Environmental and Water Resources Engineering Seminar Series Presents:

Thursday, September 26th 2024, 3:30-4:30pm, ECJ 1.308

Surface Water Quality Protection in Central Texas

Clint Smith, PE, CFM, M. ASCE
Master of Science in Civil Engineering, University of Texas at Austin

Bio: Clint Smith, PE, CFM, M. ASCE is a Water/ Wastewater Project Manager with Halff Associates in Austin, Texas working on large-scale watershed studies, water and wastewater modeling, and surface water quality analysis projects. Clint graduated with his BS in Civil Engineering from the University of Alabama in 2017 and his MS in Civil Engineering in 2018. Clint is the Chair Elect for ASCE's Committee of Younger Members, the President of the ASCE Austin YMF, ASCE Austin Branch DEI Chair, and serves as the Vice Chair for MOSAIC (ASCE's DEI Committee) and the EWRI Technical Committee on Stormwater Filtration nationally. Clint was awarded the A. Ivan Johnson Award for Young Professionals from the American Water Resources Association in 2023. He additionally is a journal reviewer for the Transportation Research Board's Hydrology, Hydraulics, and Stormwater Committee.

Abstract: Surface water quality is a priority in central Texas. There are several different entities within central Texas who require that stormwater to be treated prior to being discharged into streams, rivers, and lakes. Looking into various regulations throughout the area as well as plans for the future, the desired treatment strategies have varying efficiencies and applications. This presentation will cover applications and projects throughout the region and how municipalities are protecting source waters that lead to our water supply.

Stormwater digital twin with online quality control detects urban flood hazards under uncertainty.

Yeji Kim
Current PhD Student in the EWRE Program
Advisor: Dr. Matt Bartos

Bio:
Yeji works with Dr. Bartos in the Future Water Systems Lab whose research focuses on implementing digital twins in water systems, specifically in stormwater monitoring and water distribution systems.

Abstract:
Urban drainage systems are increasingly vulnerable to floods and sewer overflows due to climate change and urban growth. To address these challenges, cities are developing stormwater digital twins that integrate sensor data with hydraulic models for real-time decision-making. However, unreliable sensors, imperfect models, and inaccurate rainfall forecasts complicate this process. In this study, we present a stormwater digital twin using online data assimilation to estimate water depths and discharges under sensor and model uncertainty. The system's performance was evaluated through a long-term deployment in Austin's flood-prone Waller Creek watershed, effectively rejecting sensor faults, improving stormwater depth estimates at ungaged locations, and delivering more accurate near-term forecasts.

EWRE Seminar Committee Members: Azalea Norwood, Elle Henson, Hiromu Koyama, Priyanshu Gupta, and Zijie Zheng
Supervising Faculty: Dr. Kerry Kinney