Faculty Member Contact Information

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Contact Info	
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Department	Civil

1 Funded, 2 Unfunded URCA Assistant

	This position is **ONLY** open to students who have declared a major in this discipline.	
	This project deals with social justice issues.	
X	This project deals with sustainability (green) issues.	
	This project deals with human health and wellness issues.	
	This project deals with community outreach.	
X	This mentor's project is interdisciplinary in nature.	

Are you willing to work with students from outside of your discipline? If yes, which other disciplines?

Yes

How many hours per week will your student(s) be required to work in this position?
(Minimum is 6 hours per week; typical is 9)

9

Will it be possible for your student(s) to earn course credit?

Location of research/creative activities:

Engineering Building

Brief description of the nature of the research/creative activity?

Performance of Machine Learning models to predict stream water quality parameters

Surface water such as rivers, streams and lakes are the primary sources for drinking, industrial, agricultural use, and energy production. Maintaining high water quality is important for human health, recreation activities and functional ecosystem processes. These water quality parameters are measured at different USGS gage stations including discharge, Monitoring water quality informs the status of water quality (e.g., dissolve oxygen, pH, temperature, salinity, etc.) in streams but it is expensive and time consuming. Therefore, our study is focused on the application of different machine learning (ML) models and their performance for prediction water quality parameters such as dissolve oxygen (DO) based on other readily available parameters such as salinity, water temperature, pH, etc. We will use USGS measured water quality parameters to train and test ML models to analyze performance of these models.

Brief description of student responsibilities?

- Literature search on stream water quality and application of ML models.
- Download water quality parameters measured at different USGS gage stations around the US.
- Assist graduate students and faculty preparing data to develop ML models and performance analyses.
- Assist faculty and graduate students to develop manuscript for conference proceeding and peer-reviewed journal articles.

URCA Assistant positions are designed to provide students with *research or creative activities* experience. As such, there should be measurable, appropriate outcome goals. What exactly should your student(s) have learned by the end of this experience?

- Knowledge of water quality and importance for ecosystem processes.
- ML models and their application for prediction water quality parameters
- Data analyzing skills using excel program and statistical analyses
- Writing scientific papers
- Teamwork

<u>Requirements of Students</u>

If the position(s) require students to be available at certain times each week (as opposed to them being able to set their own hours) please indicate all required days and times:

Work hour is flexible

If the location of the research/creative activities involves off campus work, must students provide their own transportation?

If need to travel in field around Edwardsville SIUE campus, vehicle will be provided.

Must students have taken any prerequisite classes? Please list classes and preferred grades:

NA

Other requirements or notes to applicants:

Interest in research and motivation