Applied Energy Division:

Postdoctoral position focused on rapid decision-making in complex, dynamic control environments

Position Overview:

The Applied Energy Division is currently seeking a postdoctoral scholar to support research efforts in developing solutions that address challenges in response to the introduction of novel controls, faster variable-observation and decision-making requirements, and more complex, dynamic environments. The candidate is expected to be proficient in the following areas: human subject study, human-machine interactions, human factor analysis, and human control performance modeling.

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 include a strategic focus on batteries and energy storage, the power grid, water desalination, solar energy, 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.

The candidate will participate in engineering and scientific research, and is expected to lead the development of models and simulations of complex systems with humans "in the loop" in the context of light source facility operations. Successful candidates are expected to conduct systematic literature reviews, propose and implement methodologies for simulation, modeling, and analysis of human-machine interactions and control performance of light source facilities. Postdoctoral researchers are responsible for authoring reports, presenting findings, and supporting proposal writing efforts in the GISMo group.

Specific responsibilities include but are not limited to:

- Work with the current and potential future basic energy sciences community to achieve the highest possible impact from the human-in-the-loop project;
- Conceptualize design, implement, and validate solutions for complex/distributed engineered systems independently;
- Understand and model a variety of light source facility control components;
- Develop, test and document large scale system architectures, models, simulations, and implementations; maintain and update documentation as needed;

- Provide technical analysis, design, development, conversion, and implementation support for complex systems;
- Present research motivation, methods, analyses, results and conclusions.
- Work as a task leader, as needed, for tasks of moderate complexity; and
- Serve as a technical resource for project managers.

Qualifications:

- Ph.D. degree in Engineering, Computer Science, or related fields and has research experience in human-in-the-loop systems.
- Experience developing and delivering research activities, including progress reports, proposals, and presentations to diverse stakeholders.
- Publication record in refereed journals in relevant fields.
- Carry out independent research and collaborate closely with colleagues conducting research.
- Demonstrated experience with human-machine interaction and cognition studies.
- Knowledge of human subject studies design, psychophysiological measurement, data processing, statistics, and data-driven engineering.

In addition, preferred requirements include:

- Experience in mathematical modeling of human and engineered systems.
- Experience in hypothesis testing in human-machine interaction studies.
- Experience investigating human-machine topics, including cognition, errors, mental models, trust, training, stability, observability, controllability and reliability.
- Ability to define and solve logical problems for highly technical applications.
- Strong communication skills with both technical and non-technical clients.
- Ability to lead activities on structured team development projects.
- Ability to select, adopt and effectively use a variety of engineering methods.
- Knowledge of continuous and discrete-time control system modeling, design, optimization and performance analysis.
- Experience managing individual project priorities, deadlines and deliverables.
- Flexibility and interest to work independently in a dynamic, startup environment.

Interested candidates should submit a cover letter with CV to Wan-Lin Hu (wanlinhu@slac.stanford.edu).
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