Abhiram Mullapudi

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Experience

Senior Data Scientist, *Xylem* 2023–Present

I design and implement end-to-end machine learning-based solutions that inform decision-making in urban water infrastructure systems.

- Leading the development of statistical and machine learning-based methodologies for time-series filtering and anomaly detection for predictive maintenance and operational decision-making.
- Currently developing a Flyte-based MLOps platform to streamline end-to-end machine learning model development, deployment, and maintenance for Xylem's digital water products.

Hydraulic Control and Optimization Engineer, *Xylem* 2020–2023

Pioneered advanced machine learning and data engineering solutions for urban water infrastructure, transforming raw sensor data into actionable intelligence that optimizes water network performance.

- Developed a 1D-CNN model that leverages NOAA rainfall forecasts and near-real-time flow measurements to accurately predict 24-hour inflow to water treatment plants.
- Engineered an advanced 1D-CNN interpolation framework for processing spatially distributed river level data, enabling comprehensive environmental monitoring.
- Designed a high-performance real-time processing system leveraging symbolic programming and advanced statistical techniques to detect network irregularities across 600+ concurrent data streams.

Publications

Identification of stormwater control strategies and their associated uncertainties using Bayesian Optimization 2023
arXiv preprint

pystorms: a simulation sandbox for the design and evaluation of stormwater control algorithms 2023
Environmental Modelling and Software

Improvement of phosphorus removal in bioretention cells using real-time control 2022
Urban Water Journal

StormReactor: An open-source Python package for the integrated modeling of urban water quality and water balance 2021
Environmental Modelling & Software

Deep Reinforcement Learning for the Real Time Control of Stormwater Systems 2020
Advances in Water Resources

Education

Ph.D. in Civil Engineering
2017–2020 University of Michigan
Statistical Learning Approaches for the Control of Stormwater Systems
Advisor: Dr. Branko Kerkez

M.Sc.Eng. in Civil Engineering
2015–2017 University of Michigan

B.Tech. in Civil Engineering
2011–2015 Amrita Vishwa Vidyapeetham

Skills

Programming
Python, MATLAB, C/C++, LaTeX, SQL, Bash

ML & Data Science
PyTorch, TensorFlow, JAX, scikit-learn

Cloud & MLOps
MLflow, Flyte, AWS, Google Cloud, Azure

Awards

LIFT Intelligent Water Systems Challenge
Grand Prize Winner, 2019

Academic Excellence
Amrita Vishwa Vidhyapeetham, 2013, 2015

Projects & Software

pystorms Creator
An open-source Python library for the design and evaluation of stormwater control algorithms.

pyswmm Maintainer
The Python interface to Stormwater Management Model (SWMM), the industry standard for modeling stormwater systems.

rrcf Contributor
An open-source implementation of the Robust Random Cut Forest algorithm for anomaly detection on streams.