Enhancing characterization of trends in large floods and flood forecasting

The One Water Solutions Institute (OWSI) at Colorado State University (CSU) is seeking a motivated PhD graduate research assistant to join an intellectually exciting and socially impactful sponsored research project. The goal of this assistantship is to develop and implement advanced science-guided ensemble machine learning to improve forecasting of temporal trends in large floods due to changes in the underlying climatic, physiographic, and ecohydrologic conditions, within the constraint of flood potential zones.

This research is intended to enhance capabilities of the Flood Potential Portal (https://floodpotential.erams.com/), a decision support system that enhances understanding of flood variability and quantifies peak discharge magnitudes used for infrastructure design and floodplain management. This software was developed by the U.S. Forest Service and OWSI to assist practitioners with assessments to support infrastructure decisions, including designing road-stream crossings.

Required qualifications are:

- MS in Civil and Environmental Engineering or related discipline.
- Clear research interest in statistical hydrology, data sciences, and modeling.
- Proficiency in oral and written English communication.

Preferred qualifications for this position are:

- Experience with coding in Python, R, Matlab, or other programming languages.
- Experience with statistical and probability methods for flood frequency analysis.
- Experience with geographic information systems (GIS) such ESRI's ArcGIS Pro.
- Research experience in water resources science or engineering.
- Demonstrated ability to work effectively in teams.
- Demonstrated ability to write and publish original research.

If interested, contact **Prof. Mazdak Arabi (madak.arabi@colostate.edu)** with the following materials as a single PDF attachment and email subject line "Application for PhD Position – Enhancing characterization of trends in large floods and flood forecasting":

1) A 1–2-page cover letter with your interest in the position and research topics, and how you meet the required and preferred qualifications, and
2) A current resume or CV.

Ensemble modeling for enhanced flood frequency analysis

The One Water Solutions Institute (OWSI) at Colorado State University (CSU) is seeking a motivated PhD graduate research assistant to join an intellectually exciting and socially impactful sponsored research project. The goal of this assistantship is to develop and implement ensemble modeling for streamgage flood-frequency analysis, to address shortcomings of existing state-of-practice methods including assumptions about stationarity and identically-distributed observations. A key issue to address is data bimodality and multi-modality (mixed populations), and to mitigate bias induced by the single-modality assumption.

This research is intended to enhance capabilities of the Flood Potential Portal (https://floodpotential.erams.com/), a decision support system that enhances understanding of flood variability and quantifies peak discharge magnitudes used for infrastructure design and floodplain management. This software was developed by the U.S. Forest Service and OWSI to assist practitioners with assessments to support infrastructure decisions, including designing road-stream crossings.

Required qualifications are:

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- Clear research interest in statistical hydrology, data sciences, and modeling.
- Proficiency in oral and written English communication.

Preferred qualifications for this position are:

- Experience with coding in Python, R, Matlab, or other programming languages.
- Experience with statistical and probability methods for flood frequency analysis.
- Experience with geographic information systems (GIS) such ESRI's ArcGIS Pro.
- Research experience in water resources science or engineering.
- Demonstrated ability to work effectively in teams.
- Demonstrated ability to write and publish original research.

If interested, contact **Prof. Mazdak Arabi (madak.arabi@colostate.edu)** with the following materials as a single PDF attachment and email subject line "Application for PhD Position – Ensemble modeling for enhanced flood frequency analysis":

1) A 1–2-page cover letter with your interest in the position and research topics, and how you meet the required and preferred qualifications, and
2) A current resume or CV.