Postdoctoral Fellow
(Machine Learning Scientist for Meteorological Applications)
20-122

The Cooperative Institute for Research in the Atmosphere (CIRA) on the Foothills Campus at Colorado State University (CSU) in Fort Collins, CO seeks to hire a Postdoctoral Fellow to work at the intersection of machine learning and atmospheric science. This fellowship is part of the new NSF AI Institute for Research on Trustworthy AI in Weather, Climate, and Coastal Oceanography (AI2ES) - one of five newly-funded AI institutes in the US and the only one focusing on environmental science applications (https://www.ai2es.org/). AI2ES is a large multi-institutional and interdisciplinary institute that seeks to uniquely benefit humanity by developing novel, physically based AI techniques that are demonstrated to be trustworthy, and will directly improve prediction, understanding, and communication of high-impact environmental hazards.

This Postdoctoral Fellowship is a 12-month appointment with a flexible start date between February 2021 and July 2021, and option to renew for up to two additional years contingent upon performance and funding. The individual in this fellowship will explore how best to utilize machine learning approaches, including explainable AI methods and physics-guided machine learning, for meteorological applications. Focus will be on, but not limited to, working with satellite imagery. The goal is to improve both predictive abilities for high-impact weather and understanding of atmospheric processes, with key emphasis on the application of tropical cyclones, including tropical cyclone evolution and rapid intensification. Additional meteorological applications will be considered based upon the fellow’s interests and CIRA’s needs. The individual in this fellowship will report to CIRA’s Machine Learning Lead and Research Professor in Electrical and Computer Engineering, and work closely with the lead of CIRA’s Tropical Cyclone Group. The individual in this fellowship will be expected to establish strong collaborations with CIRA & NOAA research staff and members of the AI2ES team in CSU’s Computer Science and Atmospheric Science departments, as well as other AI2ES partner institutions. This is an exciting, high-impact position that provides a great opportunity for a motivated researcher to push the boundaries of AI research in several weather/climate applications and to explore innovative approaches while working in a highly stimulating and interdisciplinary team environment.

Decision Making:
The individual in this fellowship will execute a plan of research that resonates with the underpinning science objectives of the supporting project. The decisions they make, and the approaches taken will be determined by the individual’s own scientific acumen and in consultation with the Principal Investigator. Successful execution of the proposed research, i.e. supporting the deliverables mentioned in the project’s statement of work, will hinge on the definition of a scientifically-sound plan and its execution. This decision-making process will lay a foundation that will be critical for success in future proposals and will build an independent and self-sufficient research program. Similarly, the individual in this fellowship will conduct their research with an eye toward establishing strong partnerships with CIRA research staff, AI2ES partners, and operational partners.

Essential Job Duties:
Applied Research 50%
• conduct research and develop machine learning techniques for weather forecasting applications primarily focusing on tropical cyclones, but also exploring other applications that build on satellite imagery;
• coordinate and collaborate with other team members towards other machine learning applications in weather and climate modeling.

Independent Research 20%
• contribute to and lead scientific studies that serve the CIRA mission;
• develop future proposals that may lead to an independent research program.

Collaborative Research 20%
• engage with operational partners and product end users;
• collaborate with other CIRA scientists and AI2ES team members working on related research projects.

Documentation & Reporting 10%
• travel to scientific conferences to present results;
assist with all NSF-related reporting duties related to this project;  
develop and collaborate on the dissemination of results through publications.

Required Qualifications:
Please detail each of these items in your cover letter.
- Ph.D. in atmospheric science, computer science, mathematics or closely related field;
- demonstrated experience with applied machine learning and/or advanced statistical techniques;
- demonstrated experience working on an application from the physical sciences;
- experience reading, writing, and manipulating scientific datasets, preferably using Python;
- ability to perform research independently;
- ability to work well in a team environment;
- good communication skills.

Preferred Qualifications:
Please highlight applicable preferred qualifications in your cover letter.
- experience applying machine learning in atmospheric sciences or a closely related field;
- familiarity with tropical cyclone forecasting process, tropical cyclone structure and evolution;
- enthusiasm for working with satellite imagery;
- knowledge of high-performance computing;
- experience collaborating across disciplines.

Annual Salary: $59,000 - $60,000

Background Check:
Colorado State University (CSU) strives to provide a safe study, work, and living environment for its faculty, staff, volunteers and students. To support this environment and comply with applicable laws and regulations, CSU conducts background checks. The type of background check conducted varies by position and can include, but is not limited to, criminal (felony and misdemeanor) history, sex offender registry, motor vehicle history, financial history, and/or education verification. Background checks will be conducted when required by law or contract and when, in the discretion of the university, it is reasonable and prudent to do so.

Commitment to Diversity and Inclusion:
Reflecting departmental and institutional values, candidates are expected to have the ability to advance the Department's commitment to diversity and inclusion.

Application Deadline and How to Apply:
Applications will be accepted until the position is filled; however, to ensure full consideration applications should be submitted by 11:59 PM MT on Monday, February 8, 2021. References will not be contacted without prior notification of candidates. Apply electronically by clicking “Apply to this Job” at the following website: https://jobs.colostate.edu/postings/82932. NOTE: In your cover letter, please specifically address the required and preferred qualifications of this position. A cover letter that fails to address the required and preferred qualifications of this position may not be further considered after review by the search committee.