Carlos Martin

cgmartin@cs.cmu.edu • carlosgmartin.com • github.com/carlosgmartin • linkedin.com/in/carlosgmartin

EDUCATION

Carnegie Mellon University, PhD in computer science (artificial intelligence) — ongoing
Carnegie Mellon University, MS in computer science — 2021/05
Columbia University, BS in computer science, minor in applied math — 2019/05
Magna cum laude. 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

Predicting the large-scale evolution of tag systems. *Complex Systems*, 25(2), 2016/05.
Bayesian multiagent inverse reinforcement learning for policy recommendation. AAAI-21 RLG.
Efficient exploration of zero-sum stochastic games. AAAI-21 RLG.
Finding mixed-strategy equilibria of continuous-action games without gradients using randomized policy networks. IJCAI-23.
Model-free preference elicitation. IJCAI-24.
ApproxED: Approximate exploitability descent via learned best responses. AAMAS-25.
AlphaZeroES: Direct score maximization outperforms planning loss minimization. AAMAS-25 extended abstract.
Joint-perturbation simultaneous pseudo-gradient. IJCAI-25. To appear.

PREPRINTS

Differentiable cellular automata. arXiv:1708.09546. 2017.
Generation and analysis of lamplighter programs. arXiv:1707.02652. 2017.
Simultaneous incremental support adjustment and metagame solving: An equilibrium-finding framework for continuous-action games. arXiv:2406.08683. 2024.
AlphaZeroES: Direct score maximization outperforms planning loss minimization. arXiv:2406.08687. 2024.
Joint-perturbation simultaneous pseudo-gradient. arXiv:2408.09306. 2024.
Solving infinite-player games with player-to-strategy networks. arXiv:2501.09330. 2024.

EXPERIENCE

Google, Student Researcher — 2023/06 – 2023/09
Researched model-free preference elicitation algorithms for recommender systems
Columbia Computer Vision Lab, researcher — 2018/09 – 2019/05
Researched one-shot image recognition through spatiochromatic deformations
Columbia Center for Theoretical Neuroscience, researcher — 2018/09 – 2019/05
Researched mean-field variational Bayesian inference with adaptive priors
Columbia Robotics Lab, researcher — 2018/05 – 2018/08
Developed reinforcement learning algorithms for robots that use EEG signals
Goldman Sachs, summer analyst — 2016/06 – 2016/08
Created automated information retrieval and information extraction system
Wolfram Research, research intern — 2016/01 – 2016/05
Created step-by-step educational problem-solving software for Mathematica
Columbia Lightwave Research Lab, researcher — 2015/06 – 2015/08
Researched parallel computing architectures and algorithms for photonic networks
Wolfram Research, researcher — 2015/06 – 2015/07
Researched large-scale dynamics of cellular automata and tag systems
TRIUMF National Lab for Particle and Nuclear Physics, researcher — 2014/06 – 2014/08
Researched laser ion sources and resonance ionization spectroscopy

VOLUNTEERING

Wolfram Research, student ambassador — 2015/12 – 2018/05
Organized workshops and seminars on Mathematica and Wolfram Research
Columbia Data Science Society, board member — 2015/10 – 2017/05
Organized data science and machine learning workshops and hackathons
ADI Labs, software developer — 2015/09 – 2015/12
Created Bayesian online changepoint detection system for stream processor
Columbia Organization of Rising Entrepreneurs, software developer — 2015/09 – 2015/12
Developed website using Python Flask, Bootstrap, Sass, Material Design

HONORS

Fluor Foundation Scholarship — 2016/05 – 2018/05
Awarded for academic excellence to students enrolled in engineering programs
Egleston Scholarship, enhanced advising and financial support for research — 2014/09
Awarded to top 1% of engineers for extraordinary achievement as researchers and leaders
TRIUMF Fellowship — 2014/05
Awarded to 3 students with passionate interest and demonstrated excellence in physics

SKILLS

Programming languages: Python (incl. PyTorch, JAX), Java, C++, JavaScript, Haskell, Matlab, Mathematica
Computational physics: electromagnetics, fluid dynamics, rigid body dynamics, Monte Carlo methods
Language proficiency: English and Spanish (bilingual), Mandarin Chinese (elementary)
Debate and public speaking: Model United Nations (2011–2014), National Debate Seminar (2012), Senior National Debate Championships (2013), Oxford Cup Debate Tournament (2013)