Alejandro Escontrela

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

Education

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

Georgia Institute of Technology — January 2018 - May 2021
B.S. in Aerospace Engineering — Atlanta
Major GPA: 4.00/4.0 (3.96 Cumulative)
Minor in Computer Science

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

Research Experience

Ph.D. Candidate: UC Berkeley BAIR — August 2021 - Present
Advisors: Pieter Abbeel, Ken Goldberg — Berkeley
Performing research on reinforcement learning, generative modeling, world models, and their applications to robotics.

Student Researcher: Google Brain — August 2020 - Present
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
Conducting research on the optimal control of legged robots via graphical probabilistic models, such as Factor Graphs. My research aims 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.

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

- **"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 2021 (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) ***http://bit.ly/3Pp5Jh3***
  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) `http://bit.ly/3BB0tl0`
- **"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) ***https://arxiv.org/abs/2207.07813***
  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.
In submission. ICRA 2022. https://arxiv.org/abs/2011.05513
- **"A Factor-Graph Approach for Optimization Problems with Dynamics Constraints"**
Mandy Xie, Alejandro Escontrela, Frank Dellaert.
In submission. ICRA 2022. 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.
Technical post. Medium 2018 (over 100,000 reads) | https://bit.ly/3jTunWC

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

- 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