

Applied Energy Division:

Postdoctoral position focused on large-scale data analysis, mathematical optimization, and distributed computing applied to large data sets in the solar PV industry

The Applied Energy Division is dedicated to research and development that contributes to science, sustainability, SLAC's impact and relevance, the U.S. energy situation, and national competitiveness. SLAC's translational research program in sustainability and applied energy technologies includes a strategic focus on solar energy, batteries/energy storage, the power grid, water desalination, and advanced manufacturing technologies.

The Grid Integration, Systems and Mobility (GISMo) team, part of the Applied Energy Division, is a multidisciplinary research group exploring cross-cutting areas in power grid, building and ambient intelligence, and human mobility. In our research, we aim to increase the efficiency and reliability of the power grid with high penetration of distributed energy resources, improve our daily interactions with our environments, and answer key challenges in the electrification of transportation. Our research is motivated by the drive to integrate clean energy technology to enable 100% clean energy for all.

In collaboration with Professor Stephen Boyd from the Department of Electrical Engineering at Stanford University, we are seeking postdoctoral researchers who have a strong background in mathematical optimization and care deeply about contributing to impactful applied research to develop solutions for the urgent challenges of energy system decarbonization. Postdoctoral researchers will lead the development and implementation of high-impact tools and techniques using advanced analytical and machine learning tools.

This is a two-year appointment, with a possible extension to a third year, available to begin immediately under the PVInsight project. This project is funded by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) through the Solar Energy Technologies Office and is focused on developing new analytical approaches to performing digital operations and maintenance on large fleets of heterogeneous photovoltaic (PV) power generation systems. The candidate will focus primarily on developing and implementing algorithms for solving mathematical optimization problems in distributed, cloud-computing environments, and they will work closely with Prof. Boyd and the PVInsight project team, which includes members of the GISMo team as well as researchers at other national laboratories and from industry.

Specific responsibilities (include but are not limited to):

- Independently research, conceptualize, and document scientific work in distributed mathematical optimization with a focus on applications pertaining to signal processing and time-series analysis.
- Document methodologies, solutions and implementation; maintain and update software and documentation as needed.
- Serve as a technical resource for scientists, engineers, and other post-doctoral researchers.
- Verify, validate, compare, evaluate, and present results of work products.
- Supervise undergraduate intern and graduate students.

Minimum Qualifications:

- PhD in mathematical optimization, signal processing, statistics, or a related field.
- Demonstrated proficiency in Python, GitHub, Cloud platforms, and data processing.
- Experience writing academic and research papers.
- Flexibility and interest to work independently in a dynamic, high-productivity research environment.

Preferred Qualifications:

- Familiarity with convex optimization
- Experience with numerical linear algebra methods, especially scaling to very large problem sizes
- Experience with high-performance and cluster computing
- Experience with the SciPy scientific computing software ecosystem
- Exceptional technical writing skills.
- Strong communication skills with both technical and non-technical groups.
- Strong organizational skills.
- Demonstrated interest in renewable energy and distributed energy resources.
- Big picture understanding of problems in the renewable energy space.
- Ability to lead activities on structured team development projects.

What we offer you:

- A constant stream of new things to learn. We're always expanding into new areas, bringing in new projects and developing new technologies in the Applied Energy field.
- Advisorship from Prof. Stephen Boyd.
- Growth and mentorship from exceptionally talented engineers and scientists from SLAC and Stanford University, plus an opportunity for you to mentor new students and staff.
- A mission-driven, stable, collaborative, highly interdisciplinary, and supportive work environment.

Interested candidates should submit a cover letter with CV to Bennet Meyers (bennetm@slac.stanford.edu) and Stephen Boyd (boyd@stanford.edu).

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