

# Carlos Martin

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EDUCATION	<b>Carnegie Mellon University</b> , PhD in computer science (artificial intelligence) 2019-08 / present <b>Carnegie Mellon University</b> , MS in computer science 2019-08 / 2021-05 <b>Columbia University</b> , BS in computer science, minor in applied math 2014-09 / 2019-05 <i>Magna cum laude</i> . GPA 3.93 (Dean's List all semesters). Specialization in intelligent systems. Courses: machine learning, artificial intelligence, natural language processing, computer vision, Bayesian statistics, graphical models, numerical methods, optimization, PDEs, graph theory
PUBLICATIONS	<b>Predicting the large-scale evolution of tag systems</b> . <i>Complex Systems</i> , 25(2). 2016-05 <b>Bayesian multiagent inverse reinforcement learning for policy recommendation</b> . AAAI RLG. 2021 <b>Efficient exploration of zero-sum stochastic games</b> . AAAI RLG. 2021 <b>Finding mixed-strategy equilibria of continuous-action games without gradients using randomized policy networks</b> . IJCAI. 2023 <b>Model-free preference elicitation</b> . IJCAI. 2024 <b>ApproxED: Approximate exploitability descent via learned best responses</b> . AAMAS. 2025 <b>AlphaZeroES: Direct score maximization outperforms planning loss minimization</b> . AAMAS EA. 2025 <b>Joint-perturbation simultaneous pseudo-gradient</b> . IJCAI. 2025 <b>Incremental multiple oracle</b> . AAMAS EA. 2026
PREPRINTS	<b>Differentiable cellular automata</b> . arXiv:1708.09546. 2017 <b>Generation and analysis of lamplighter programs</b> . arXiv:1707.02652. 2017 <b>Simultaneous incremental support adjustment and metagame solving: An equilibrium-finding framework for continuous-action games</b> . arXiv:2406.08683. 2024 <b>AlphaZeroES: Direct score maximization outperforms planning loss minimization</b> . arXiv:2406.08687. 2024 <b>Joint-perturbation simultaneous pseudo-gradient</b> . arXiv:2408.09306. 2024 <b>Solving infinite-player games with player-to-strategy networks</b> . arXiv:2501.09330. 2024
EXPERIENCE	<b>Google</b> , student researcher 2023-06 / 2023-09 Researched model-free preference elicitation algorithms for recommender systems <b>Columbia Computer Vision Lab</b> , researcher 2018-09 / 2019-05 Researched one-shot image recognition through spatiochromatic deformations <b>Columbia Center for Theoretical Neuroscience</b> , researcher 2018-09 / 2019-05 Researched mean-field variational Bayesian inference with adaptive priors <b>Columbia Robotics Lab</b> , researcher 2018-05 / 2018-08 Developed reinforcement learning algorithms for robots that use EEG signals <b>Goldman Sachs</b> , summer analyst 2016-06 / 2016-08 Created automated information retrieval and information extraction system <b>Wolfram Research</b> , research intern 2016-01 / 2016-05 Created step-by-step educational problem-solving software for Mathematica <b>Columbia Lightwave Research Lab</b> , researcher 2015-06 / 2015-08 Researched parallel computing architectures and algorithms for photonic networks <b>Wolfram Research</b> , researcher 2015-06 / 2015-07 Researched large-scale dynamics of cellular automata and tag systems <b>TRIUMF National Lab for Particle and Nuclear Physics</b> , researcher 2014-06 / 2014-08 Researched laser ion sources and resonance ionization spectroscopy
VOLUNTEERING	<b>Wolfram Research</b> , student ambassador 2015-12 / 2018-05 Organized workshops and seminars on Mathematica and Wolfram Research <b>Columbia Data Science Society</b> , board member 2015-10 / 2017-05 Organized data science and machine learning workshops and hackathons <b>ADI Labs</b> , software developer 2015-09 / 2015-12 Created Bayesian online changepoint detection system for stream processor <b>Columbia Organization of Rising Entrepreneurs</b> , software developer 2015-09 / 2015-12 Developed website using Python Flask, Bootstrap, Sass, Material Design
HONORS	<b>Fluor Foundation Scholarship</b> 2016-05 / 2018-05 Awarded for academic excellence to students enrolled in engineering programs <b>Egleston Scholarship</b> , enhanced advising and financial support for research 2014-09 Awarded to top 1% of engineers for extraordinary achievement as researchers and leaders <b>TRIUMF Fellowship</b> 2014-05 Awarded to 3 students with passionate interest and demonstrated excellence in physics
SKILLS	<b>Programming languages</b> : Python (incl. PyTorch, JAX), Java, C++, JavaScript, Haskell, Matlab, Mathematica <b>Computational physics</b> : electromagnetics, fluid dynamics, rigid body dynamics, Monte Carlo methods <b>Language proficiency</b> : English and Spanish (bilingual), Mandarin Chinese (elementary) <b>Debate and public speaking</b> : Model United Nations (2011–2014), National Debate Seminar (2012), Senior National Debate Championships (2013), Oxford Cup Debate Tournament (2013)