

Rouhin Mitra

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EDUCATION

- Ph.D in Civil and Environmental Engineering, University of California, Los Angeles 2021-2024 (December)
 - GPA: 3.85/4.00 — Data-driven agricultural water management
- M.S in Civil and Environmental Engineering, University of California, Los Angeles 2019-2021
 - GPA: 3.87/4.00 — Hydrology and Environmental Engineering track
- B.Tech in Civil Engineering, Manipal Institute of Technology, India 2015-2019
 - GPA: 8.86/10.00 — Ranked 12 among 200 students. 1 of 10 to receive Honors

PROJECTS

Satellite based agricultural water management and monitoring PhD Dissertation

- Developed an agricultural water demand correction method to conserve irrigation water by 9.3% using satellite and weather/meteorological data with machine learning models (XGBoost, Random forest)
- Processed in-situ high frequency flux data for energy balance closure and quality control to perform validation of satellite based models
- Created end to end geospatial workflows to run a high resolution satellite based evapotranspiration model to enable field scale water use mapping in US at 30m
- Applied data driven models and physics informed machine learning to combine satellite based model outputs and observations to improve the existing model by 3.8%
- Building an end to end tool that can show growers their weekly water demand and water use in real time in data scarce regions in East Africa

Streamflow Prediction in Western US using Land Surface Models [presentation](#)

- Worked on improving the predictability of summer flows in western US watersheds using land surface models
- Processed drought monitor for western US and ran a land surface model (VIC) using large gridded weather data-sets
- Used unsupervised learning and multiple linear regression to assess the role of soil moisture in summer flow predictions for maritime and interior basins

EEG-based Motor Imagery Classification using Deep Learning Architectures [paper](#)

- We processed brain-computer interface data that captures brain signals of subjects when interacting with a machine where our task was to improve the accuracy to classify the different movements using these signals
- Using different deep learning architectures, we boosted the baseline accuracy of a CNN model from 66% to 72% by using a transformers architecture

WORK EXPERIENCE

International Research Experience (NSF) 📍 Rwanda, Africa Jun-Aug 2022

- Worked with stakeholders and agronomists of cooperatives to collect data extensive crop data in three pilot sites
- Installed field sensors such as weather stations and soil moisture probes on to support field data with sensor data to boost water use monitoring at the plots. (Team of 3)
- Facilitated geolocation of 50+ Rice fields for yield mapping using ArcGIS and Google Earth Engine (Team of 6)

TECHNICAL SKILLS

Languages: Python (Pandas, Numpy, Scikit-learn, Keras, PyTorch, Tensorflow, Xarray, GDAL), R, Javascript

Engineering: Google Earth Engine, Google Cloud Platform, Apache Beam, Dataflow, Jupyter, Git, ArcGIS, ENVI

PUBLICATIONS AND SELECTED PRESENTATIONS

Haleakala, Kayden, Haowen Yue, Sarfaraz Alam, **Rouhin Mitra**, Ageel I. Bushara, and Mekonnen Gebremichael. "The evolving roles of intensity and wet season timing in rainfall regimes surrounding the Red Sea." *Environmental Research Letters* 17, no. 4 (2022): 044039 [paper](#)

Mitra, Rouhin, M Gebremichael "Satellite based Evapotranspiration over croplands: Quantifying errors in surface energy balance methods and algorithmic improvements?", AGU Fall Meeting, 2023

Mitra, Rouhin, M Gebremichael "A Random Forest Approach to Correct weather stations for Aridity", Google, Geo for Good 2022

Mitra, Rouhin, C. Kayijuka, V Nkundabashaka, M Thomas, V Fritz, N Rose, UM Grace, M Gebremichael, L Gezehegn "Can Remotely Sensed Evapotranspiration be used for yield prediction and water stress detection in footnotesizeholder rice fields?", AGU Fall Meeting, 2022