



WILLIAM NIXON

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RESEARCH INTERESTS

ML-for-systems, systems-for-ML, operating systems, storage systems, distributed systems.

EDUCATION

University of Chicago

1st Year M.S./Ph.D. Student in Computer Science.

Sep 2025 - Present

Chicago, Illinois

Bandung Institute of Technology

B.S. in Computer Science. GPA: 3.95/4.00.

Jul 2021 - Jul 2025

TOEFL: 115 [30 R, 29 L, 27 S, 29 W]

Bandung, Indonesia

PUBLICATION

S. Cahyawijaya, H. Lovenia, J. R. A. Moniz, T. H. Wong, M. R. Farhansyah, ... **W. Nixon**, ... P. Limkonchotiwat. "**Crowd-source, Crawl, or Generate? Creating SEA-VL, a Multicultural Vision-Language Dataset for Southeast Asia**". In *Proceedings of the Association for Computational Linguistics (ACL)*, 2025.

H. Lovenia, R. Mahendra, S. M. Akbar, L. J. Miranda, J. Santoso, ... **W. Nixon**, ... S. Cahyawijaya. "**SEACrowd: A Multilingual Multimodal Data Hub and Benchmark Suite for Southeast Asian Languages**". In *Proceedings of the Empirical Methods in Natural Language Processing (EMNLP)*, 2024.

RESEARCH EXPERIENCE

Research on Data Stall Mitigation

Mar 2025 – Present

Undergraduate Researcher

Remote

- Collaborated with Prof. Haryadi S. Gunawi (UChicago) and **Argonne National Laboratory** on mitigating I/O bottlenecks that stall deep learning training.
- Evaluated **AIO**, a methodology to pinpoint model I/O bottlenecks, increase effective bandwidth, and lower optimization costs using **GPU-free simulation**.
- Led experiments for optimization of **2 of 4 real-world use cases** involving weather forecast models.

Research on Workload Drift

Sep 2023 – Mar 2025

Undergraduate Researcher

Remote

- Collaborated with Prof. Haryadi S. Gunawi (University of Chicago) to study impact of **workload drift** in systems.
- Reproduced drift-mitigation algorithms (**Matchmaker**, **DriftSurf**, **AUE**), benchmarking them under drifting workloads.
- Integrated and evaluated these algorithms in **GL-Cache** and **LinnOS**, achieving up to **5% lower miss ratio** and cutting **tail latency**.
- Packaged the research pipeline as a reproducible **Chameleon Tovi artifact** to support future research.

SeaCrowd Project

Jul 2023 – Sep 2024

Undergraduate Researcher

Bandung, Indonesia

- Participated in a joint collaboration to collect NLP datasets for **Southeast Asian languages**, which are underrepresented in the research community due to data scarcity.
- Implemented standardized dataloaders for seamless integration with **HuggingFace's platform**, facilitating public dataset use by researchers and developers.
- Reviewed and validated **community-submitted dataloaders** to ensure functionality.

WORK EXPERIENCE

Bandung Institute of Technology

Teaching Assistant

Jan 2023 – Jun 2024

Bandung, Indonesia

- **Probability and Statistics (Spr '24):** Head TA. Led a team in designing and grading class project for **150+ students**.
- **Discrete Mathematics (Fall '23):** Designed and graded quizzes and homework assignments for over **150+ students**.
- **Introduction to Python Programming (Spr '23):** Proctored and mentored class labs consisting of **20+ students**.

TEDx ITB

Backend Developer

Jan 2023 – Apr 2023

Bandung, Indonesia

- Served as the sole backend developer for TEDx ITB, an annual event hosting over **200 participants**.
- Developed the **ticketing system** and implemented backend logic to ensure smooth event operations, contributing to raising **20 million IDR** in revenue.
- **Tech Stack:** Next.js (Node.js & React), Strapi CMS, SendGrid.

Bukit Vista Hospitality Services

Backend Developer

Mar 2022 – Dec 2022

Remote

- Developed a **backend calendar system** for a mobile app to allow property partners to view their properties' occupancy in a Google-calendar-like manner.
- Automated various businesses processes in **finance and HR**, reducing time otherwise consumed by up to **90%**.
- **Tech Stack:** Node.js, Python, AWS, Integromat.

HIGHLIGHTED PROJECTS

Simple OS | C, QEMU |

- Developed a basic **operating system kernel** from scratch, with support for interrupts, keyboard input, and FAT32 file system management.
- Implemented key filesystem operations such as `ls`, `cd`, `mkdir`, `whereis`, `cat`, `rm`, `cp`, and `mv`, providing full CRUD functionality.

3D WebGL Editor | JavaScript, React, WebGL |

- Built a **3D model editor** using WebGL primitives (w/o library) for rendering hollow and articulated models with real-time animation transformations such as translation, rotation, and scaling.
- Implemented interactive features including model save/load functionality, camera control with multiple projection types, and shading with material properties like diffuse, specular, and texture mapping.
- Supported advanced features like dual canvas views, GPU-based picking, tweening, and post-processing effects.

TCP over UDP | Python |

- Implemented **TCP protocol over UDP** (unreliable socket), under unreliable network conditions (packet delay, corruption, duplication, and loss).
- Developed core features including **three-way handshake**, **file transfer**, error-correcting codes (**Hamming**), and proper connection termination.
- Built a **Tic-Tac-Toe game** on top that can run across multiple devices in the same network.

TECHNICAL SKILLS

Programming Languages: C, C++, Go, Java, JavaScript, Python, SQL

Machine Learning: PyTorch, TensorFlow

Systems: Apache Spark, RabbitMQ, Redis, FEMU

Cloud Computing: Google Cloud, AWS, Chameleon Cloud

Mobile Development: Android, React Native

DevOps: GitHub CI/CD, Vercel, Docker

Misc: LaTeX, Make, CUDA, OpenMP

REFERENCES

Haryadi S. Gunawi

Associate Professor

University of Chicago

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Achmad Imam Kistijantoro

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