Graduate Research Assistantship (PhD & MS Levels) in Soil Hydrology and Dynamic Soil Survey - University of Florida

The Department of Soil, Water, and Ecosystem Sciences (SWES) at the University of Florida (UF), Gainesville is seeking a highly motivated PhD and an MS student to work on a research project funded by USDA-NRCS (U.S. Department of Agriculture – Natural Resources Conservation Service) beginning in <u>Summer semester 2023</u> (or fall semester 2023). The project is a cooperative effort between the UF and the NRCS scientists. The PhD student will join the Soil Physics and Hydrology laboratory (this position was already filled), and <u>the MS student will join the Pedometric, Landscape Analysis, and GIS laboratory.</u>

Project Description

A key to understanding the sensitivity of the water cycle to climate change is quantifying the future states of soil moisture, as a key hydrologic state variable that controls various hydrologic processes including evaporation, transpiration, infiltration, runoff, and subsurface flow. It is important for numerous hydrological, ecological, climatological, and agriculture applications, as well as to improve our understanding of the water, energy, and carbon cycles. Significant advances in satellite remote sensing of soil moisture and availability of nationwide dynamic soil survey together with advances in state-of-the-art data-driven models provide an exceptional opportunity for understanding the effect of climate change on soil moisture dynamics. The project aims to develop novel physical models that integrate multisource multiscale satellite remote sensing observations (optical, thermal and microwave), nationwide NRCS soil survey database, atmospheric forcings, and Artificial Intelligence techniques (machine learning and deep learning) to model and map real-time soil moisture dynamics with high spatiotemporal resolution while accounting for uncertainties in the contiguous U.S. (pedometrics research).

The successful candidate is expected to contribute to the collection and analysis of large in-situ and satellite datasets, development of physics-informed deep learning (hybrid) models for real-time profile soil moisture monitoring, and to the dissemination of research findings through peer-reviewed journal articles and presentations at scientific meetings/conferences.

Required Qualifications

- Bachelor or Master degrees in Soil Science, Hydrology, Civil engineering (Water Resources), Earth/Atmospheric Science, Agricultural and Biological Engineering, Remote Sensing, or closely related fields.
- Strong previous academic performance.
- Excellent programming and computational skills (Python, MATLAB, or R).
- Excellent oral and written communication skills (non-native English speakers please see here for TOEFL/IELTS requirements).

Preferred Qualifications

- Prior experience in hydrological modeling, remote sensing, geospatial analysis, and machine learning.

- Experience in cloud computing and analyzing large data sources.

Application Process

Applicants are required to contact Dr. Ebrahim Babaeian at ebabaeian@ufl.edu or Dr. Sabine Grunwald at sabgru@ufl.edu and provide their detailed CV, a statement of research experiences and interests, unofficial transcripts, and the contact information for three references (with the email title "*Inquiry about PhD/M.Sc. Position*"). The review of applications starts immediately and will continue until the position is filled. Only shortlisted candidates will be contacted and interviewed virtually. The selected candidate(s) will submit a formal application to the Department of Soil, Water, and Ecosystem Sciences (SWES) graduate program (See here for details) ASAP. Individuals from underrepresented backgrounds and minority students are strongly encouraged to apply.

For facts about the University of Florida and its core values please see here.