

DI ZHU

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RESEARCH INTERESTS

My current research focuses on developing systems to enable in-network computations for AI/ML applications in modern datacenter networks. I'm also interested in building in-network computing systems using heterogeneous hardware such as programmable switches, FPGA, and photonic devices.

EDUCATION

University of Virginia

Ph.D. in Computer Science

Advisor: Prof. Hyojoon Kim

Charlottesville, VA, USA

Aug. 2022 – May 2027 (Expected)

College of William and Mary

Ph.D. in Computer Science

Williamsburg, VA, USA

Attended Aug. 2020 – June 2022

Boston University

Master of Science in Computer Science

Boston, MA, USA

Aug. 2018 – Jan. 2020

Sichuan University

Bachelor of Engineering in Computer Science

Chengdu, Sichuan, China

Aug. 2014 – June 2018

PUBLICATIONS

- **Zhu, Di**, and Hyojoon Kim. "Automating Distributed In-network Classification with Runtime Programmability." In Proceedings of the CoNEXT on Student Workshop 2024, pp. 27-28. 2024.
- Islam, Md Khairul, **Di Zhu**, Yingzheng Liu, Andrej Erkelens, Nick Daniello, and Judy Fox. "Interpreting County Level COVID-19 Infection and Feature Sensitivity using Deep Learning Time Series Models." arXiv preprint arXiv:2210.03258 (2022).

PROJECTS

In-network Inference with Photonic Hardware

Apr. 2024 – Present

- Built a photonic data plane based on a physical testbed with one laser source, two modulators, one photodetector, one FPGA, and other necessary components.
- Learning how to program the FPGA to control the photonic testbed with Xilinx Vivado and Verilog programs.

Automating Distributed In-network Classification with Runtime Programmability

Apr. 2024 – Present

- Designed an end-to-end system, ACORN, that automatically translates Python Scikit-learn ML models to table representations, optimizes table deployment plans, and deploys ML models to the network based on user configurations.
- Wrote a paper titled "Automating Distributed In-network Classification with Runtime Programmability" and published it on ACM CoNEXT 2024 Student Workshop.
- Conducting evaluations and writing a full paper titled "Automating Distributed In-network Classification with Runtime Programmability" to submit to NSDI 2026.

Synthetic System Log Generation

Mar. 2023 – Oct. 2023

- Performed empirical study to prove the negative impact of data imbalance on ML/DL-based anomaly intrusion detection systems.
- Performed system entity abstraction for subjects based on process names, and for objects based on paths, IP addresses and port numbers, and classified system entities into finer-grained categories.
- Constructed a WGAN-based model to generate synthetic subject entities as well as synthetic relevant edges based on features extracted from k-hop neighbors of existing subject nodes.

County Level COVID-19 Infection Forecasting and Interpretation

Feb. 2022 – Jan. 2023

- Modeled COVID-19 infection using Temporal Fusion Transformer from 02/2020 to 11/2021 and predicted COVID-19 cases from 12/2021 to 05/2022.
- Extended the Morris Method for multidimensional spatial-temporal data and studied individual feature sensitivity using the Morris Method.
- Stratified county-level population from socioeconomic and health data, and studied sensitivity for each population groups.
- Wrote a paper titled "Interpreting County Level COVID-19 Infection and Feature Sensitivity using Deep Learning Time Series Models" and published it on arXiv.

TEACHING EXPERIENCE

University of Virginia

Graduate Teaching Assistant - CS/ECE 4457 Computer Networks	Spring 2025
Graduate Teaching Assistant - CS/ECE 7457 Advanced Computer Networks	Fall 2024
Graduate Teaching Assistant - CS/ECE 4457 Computer Networks	Spring 2024
Graduate Teaching Assistant - CS 4630 Defense Against the Dark Arts	Fall 2023

William & Mary

Graduate Teaching Assistant - CSCI 303 Algorithms	Spring 2022
Graduate Teaching Assistant - CSCI 140 Programming for Data Science	Fall 2021
Graduate Teaching Assistant - CSCI 303 Algorithms	Spring 2021
Graduate Teaching Assistant - CSCI 303 Algorithms, CSCI 435 Software Engineering	Fall 2020

Boston University

Grader - CAS CS 440 Artificial Intelligence	Spring 2019
Grader - CAS CS 330 Introduction to Analysis of Algorithms	Fall 2019

PROFESSIONAL SERVICES

Journal Reviewer, Big Data Research

AWARDS

Travel Grant, CoNEXT 2024

Second-class Scholarship, Sichuan University 2017

Third-class Scholarship, Sichuan University 2016

National Scholarship, Sichuan University 2015

First-class Scholarship, Sichuan University 2015

TECHNICAL SKILLS

Software Defined Networks: P4-16 (TNA), Intel P4 Studio, Barefoot Runtime Interface, Tofino-Model, Lucid

Artificial Intelligence: Python, PyTorch, Tensorflow, Scikit-learn, NumPy, Pandas

Other: Java, C++

Learning: Xilinx FPGA, Vivado, Verilog, Photonic Device