Hi,

I'm excited to work at the frontier of AI. In 2023, after graduating with my SB + MEng from MIT, that goal was best fulfilled by joining Boston Dynamics AI Institute in a research engineer role, where I got to lead research projects in my area of robotics (task and motion planning) and also do software engineering supporting and integrating various research projects across our team into a cohesive robotic system, such as writing software to train diffusion models for robot skill learning. Task and motion planning is an area of robotics that usually involves neuro-symbolic learning -- AI that integrates neural networks and symbolic reasoning in a modular fashion, different from training one large end-to-end differentiable model. With all the advancements happening the past year, I now think large, end-to-end models are the most interesting, impactful frontier of AI to work on.

A bit more about my background:

I spent the first few years after my undergraduate college experience exploring a wide variety of interests with both breadth and depth, with a greater balance of exploration-exploitation than what I think is the average. In addition to my experience doing AI research for several years, the depth at which I've explored other disciplines has endowed me with a unique ability to think, ideate, and reason sharply and creatively. This interdisciplinary foundation not only highlights my capacity to quickly grasp technically complex concepts but also enriches my perspective as an ML researcher: I have a greater understanding of the world and I have different ways of thinking about problems beyond the typical ML researcher's viewpoint.

Here as some aspects of my resume that I'll highlight:

- **Robotics and AI**. After undergrad, I did a masters in robotics at MIT under professors Leslie Kaelbling and Tomás Lozano-Pérez, researching robot skill learning in a task and motion planning (TAMP) framework via imitation learning and RL. I also spent some time on cognitive science research in Prof. Josh Tenenbaum's lab. This work naturally led to my job this past year at Boston Dynamics AI Institute (BDAI), where I continued my research agenda in TAMP. I have one publication [arXiv, Google Scholar] at CoRL 2022 from my masters work, and two first-author works coming out soon from my time at BDAI. One of these works uses video-language models for proposing predicates (concepts that abstract the low-level state of the world) and labeling predicate truth values in a robot's environment, towards predicate invention and learning state and action abstractions. An early-stage workshop version (accepted to Planning in the Era of LLMs workshop @ AAAI 2025) of this paper is available to read here. I can now read papers in robotics and cognitive science and understand what's going on and do good research in these areas.
- **Teaching**. I really care about understanding things deeply. That's one of the reasons I love teaching. I've TAed many semesters of undergraduate machine learning and undergraduate probability at MIT. I've also TAed "6.437: Inference and Information", one of the hardest grad classes at MIT in computer science / math. I've also mentored lecture scribing for many courses (e.g. 18.700, 18.701, 18.702 -- my involvement noted at the start of chapter 1 in each).
- **Economics**. After undergrad and before my M.Eng., I deep-dived into my interests in economics for one year by completing MIT's rigorous first-year PhD economics class sequence and contributing to empirical economics research at MIT as a research assistant, earning a second major in economics. I did this to obtain a strong background in economics and learn the

tools to answer policy questions rigorously.. I can now read theoretical and empirical economics research papers and understand what's going on and do good research in this area.

- **Education**. Before attending MIT, I had taken classes on MIT OpenCourseWare (OCW). While at MIT, I worked part-time at OCW to improve it. After realizing I could be more effective in my own organization, I raised money and founded my own group (SOUL / soul.mit.edu) to work on open-sourcing college curricula. In particular, we build AI tools to massively speed up the pipeline to collect and process learning materials for online publication. We're on track before 2026 to make the entirety of the MIT economics undergraduate curriculum's learning materials available online for free in a realistically learnable format. As part of my efforts to deeply understand the inner-workings of higher education, I also taught a seminar class at MIT called "hacking higher ed" and participated in the AI-education reading group at MIT. I can now read papers in education and understand what's going on and come up with good research projects in this area.

I'm someone who has deeply explored a few different areas. I bring a unique perspective and ability to think creatively that draws on insights from multiple disciplines. I care about understanding how things work at a fundamental level and using that knowledge to innovate new solutions to hard, unsolved problems. I thrive when I'm working on hard problems with amazing collaborators. I've had great opportunities to work on robotics, machine learning, and AI on great teams (Raytheon BBN, NASA JPL, GM Cruise, Microsoft Research, Waymo, MIT laboratories, Boston Dynamics AI Institute). I want to work hard on research at the frontier of AI and help make a big impact on the world.

References (phone numbers available upon request)**:**

- Prof. Leslie Kaelbling (MIT): lpk@mit.edu
- Prof. Tomás Lozano-Pérez (MIT): tlp@mit.edu
- Prof. Tom Silver (Princeton): tsilver@princeton.edu
- Nishanth Kumar (MIT): njk@mit.edu
- Gustavo Goretkin (Boston Dynamics AI Institute): ggoretkin@theaiinstitute.com
- Jiuguang Wang (Boston Dynamics AI Institute): jw@theaiinstitute.com

Best,
Ashay Athalye