

About

A 2nd year Ph.D. Student interested in the area of Program Correctness, Formal Verification, Distributed System, and Privacy and Security

Education

Johns Hopkins University

Doctor of Philosophy, Computer Science

- Co-Advised by **Prof. Soudeh Ghorbani** and **Prof. Ryan Huang**
- **Research Interest:** Reliability verification of distributed and networked systems
- **Courses:** Practical Cryptographic System, Advanced Networks, Machine Learning, Modern Cryptography

Baltimore, MD, USA

Aug 2021 - Current

Bandung Institute of Technology

Bachelor of Science, Informatics

- **GPA:** 3.62 (Cum Laude)
- Lab Coordinator for the Distributed Systems Lab (2019-2020)

Bandung, Indonesia

Aug 2016 - Jul 2020

Academic Experience

Johns Hopkins University

Teaching Assistant, Intro Algorithms

- Served as a TA for a class of **133 students** together with 10 CAs under **Prof. Gagan Garg**
- Responsible for homework questions and 2 hours / week office hours

Baltimore, MD, USA

Aug 2022 - Current

Johns Hopkins University

Research Assistant, HopNets

- Served as an RA for a network verification project under **Prof. Soudeh Ghorbani**
- Developed a probabilistic network latency verifier to reason about a network's latency SLA

Baltimore, MD, USA

Aug 2021 - Current

University of Chicago

Undergraduate Research Assistant

- Distributed systems reliability research under **Prof. Haryadi Gunawi**
- Developed FastMC, a model checker based on single-JVM system isolation and aspect-based programming
- Improved verification throughput by **2 orders of magnitude** (2400 ev/s) compared to previous model checker in the lab (30 ev/s)

Remote

Jan 2019 - Dec 2020

Bandung Institute of Technology

Teaching Assistant, Distributed Systems Lab

- Served as a TA for **4 classes:** Computer Architecture and Organization, Operating System, Computer Networks, Distributed Systems
- Responsible for tutorial, homework questions, and grading of **100 students** with 5 other TAs

Bandung, Indonesia

Aug 2018 - Jun 2020

Professional Experience

Shopee

Backend Engineer Intern

- A Southeast Asian e-commerce decacorn startup
- Worked on refactoring in-app minigames reward system to a more uniform output that is friendly to the existing Grafana dashboard
- **Tech Stack:** Go, Javascript, Git, GitLab

Jakarta, Indonesia

Nov 2020 - Feb 2021

Gojek

Data Scientist Intern

- A Southeast Asian ride-hailing decacorn startup
- Initiated Simulacrum, an event-based ride market simulation for testing driver incentive schemes
- Simulacrum prototype can process **1000+ orders/s** on average
- **Tech Stack:** Python, scikit-learn, pandas, Anaconda, Jupyter, Git

Jakarta, Indonesia

Dec 2019 - Feb 2020

Kata.ai

Research Scientist Intern

- An Indonesian NLP-based chat-bot startup
- Did research about semi-supervised NLP methods to improve the company's sequence labelling engine
- Handled the experiment and modification of Cross-View Training (Clark et al. 2018) model
- Improved F1 score by 6% (from **86% to 92%**) compared to the previous Named Entity Recognition engine
- **Tech Stack:** Python, TensorFlow, Anaconda, Jupyter, Git

Jakarta, Indonesia

Jun 2019 - Sep 2019

Publications & Manuscripts

Tempus: Probabilistic Network Latency Verifier

Working Manuscript

Senapati S. Diwangkara, Soudeh Ghorbani

- A probabilistic network latency verifier to reason about a network's latency SLA
- Built on top of an existing classical network verifier by **pruning up to 70%** of existing states
- Runs below 5 minutes even for 150 nodes WAN network

Study of Data Imbalance and Asynchronous Aggregation Algorithm on Federated Learning

ICITSI '20

Senapati S. Diwangkara, Achmad Imam Kistijantoro

- Studied the limitation of asynchronous aggregation algorithm in a federated learning environment
- Done via simulated data imbalance and simulated network imperfection (loss rate 0% - 20%)
- Shows that asynchronous algorithm performs best when data is balanced and node staleness is low
- **5 citations, 34 GitHub stars, 7 GitHub forks**

Notable Projects

Darkarts

Anonymous NFT Transfer using ZK-SNARK

Jan 2022 - Current

- An Ethereum mixer contract for ERC-721, inspired by Tornado.cash
- Worked with a teammate from Coinbase Singapore
- **Tech Stack:** Solidity, ZoKrates, Next.js

Clint

Reputation System for Bank Loan

Sep 2019 - Nov 2019

- A proposal for Ethereum-based reputation system for bank loan
- Earned **Top-5 Award** in Finhacks 2019 Hackathon by Bank Central Asia
- **Tech Stack:** Solidity, React.js

SSL Reverse Proxy

nginx + certbot Docker Image

Dec 2018 - Jan 2019

- Docker image of an nginx reverse proxy server with certbot to equip any web service with SSL certificate
- **48 pulls** on Docker Hub
- **Tech Stack:** Docker, nginx

GhettoOS

A 16-bit OS

Jan 2018 - May 2018

- A makeshift 16-bit OS for educational purposes
- Made to fulfill an assignment for an Operating System course at Bandung Institute of Technology
- **Tech Stack:** C, Bochs

Honors & Awards

2020 **111/120**, TOEFL

2020 **Cum Laude**, Bandung Institute of Technology

2019 **Top 5**, Finhacks Blockchainovation Hackathon, by Bank Central Asia


Skills

Systems Programming GNU+Linux systems, Bash and Unix coreutils, C/C++, Java, Go, Docker

Web Development React.js, Next.js, Flask, Node.js, Vercel

Data Science Python (Pandas, NumPy, Jupyter), Julia, Matplotlib, PyTorch, TensorFlow

Miscellaneous Interests

Blogging I like to write some technical and philosophical essays on my blog 

Linux I've been using Arch Linux for my desktop OS since 2017

Android I enjoy exploring and trying various custom ROM for my phone, currently using CalyxOS