ICLP 2024) [Accepted], https://doi.org/10.48550/arXiv.2407.06447

Presentations

Devendra Parkar, Vaibhav Panchal, Prem Bhat and Rishi Shah, *Efficient Energy Management System for Indian households*, [Short-paper presentation] International Conference and Workshop on Electronics and Telecommunication Engineering at Thakur College of Engineering and Technology (ICWET 2015)

Research Experience

Research Assistant under Prof. Joshua Daymude(ASU) *Sep 2022 - Present*
Project: *Evolving Stochastic Algorithms for Self-Organizing Particle Systems*
- Developed a framework to achieve (global) collective behaviors of Aggregation, Separation, Flocking and Object Coating by learning (local) agent rules using bio-inspired optimization - **Genetic Algorithms**

Graduate Service Assistant under Prof. Paulo Shakarian(ASU) *May 2023 - May 2024*
Project: *IARPA HAYSTACK - Movement Generation (in collaboration with Leidos Inc.)*
- Contributed to a framework for constrained optimization of agent trajectory in knowledge infused graphs using heuristic based graph traversal algorithms - **A* search** (**NetworkX**)

Project: *PyReason-Gym simulations for Symbolic Reinforcement Learning*
- Designed a new **Deep-Q-Net** (**PyTorch**) based algorithm to handle non-markovian temporal dynamics and learn interpretable policies for agents in PyReason-Gym simulator
- Successfully demonstrated transfer of interpretable policies learnt in PyReason-Gym on PySC-II and AFSIM simulators

Research Assistant under Prof. Andréa Richa(ASU), Prof. Dimitri Bertsekas(ASU/MIT) *Jan 2023 - May 2023*
Project: *Decentralized Multi-agent Heuristic Rollout*
- Contributed to a new Decentralized **Multi-agent Rollout** reinforcement learning algorithm to solve vehicle routing problem in unmapped environments
- Extended the algorithm for real world deployment with physical robot simulations (**Robotarium** testbed) and verified the cost improvement properties

Research Assistant under Prof. Jayant Gadge(MU) *Jan 2017 - May 2018*

Project: *Simulation of Autonomous Swarm Behaviors*

- Demonstrated a new prey-predator based co-evolution approach to develop nascent communication using Foot-bots in **ARGoS** simulator

Awards

Engineering Graduate Fellowship Ira A. Fulton Schools of Engineering (ASU) *2023 - 24*

Mentoring Experience

Matthew Groholski Barrett, The Honors College Thesis(ASU) *Aug 2023 - May 2024*

Completed Thesis. Evolving ant bridging behaviour for self-organizing particle systems

Raylene Faerber Biodesign Scholars Program (ASU) *Aug 2023 - Present*

Completed Project. Evolving flocking behaviour for self-organizing particle systems

Ongoing Project. Improving Evo-SOPS to evolve algorithms for multi-objective behaviors

Hillary Li Biodesign Scholars Program (ASU) *Aug 2024 - Present*

Ongoing Project. Improving Evo-SOPS to evolve algorithms for multi-objective behaviors

Ugenia Duan Biodesign Scholars Program (ASU) *Aug 2024 - Present*

Ongoing Project. Improving Evo-SOPS to evolve algorithms for multi-objective behaviors

Industry Experience

Senior Software Developer DreamSetGo, Mumbai, India *May 2020 - Jul 2022*

Achievements:

- Built a micro-services architecture based backend (**Node.js, MongoDB, ElasticSearch**) for company's travel web-application (**React, ReactNative**) with key features - payment processing, order management, coupons creation, invoice generation, data gathering pipeline
- Designed and setup the infrastructure on **AWS** with automated CI/CD capabilities

Fullstack Software Developer Games24x7, Mumbai, India *Jun 2018 - May 2020*

Achievements:

- Developed distributed, parallel micro-services architecture (**Node.js, Go, Django, MySQL, Redis, Web-sockets**) for multi-player online games including crucial features - real-time leaderboards, partial payments, tournament tickets which contributed over 53% of revenue and handled over 1 million concurrent players(peak)
- Achieved 15% - 20% overall performance improvement by initiating migration of web application from React 15 to React 16

Intern Kartographers, Mumbai, India *Jul 2017 - Apr 2018*

Helped secure project funding by successfully implementing the feature to live track hosts in maps with intra-zonal accuracy

Community Outreach

Psyche Programming Intern NASA Psyche Mission(ASU) *Aug 2022 - Dec 2022*

Assist undergraduate students to develop, host, debug and maintain capstone projects (web/mobile apps, AR/VR/WebXR apps, server-database services)

References

Prof. Joshua Daymude
Assistant Professor at School of Computing and Augmented Intelligence, Biodesign Center for Biocomputing, Security and Society at Arizona State University, **Email:** jdaymude@asu.edu

Prof. Paulo Shakarian
Associate Professor at School of Computing and Augmented Intelligence, Center for Cybersecurity and Trusted Foundations Affiliates at Arizona State University, **Email:** pshak02@asu.edu

Prof. Spring Berman
Associate Professor at School for Engineering of Matter, Transport and Energy, Global Security Initiative, Center for Human, Artificial Intelligence, and Robot Teaming at Arizona State University, **Email:** spring.berman@asu.edu