

Dr. Rosenfeld,

For the last 10 years, I have been working in the private industry, applying AI to grid-scale energy storage. Helping to move the needle on global climate change was rewarding, but a dark cloud loomed over everything my team accomplished: The potential for AI-enabled market manipulation, which could harm both consumers and the environment.

Clearly, these tools are too powerful to leave entirely in the hands of private industry, and that's why I'd like to join your lab as a Junior Research Scientist. While I already have extensive experience applying machine learning to practical problems, what I don't have is an academic research portfolio. By contributing to your lab's work understanding the future applications of computing, I hope to make myself an attractive candidate for PhD programs.

From scrappy start-ups to the U.S. military, I have succeeded in many work environments, but I believe that the self-directed, curiosity driven academic world is where I will really thrive.

From 2019-2022, I led a diverse, five-person team (including one woman with a PhD in engineering and public policy). Together, we researched and developed several prototypes, including:

- Operational cost modeling that integrated predicted system demands to better design and price product offerings,
- Modeling battery degradation to predict and optimize maintenance,
- System modeling and a temperature visualization for early detection of system problems.

I also work well on my own. Before assembling this team, I developed test automation tools for a first-of-its-kind modular energy storage system and collaborated with a colleague to create a machine learning controlled cooling system. When I was in the Navy, I independently researched control system cybersecurity topics to implement a coordinated response to StuxNet for nuclear ships, and then led the resultant cybersecurity program.

While I have been out of academia for two decades, I was such a star student, my RPI professors still remember me. Due to my quick grasp of first principles in epistemology, Dr. Jim Fahey recruited me to be a teacher's assistant for a multidisciplinary "minds and machines" introductory course. I also TA'd for Dr. Sybil Schupp's theory of programming languages course. In the summer, I worked in the lab of Dr. Wes Huang, writing motion planning code for drone vehicles, as part of a research project on optimal coverage algorithms.

While I have a lot of experience, what I really bring to the table is a rare combination of persistence and a "beginner mind." I never assume I know everything, and I absolutely love exploring new concepts and ideas—particularly when these ideas will shape our future.

I am particularly excited to discover how the fundamentals of AI research can be used in the service of societal good. From direct questions like finding which tasks AI is best suited for, or where to place AI within our economy—to more abstract questions like how it can enhance human cognition, or how it can expand the frontiers of science and art.

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