

# DEVENDRA R. PARKAR

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## PERSONAL INFORMATION

Devendra Rajendra Parkar  
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🔗 [devrz45](https://github.com/devrz45)

## RESEARCH INTERESTS

My broad research interest lies in understanding and building complex systems with distributed learning agents, especially, its implications in understanding human brain. My current research explores techniques from multi-agent optimization, stochastic processes and reinforcement learning to build and study multi-agent behaviors.

## EDUCATION

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

**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 On-line Rollout for Multivehicle Routing in Unmapped Environments*, International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2024) [Accepted], <https://doi.org/10.48550/arXiv.2305.15596>

Kaustuv Mukherji\*, **Devendra Parkar**\*, Lahari Pokala, Dyuman Aditya, Paulo Shakarian, Clark Dorman, *Scalable Semantic Non-Markovian Simulation Proxy for Reinforcement Learning*, International Conference on Semantic Computing (ICSC 2024) [Accepted], <https://doi.org/10.48550/arXiv.2310.06835> \*contributed equally

## ON-GOING WORK

**Devendra Parkar**, Joshua Daymude, Kirtus Leyba, *Evolving Collective Behaviors in Self-Organizing Particle Systems*, [Manuscript in preparation]

## 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 models to achieve collective behaviors of Aggregation, Separation and Object Coating using bio-inspired optimization algorithms - Genetic Algorithms, Particle Swarm Optimization
- Developed distributed, parallelized implementation of simulation pipeline using HPC-MPI framework

**Graduate Service Assistant** under Prof. Paulo Shakarian(ASU) May 2023 - Present  
Project: *IARPA HAYSTACK - Movement Generation (in collaboration with Leidos Inc.)*

- Researching constrained optimization of agent trajectory in knowledge infused graphs using heuristic based graph traversal algorithms

Project: *PyReason-Gym simulations for Symbolic Reinforcement Learning*

- Designed a new Deep-Q-Net algorithm to handle non-markovian time based dynamics
- Successfully demonstrated transfer of interpretable policies learnt in PyReason-Gym on PySC-II and AFSIM simulators

**Research Volunteer** under Prof. Andréa Richa(ASU), Prof. Dimitri Bertsekas(ASU/MIT) Jan 2023 - May 2023  
Project: *Decentralized Multi-agent Heuristic Rollout*

- Developed a new Decentralized Multi-agent Rollout algorithm to solve vehicle routing problem in unmapped environments
- Extended the algorithm for real world application with physical robot simulations (Robotarium testbed) and verified the cost improvement properties

	<b>Research Assistant</b> under Prof. Jayant Gadge(MU) Project: <i>Simulation of Autonomous Swarm Behaviors</i> <ul style="list-style-type: none"> <li>• Demonstrated a new prey-predator based co-evolution approach to develop nascent communication using Foot-bots in ARGoS simulator</li> </ul>	<i>Jan 2017 - May 2018</i>
AWARDS	<b>Engineering Graduate Fellowship</b> Ira A. Fulton Schools of Engineering (ASU)	<i>2023 - 24</i>
MENTORING EXPERIENCE	<b>Matthew Groholski</b> Barrett, The Honors College Thesis(ASU) On-going Thesis. Evolving bridging behaviour for self-organizing particle systems	<i>Aug 2023 - Present</i>
	<b>Raylene Faerber</b> Undergraduate Research(ASU) On-going Project. Evolving flocking behaviour for self-organizing particle systems	<i>Aug 2023 - Present</i>
INDUSTRY EXPERIENCE	<b>Senior Software Developer</b> DreamSetGo, Mumbai, India Achievements: <ul style="list-style-type: none"> <li>• Built the entire product backbone with key features - payment processing, order management, coupons creation, invoice generation, data gathering pipeline</li> <li>• Built the initial infrastructure on AWS with automated CI/CD capabilities</li> </ul>	<i>May 2020 - Jul 2022</i>
	<b>Fullstack Software Developer</b> Games24x7, Mumbai, India Achievements: <ul style="list-style-type: none"> <li>• Developed and deployed crucial features - leaderboards, partial payments, tournament tickets which generate over 53% of revenue and handle over 1 million concurrent users(peak)</li> <li>• Achieved 15% - 20% overall performance improvement by initiating migration of web application from React 15 to React 16</li> </ul>	<i>Jun 2018 - May 2020</i>
	<b>Intern</b> Kartographers, Mumbai, India Helped secure project funding by successfully implementing the feature to live track hosts in maps with intra-zonal accuracy	<i>Jul 2017 - Apr 2018</i>
COMMUNITY OUTREACH	<b>Psyche Programing Intern</b> NASA Psyche Mission(ASU) Assist undergraduate students to develop, host, debug and maintain capstone projects (web/mobile apps, AR/VR/WebXR apps, server-database services)	<i>Aug 2022 - Dec 2022</i>
REFERENCES	<p><b>Prof. Joshua Daymude</b> Assistant Professor at School of Computing and Augmented Intelligence, Biodesign Center for Biocomputing, Security and Society at Arizona State University, <b>Email:</b> jdaymude@asu.edu</p> <p><b>Prof. Paulo Shakarian</b> Associate Professor at School of Computing and Augmented Intelligence, Center for Cybersecurity and Trusted Foundations Affiliates at Arizona State University, <b>Email:</b> pshak02@asu.edu</p> <p><b>Prof. Spring Berman</b> 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, <b>Email:</b> spring.berman@asu.edu</p>	