



Two Postdoctoral Scholar Positions, Pritzker School of Molecular Engineering University of Chicago: Artificial intelligence and cyberphysical approaches for agriculture and soil science

We have immediate openings for two postdoctoral scholars who would be part of the new NSF-USDA Center on Artificial Intelligence for Future Agricultural Resilience, Management, and Sustainability (AIFARMS), <https://digitalag.illinois.edu/research/aifarms/>. The Center is a multi-institution-based program that brings together computer scientists, soil and plant scientists, and sensor researchers to advance foundational AI and use these advances to address important challenges facing world agriculture. We seek two postdoctoral scholars who are interested in a data driven, multidisciplinary approach that examines problems in soil science at a system level in the context of environmental and agricultural impact. The positions offer the opportunity to work closely with faculty and researchers at the University of Chicago, Argonne National Laboratory, The University of Illinois at Urbana-Champaign and Michigan State University. The candidates should have particular interest in new science and technology for environmental and food sustainability.

Position 1: Postdoctoral Scholar, experimentalist who will work on developing new AI/machine learning approaches for application in agricultural issues including soil health, nutrient loads, and environmental sustainability. In this role the candidate will carry out experiments at three pilot “digital agricultural” farms/sites to characterize and study underlying biogeochemical transformations and quantify budgets of N and P in Midwest agricultural fields. The research includes designing and deploying new wireless soil sensor networks that we have developed and implemented, building databases for soil moisture, N and P fluxes of Midwest agricultural fields, and connecting the experimental data to AI informed models for predicting N, P and other geochemical transformations at a system level.

Seeking candidates with a Ph.D. in agronomy, terrestrial ecology, biogeochemistry, soil science, ecosystem science, ecohydrology, geophysics, engineering, computing science, or related fields. The following skills are desirable:

- Knowledge of soils, agricultural management practices, soil methods, and/or management of soil sensors.
- Experience with relevant laboratory and field instrumentation and methodologies including N and P flux measurements.
- Experience and/or interest in AI/ machine learning techniques
- Strong ability to coordinate between field and laboratory work, and ability/interest in working in multi-disciplinary team environments.

Position 2: Postdoctoral Scholar will work closely with computer scientists, soil scientists, systems modeling experts, and sensor experts to develop new AI approaches for application in agricultural issues including soil health, nutrient loads, and environmental sustainability. Of particular interest are multi-input machine learning models for accurate predictions of soil N and P fluxes and crop productivity of Midwest agricultural fields. This research will include exploring new algorithms and technique development for using AI with geospatial datasets, such as those for agriculture and the environment, that are “physical sciences” informed, and can make use of datasets that can be sparse.



Seek candidates with a Ph.D. in computing science, the physical sciences, statistics, or a related field. The following skills are needed or desirable:

- Experience in data management, and an interest in fusing AI approaches with the physical sciences.
- Ability to work with a multi-disciplinary team.
- Knowledge of soils and/or agricultural management practices is desirable but not necessary, as long as there is a willingness to learn.

The research efforts will be carried out at both laboratories at Argonne National Laboratory and the University of Chicago in conjunction with field sites at University of Illinois at Urbana Champaign and will provide the opportunity to work and interact with scientists at these three locations, as well as Michigan State University.

Interested candidates should send a CV to Supratik Guha (guha@uchicago.edu) and cc Roser Matamala (matamala@anl.gov).

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