Fadhil I. Kurnia

140 Governors Dr, Amherst, MA 01002 | fikurnia@cs.umass.edu | +1 413-404-4598
https://fadhil.id | github.com/fadhilkurnia | linkedin.com/in/fadhilkurnia

RESEARCH INTERESTS

Distributed Systems, Networked Systems, Privacy-preserving Systems, Systems for Machine Learning

EDUCATION

UNIVERSITY OF MASSACHUSETTS AMHERST — 2020 - DEC 2025 (expected)
MS/PhD in Computer Science - CGPA 3.95/4.0 — Amherst, MA, USA

BANDUNG INSTITUTE OF TECHNOLOGY (ITB) — 2015-2019
BSc in Computer Science - CGPA 3.83/4.0 Graduated with Cum Laude Distinction — Bandung, Indonesia

PUBLICATIONS

Replicating Blackbox Stateful Services to Live on the Edge — *under submission, manuscript ready upon request*
Fadhil I. Kurnia, Arun Venkataramani

Oblivious Paxos: Privacy Preserving Consensus Over Secret Shares — ACM Symposium on Cloud Computing (SoCC) 2023
Fadhil I. Kurnia, Arun Venkataramani

Extending and Programming the NVMe I/O Determinism Interface for Flash Arrays — ACM Transactions on Storage (ToS) 2023
Huaicheng Li, Martin L. Putra, Ronald Shi, **Fadhil I. Kurnia**, Xing Lin, Jaeyoung Do, Achmad I. Kistijantoro, Gregory R. Ganger, Haryadi S. Gunawi

RESEARCH EXPERIENCE

Transparent, Efficient, and Privacy-Preserving Distributed Replication Protocols — UMass Amherst | Aug 2020-present
Advisor: Dr. Arun Venkataramani

- Implemented prototypes of Paxos based privacy-preserving consensus protocols: Oblivious Paxos and Fast Oblivious Paxos.
- Developed novel approaches for replicating blackbox web services on Cloud Edge with configurable consistency guarantee.
- Implemented and benchmarked protocols for different consistency levels: linearizability, sequential and causal consistency.

Eliminating Tail Latencies in Flash Arrays with Redundancy — University of Chicago | May 2018-Dec 2019
Advisors: Dr. Haryadi S. Gunawi, Dr. Huaicheng Li

- Implemented RAID-like redundancy in flash arrays to eliminate tail latency, the client sends requests to multiple SSD and proceeds with the fastest responses, using C based SSDSim. Presented the result as my bachelor thesis [code][thesis].
- Added checkpoint messages inside the Linux kernel for measurement purposes. Profiled prototype performance using fio.
- The result is published at SOSP'21 with my name mentioned in the Acknowledgement [paper]. Published in ACM ToS.

INDUSTRY EXPERIENCE

Google - PhD Intern — Sunnyvale, California, USA | May-Aug 2024

- Developed a feature for Bandwidth Enforcer (BwE) to prioritize internal traffic without global information (i.e., network unaware) by downgrading overflow traffic into multiple lower classes while maximizing consistent network class usage.
- Used Python and C++ with an event-driven and parallel Monte Carlo simulator to rigorously analyze the feature, ensuring minimal regression compared to previous enforcement that downgraded traffic to a single lower class, not multiple classes.
- The new multi-class downgrade feature potentially frees up ~25% of bandwidth currently used by overflow traffic, making the bandwidth available for higher priority tasks, like machine learning, that already have their bandwidth quota approved.

Ruangguru - Backend Engineer — Jakarta, Indonesia | Feb-Aug 2020

- Developed and maintained 3 backend services, written in Go, to handle quiz events and online learning platforms, the main feature of the apps, with over 10K req/s. Decreased avg latencies by ~30% with Redis caching layer on top of the services.
- Ensured the correctness of distributed transactions spanning multiple independent backend services. Implemented and registered the rollback mechanism in Cadence, a widely used micro-service orchestrator.
- Initialized LMS development that supports 100+ schools/ organizations and their 100,000+ students during the pandemic.

Bukalapak - Machine Learning Engineer Intern — Bandung, Indonesia | Jan-Mar 2019

- Developed a light middle-layer that intercepts requests and responses to/from machine learning services for the machine learning scientists so they can analyze the deployed machine learning model's accuracy.
- Successfully gathered the prediction results from 5 machine learning services with small latency overhead.
- Tech stack: Go, Python, Kafka, MongoDB, Docker.

Tokopedia - Software Engineer Intern — Jakarta, Indonesia | May-Aug 2017

- Implemented Tokopedia Feed which adds posts to user feed when their favorite shops are listing new products.
- Implemented online mark & last seen feature in Tokopedia Chat website for 1,000,000+ monthly active users.
- Tech stack: Go, PostgreSQL, Redis, NSQ, React JS, Neo4J Graph DB.

TEACHING EXPERIENCE

2022 Fall - Teaching Assistant of CS653-Advanced Computer Networking, University of Massachusetts Amherst.
2021 Spring, Summer - Teaching Assistant of CS187-Programming w/ Data Structure, University of Massachusetts Amherst.

HONORS & AWARDS

2023 Travel Scholarship for ACM Symposium on Cloud Computing (SoCC) 2023, Santa Cruz, California, USA.
2023 Fellowship for EPFL Summer Research Institute (SuRI) 2023 on Systems, Security, and Privacy. Lausanne, Switzerland.
2021 The Jim Gray Graduate Scholarship in Computer Science, CICS, UMass Amherst, USA.
2013 Gold Medal at Infomatrix 2013, international science competition (software), in Bucharest, Romania [national-news].

TECHNICAL SKILLS

Lang: C/C++, Go, Java, Python, PHP, Shell Script DB: MySQL, SQLite, Postgres, Redis Others: Kafka, FUSE, Docker, eBPF