

# DEVENDRA R. PARKAR

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## PERSONAL INFORMATION

Devendra Rajendra Parkar  
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## RESEARCH INTERESTS

My broad research interest lies in understanding and building complex systems with distributed agents. 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

## SUBMISSIONS

Jamison Weber, Dhanush Giriyan, **Devendra Parkar**, Andréa Richa, Dimitri Bertsekas, *Distributed On-line Rollout for Multivehicle Routing in Unmapped Environments*, <https://doi.org/10.48550/arXiv.2305.15596> [Submitted and under review]

Kaustuv Mukherji\*, **Devendra Parkar**\*, Lahari Pokala, Dyuman Aditya, Clark Dorman, Paulo Shakarian, *Scalable Semantic Non-Markovian Simulation Proxy for Reinforcement Learning with Temporal Logic Programming*, [Submitted and under review] \*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 behaviours 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*

- 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) 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

**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	<b>Graduate Engineering Fellowship</b> Ira A. Fulton Schools of Engineering (ASU)	2023 - 24
MENTORING EXPERIENCE	<b>Matthew Groholski</b> Barrett, The Honors College Thesis(ASU) On-going Thesis. Evolving bridging behaviour for self-organizing particle systems	Aug 2023 - Present
	<b>Raylene Faerber</b> Undergraduate Research(ASU)	Aug 2023 - Present
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>	May 2020 - Jul 2022
	<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>	Jun 2018 - May 2020
	<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	Jul 2017 - Apr 2018
COMMUNITY OUTREACH	<b>Psyche Programming 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)	Aug 2022 - Dec 2022
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>	