Juan Agustin Duque

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Education

Mila Québec AI Institute — Montréal, Québec
Ph.D. in Computer Science, GPA: 4.3/4.3 — August 2022 - Present
Advised by Aaron Courville

Princeton University — Princeton, New Jersey
M.S.E. in Computer Science, GPA: 3.9/4.0 — September 2020 - May 2022
Advised by Karthik Narasimhan

Georgia Institute of Technology — Atlanta, Georgia
B.S. in Computer Science, GPA: 4.0/4.0 — August 2014 - December 2018
Advised by Charles Isbell and Michael Loss

Research Interests

Deep Reinforcement Learning, Multi-agent Reinforcement Learning, Game Theory.

Publications

Quentin Bertrand, **Juan Agustin Duque**, Emilio Calvano, Gauthier Gidel. "Q-learners Can Provably Collude in the Iterated Prisoner's Dilemma", (**ICML 2025**). **Link**.

Juan Agustin Duque*, Milad Aghajohari*, Tim Cooijmans, Razvan Ciuca, Tianyu Zhang, Gauthier Gidel, Aaron Courville. "Advantage Alignment Algorithms", (**ICLR 2025 Oral**). **Link**.

Milad Aghajohari*, **Juan Agustin Duque***, Tim Cooijmans, Aaron Courville. "LOQA: Learning with Opponent Q-Learning Awareness", 2023. (**ICLR 2024**). **Link**.

Milad Aghajohari, Tim Cooijmans, **Juan Agustin Duque**, Shunichi Akatsuka, Aaron Courville. "Best Response Shaping", (**RLC 2024**). **Link**.

Honors and Awards

St-Pierre-Larochelle Scholarship *Université de Montréal*	2024
International Scholarship *Université de Montréal*	2022
Cornell, Maryland, Max Planck Pre-Doctoral Research School *CMMRS*	2021
Graduate Studentship *Princeton University*	2020
Colfuturo Scholarship *Colfuturo*	2020
Highest Honors, Rank 1/6321 *Georgia Institute of Technology*	2018
Rank 11/600 000 in Colombia's national high school exit examination *ICFES*	2013

Research Experience

Mila Quebec AI Institute, Université de Montréal — Montreal, QC
Advisor: Aaron Courville. — September 2022 - Present

Designing multi-agent reinforcement learning algorithms that allow agents to develop cooperative and non-exploitable behavior general sum games.

Princeton NLP Group, Princeton University — Princeton, NJ
Advisors: Karthik Narasimhan, Elad Hazan — August 2020 - Present

Pre-trained Transformers using self-supervised learning to generate representations for fast fine-tuning in Atari games. Developed exploration strategies in Reinforcement Learning that leverage simple heuristics (e.g. depth) to converge faster to more optimal solutions.

Institute for Robotics and Intelligent Machines, Georgia Tech — Atlanta, GA
Advisors: Charles Isbell, Michael Loss — August 2017 - December 2018

Designed and implemented hierarchical RL algorithms using spectral graph partitioning to select goals programmatically.

Industry Experience

Machine Learning Engineering Intern, LinkedIn — Sunnyvale, CA
AI foundations, Mentors: Zhoutong Fu, Michaeel Kazi — May 2021 - August 2021

Pre-trained a multi-task BERT model with LinkedIn data used as an encoder for downstream NLP applications. Contributed to the data collection pipeline for large language models.

Software Engineer, Microsoft — Redmond, WA
msn.com, Mentor: Rong Fang — April 2019 - July 2020

Created a machine learning title generation service of Microsoft News for articles, slide shows, and videos. Developed cloud micro-services to process, enhance, and ingest news documents.

Data Science Intern, Microsoft — Redmond, WA
msn.com, Mentor: Ying Qiao — May 2018 - July 2018

Designed a recommendation system for news articles based on users' reading history, using neural networks in Pytorch. Built a Rest API and a client to deploy a live traffic experiment on msn.com.

Software Engineering Intern, Google — San Francisco, CA
Google Cloud, Mentor: Ali Ayyash — May 2017 - August 2017

Designed, implemented, and tested an API that improves the latency of moving projects and folders concurrently within Google's cloud resource hierarchy.

Teaching Experience

Graduate Student Preceptor, Princeton University — Fall 2020 - Spring 2022
Itroduction to Machine Learning, Introduction to Programming Systems — Princeton, NJ

Led biweekly lectures of 10 students about introductory Machine Learning, Computer Science and Systems Design. Held office hours, graded assignments and designed exam questions.

Service

Reviewer for ICLR, TMLR

Skills

Assembly, C, C++, C#, Java, Wolfram, Python, NumPy, PyTorch, JAX, Git, LaTeX

Citizenships

Colombia, Belgium

Languages

Spanish (Native), English (Native), German (Proficient)