**Postdoctoral position in modeling soil nitrous oxide emission using artificial intelligence**

**Position description:** Department of Biosystems Engineering and Soil Science at the University of Tennessee-Knoxville has an opening for a grant-funded postdoctoral position with training in soil greenhouse gas emissions (with strong focus on nitrous oxide, N2O), biogeochemistry, data science, predictive modeling using machine learning and deep learning, or related discipline. The main goal of this position is to synthesize a large database, largely focused on assimilating highly resolved soil N2O fluxes and associated metadata obtained from automated chamber-based measurements in managed systems, as provided by the global data contributors. The goal is to train AI models by leveraging this database for improved predictability and explainability of N2O emissions in relation to complex covariate interactions and generating novel insights to inform the process-based models. This position offers a unique opportunity to work with multiple project partners from other institutions (Penn State, Michigan State University) with diverse expertise in machine learning, soil science, agronomy, and process modeling.

**Responsibilities:** The incumbent will synthesize a scaled global database of temporal N2O fluxes and associated metadata into a relational database to support data-driven modeling within and beyond this project. The postdoc will coordinate with the project collaborators from Michigan State University to lead the database development. We will also gather and extract intermittent flux chamber data and metadata directly from the voluminous N2O flux literature that represent a sound gas sampling strategy (study duration and frequency) as well as from the available databases such as USDA’s GRACEnet and the Global N2O Database. Due to variety of data format across different sources, the postdoc will develop a scaled and standardized database structure such that data from across different publications can easily be queried, compared, and readily imported by the machine learning modeling workflow. The final database will follow the FAIR (Findable, Accessible, Interoperable, and Re-usable) data standards and uploaded to a public repository with a unique identifier and rich metadata. The position is based in Knoxville, TN. The postdoctoral associate should be able to work independently as well as in a diverse team. The postdoc will be responsible for daily project management and coordinating with the multi-institutional project collaborators to track progress. This is a full-time, two-year appointment depending on available funding and satisfactory performance. Salary and benefits are competitive.

**Required qualifications:**

* Completed Ph.D. degree in soil science, agronomy, computer science or related fields, with data science application would be a plus. Candidates in the process of obtaining their degree will be considered but the degree must be conferred prior to date of hire.
* Expertise in developing and managing large, structured, scaled, and searchable MySQL database containing multiple relational tables.
* Experience in using machine learning and deep learning models.
* Evidence of high-quality peer-reviewed publications in subject areas relevant to the project
* Expertise in data analysis in R or Python.
* Evidence of independence and creativity in conducting research

**Open date**: Immediately

**Application:** Interested candidates should complete an online application here: <https://ut.taleo.net/careersection/ut_system/jobdetail.ftl?job=230000021E&tz=GMT-04%3A00&tzname=America%2FNew_York>,

and submit 1) a letter of interest describing the applicant’s suitability for the position and research interests, 2) curriculum vitae, 3) copies of graduate transcripts, 4) contact information for three references

For more details about the position, contact Dr. Debasish Saha (email: dsaha3@utk.edu). Other project partners include Drs. Armen Kemanian (Penn State), G. Philip Robertson (Michigan State University), and Subhadeep Chakraborty (University of Tennessee)