Alejandro Escontrela

mail@escontrela.me | escontrela.me

Ph.D. Artificial Intelligence and Robotics, University of California, Berkeley

Education

University of California, Berkeley — July 2021 - Present
Ph.D. in Artificial Intelligence and Robotics — Berkeley
Advised by **Pieter Abbeel**

Georgia Institute of Technology — January 2018 - May 2021
B.S. in Aerospace Engineering — Atlanta
Major GPA: 4.0/4.0
Minor in Computer Science (Minor GPA: 4.0/4.0)
Advised by **Frank Dellaert**

University of Central Florida — August 2016 - December 2017
B.S. in Aerospace Engineering (GPA 3.93/4.0) — Orlando

Research Experience

Student Researcher: Google DeepMind — July 2021 - Present
Advisor: Thomas Kipf — San Francisco

Working on controllability of generative models to provide users with more ways to interact with generative models than just text. Current focus is on image generation models.

Ph.D. Student: UC Berkeley BAIR — August 2021 - Present
Advisors: Pieter Abbeel — Berkeley

Performing research on reinforcement learning, generative modeling, world models, and their applications to robotics.

Student Researcher: Google Brain — August 2020 - February 2023
Advisor: Atil Iscen — New York City

Part-time researcher at Google Brain. Collaborating with the Google Brain Robotics team to push the boundaries of robot learning.

Research/Software Engineering Intern: Google Brain — May 2020 - August 2020
Advisor: Atil Iscen — New York City

Worked with the Google Brain Robotics team to develop locomotion policies that allow legged robots to operate in unstructured, rugged terrains. This work has resulted in several publications listed below.

Undergraduate Researcher: Borglab @ Georgia Tech — August 2019 - August 2021
Advisor: Frank Dellaert — Atlanta

Conducted research on the optimal control of legged robots via graphical probabilistic models, such as Factor Graphs. My research aimed to bring forth controls algorithms capable of

navigating legged robots through complex, partially observable environments. Some of this work has culminated in publications listed below.

Consulting

AI Consultant: Phaidra March 2024 - July 2024
Team: Research Remote
Worked with team to apply advanced RL techniques to datacenter cooling models.

Industry Experience

Software Engineering Intern: Google May 2019 - August 2019
Team: Cloud (Colossus) New York City
Worked with David Cohen at Google Cloud to develop DapperMC, a probabilistic programming library tailored to modeling Remote Procedure Calls (RPC). Google engineers now use DapperMC to obtain a statistical understanding of datacenter performance, detect anomalous machines, and benchmark the effects of software updates on RPC latency.

Software Engineering Intern: Northrop Grumman May 2018 - August 2018
Team: Mission Systems Orlando
Work performed under a security clearance. Worked on a network that provides joint forces with a capability to report, analyze, and disseminate warning information to accelerate the serviceperson's response to Chemical, Biological, Radiological and Nuclear (CBRN) attack. Reduced the time from incident observation to warning to less than two minutes.

Other Experience

Software Team Lead: Georgia Tech RoboJackets September 2018 - June 2019
Team: Intelligent Ground Vehicle Competition Atlanta
Worked alongside mechanical and electrical team leads to coordinate the development of autonomous outdoor navigation software for the Intelligent Ground Vehicle Competition. Coordinated a team of eight software engineering students to implement various state-of-the-art robotics algorithms, including Factor Graph SLAM, Field D*, the Elastic Bands path planning algorithm, etc. *My team won 1st place in the design competition, and 3rd place overall out of over 30 international teams competing in the event, thereby making school history.* GitHub: `https://bit.ly/3iTEHMV`.
Autonomous Navigation Stack Demo: `https://bit.ly/34JVmii`.

Publications and Manuscripts

- **"Learning Robotic Locomotion Affordances and Photorealistic Simulators from Human-Captured Data"**
  Alejandro Escontrela, Justin Kerr, Kyle Stachowicz, Pieter Abbeel.
  In submission, CoRL 2024 | Code/paper/website available soon
- **"Video Prediction Models as Rewards for Reinforcement Learning"**
  Alejandro Escontrela, Ademi Adeniji, Wilson Yan, Ajay Jain, Xue Bin Peng, Ken Goldberg, Youngwoon Lee, Danijar Hafner, Pieter Abbeel.

NeurIPS 2023 escontrela.me/viper

- **"Learning a Diffusion Model Policy from Rewards via Q-Score Matching"**
  Michael Psenka*, **Alejandro Escontrela***, Pieter Abbeel, Yi Ma.
  ICML 2024 escontrela.me/qsm
- **"Barkour: Benchmarking animal-level agility with quadruped robots"**
  Ken Caluwaerts, Atil Iscen, J. Chase Kew, Wenhao Yu, Tingnan Zhang, Daniel Freeman, Kuang-Huei Lee, Lisa Lee, Stefano Saliceti, Vincent Zhuang, Nathan Batchelor, Steven Bohez, Federico Casarini, Jose Enrique Chen, Omar Cortes, Erwin Coumans, Adil Dostmohamed, Gabriel Dulac-Arnold, **Alejandro Escontrela**, Erik Frey, Roland Hafner, Deepali Jain, Bauyrjan Jyenis, Yuheng Kuang, Edward Lee, Linda Luu, Ofir Nachum, Ken Oslund, Jason Powell, Diego Reyes, Francesco Romano, Feresteh Sadeghi, Ron Sloat, Baruch Tabanpour, Daniel Zheng, Michael Neunert, Raia Hadsell, Nicolas Heess, Francesco Nori, Jeff Seto, Carolina Parada, Vikas Sindhwani, Vincent Vanhoucke, Jie Tan.
  IEEE Intelligent Robots and Systems 2024 (IROS) https://bit.ly/3Smxquc
- **"Visual-locomotion: Learning to walk on complex terrains with vision"**
  Wenhao Yu, Deepali Jain, **Alejandro Escontrela**, Atil Iscen, Peng Xu, Erwin Coumans, Sehoon Ha, Jie Tan, Tingnan Zhang.
  Conference on Robot Learning 2022 (CoRL) http://bit.ly/3HvJvrW
- **"Adversarial Motion Priors Make Good Substitutes for Complex Reward Functions"**
  Alejandro Escontrela, Xue Bin Peng, Wenhao Yu, Tingnan Zhang, Atil Iscen, Ken Goldberg, Pieter Abbeel.
  IEEE Intelligent Robots and Systems 2022 (IROS) escontrela.me/amp_in_real
  Best Paper Award Nomination (11 nominations of >1700 papers)
- **"DayDreamer: World Models for Physical Robot Learning"**
  Philipp Wu*, **Alejandro Escontrela***, Danijar Hafner*, Ken Goldberg, Pieter Abbeel. (*=equal authors)
  Conference on Robot Learning 2022 (CoRL) escontrela.me/daydreamer/
- **"Autonomously Untangling Long Cables"**
  Vainavi Viswanath, Kaushik Shivakumar, Justin Kerr, Brijen Thananjeyan, Ellen Novoseller, Jeffrey Ichnowski, **Alejandro Escontrela**, Michael Laskey, Joseph E Gonzalez, Ken Goldberg.
  Robots, Science, and Systems 2022 (RSS) escontrela.me/autonomous_untangling
  Best Systems Paper Award
- **"Learning Visual-Locomotion Policies that Generalize to Diverse Environments"**
  Alejandro Escontrela, George Yu, Peng Xu, Atil Iscen, Jie Tan.
  NeurIPS 3rd Robot Learning Workshop, 2020. https://bit.ly/3kvdzEO
- **"Zero-Shot Terrain Generalization for Visual Locomotion Policies"**
  Alejandro Escontrela, George Yu, Peng Xu, Atil Iscen, Jie Tan.
  arXiv https://arxiv.org/abs/2011.05513
- **"A Factor-Graph Approach for Optimization Problems with Dynamics Constraints"**
  Mandy Xie, **Alejandro Escontrela**, Frank Dellaert.
  arXiv https://arxiv.org/abs/2011.06194

- **"Learning Agile Locomotion Skills with a Mentor"**
  Atil Iscen, George Yu, **Alejandro Escontrela**, Jie Tan.
  ICRA 2021. `https://arxiv.org/abs/2011.05541`
- **"Convolutional Neural Networks from the Ground Up"**
  Alejandro Escontrela.
  Medium Technical post. ***https://bit.ly/3jTunWC***
  Over 100,000 reads

Service

- **"1st Learning for Agile Robotics Workship @ CoRL 2022**
  Auckland, New Zealand. `https://www.agilerobotscorl2022.com/`
- **U.C. Berkeley Ph.D. Admissions Reviewer 2022**

Notable Awards and Honors

- Best Paper Award Finalist (11 nominations from >1700 papers) — IROS 2022
- Best Systems Paper Award — RSS 2022
- National Science Foundation GRF — 2021
- MIT Presidential Fellowship — 2021
- UC Berkeley Chancellor's Fellowship — 2021
- Stanford School of Engineering Fellowship — 2021
- Lemelson MIT Student Prize Competition Competition Finalists — 2020
- Hispanic Scholarship Fund Award — 2018, 2019, 2020
- Faculty Honors, Georgia Tech — 2018, 2019, 2020
- Google Accessibility Hackathon NYC: 1st Place — 2019
- Walt Disney World Design and Engineering Award — 2017
- Pegasus Scholarship — 2017

Media Coverage

- Google AI Blog — 2023
- Popular Science — 2023
- Daily Mail — 2022
- MIT Technology Review — 2022
- TechCrunch (video) — 2022
- Berkeley Engineering — 2022
- India Times — 2022
- New Scientist — 2022
- Synced — 2022
- Singularity Hub — 2022
- ZME Science — 2022
- Technology Org — 2022
- Analytics India Magazine (AIM) — 2022
- MarkTechPost — 2022
- News7g — 2022
- ActuIA — 2022
- I Programmer — 2022