

Senapati Diwangkara

EDUCATION

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• Johns Hopkins University

Aug '21 - May '27 (expected)

Ph.D., Computer Science (CGPA 3.97/4.00), advised by Prof. Yinzhi Cao

Baltimore, MD, USA

◦ Research area: security and reliability of web infrastructure through cost-efficient agentic architecture and program analysis

◦ Head Teaching Assistant (Fall '22 – Fall '24): Object-Oriented Software Engineering, Software Testing and Debugging, Introduction to Algorithms

• Bandung Institute of Technology

Aug '16 - Jul '20

B.S., Computer Science (CGPA 3.62/4.00), with Cum Laude distinction

Bandung, Indonesia

SELECTED PUBLICATIONS

• TranSPARent: Taint-style Vulnerability Detection in Generic SPAs through Automated Framework Abstraction

NDSS '26

Senapati Diwangkara, Yinzhi Cao

• Deriving Semantic Checkers from Tests to Detect Silent Failures in Production Distributed Systems

OSDI '25

Chang Lou, Dimas Shidqi Parikesit, Yujin Huang, Zhewen Yang, Senapati Diwangkara, Yuzhuo Jing, Achmad Imam Kistijantoro, Ding Yuan, Suman Nath, Peng Huang

• Tempus: Probabilistic Network Latency Verification

IEEE Access '24

Sepehr Abdous, Senapati Diwangkara* (*equal contribution), Soudeh Ghorbani*

• Study of Data Imbalance and Asynchronous Aggregation Algorithm on Federated Learning System

ICITSI '20

Senapati Diwangkara, Achmad Imam Kistijantoro

RESEARCH EXPERIENCE

• Amazon Science - Nova AI Challenge 2026 (Team Jay'IBreak)

Jan '26 - Present

Johns Hopkins University team selected as 1 of 10 invited university teams for the Trusted Software Agents academic competition

Baltimore, MD, USA

◦ Led static analysis sub-team in Team Jay'IBreak, 1 of 10 selected teams competing for \$700,000 prize pool to build cybersecurity agents for Python and JavaScript

◦ Ranked 1st and 2nd in the first two tournaments by architecting and building a fleet of taint-flow-guided detection agents using Claude Agent SDK, Effect.ts, and Docker

◦ Cut API costs by 50% with self-hosted SGLang inference on a Terraform-managed GPU fleet serving 200+ agents, benchmarked for throughput using GuideLLM

• Johns Hopkins University - Automated Vulnerability Detection in Single Page Applications (SPA)

Jul '24 - Dec '25

Advised by Prof. Yinzhi Cao

Baltimore, MD, USA

◦ Invented TranSPARent, a TypeScript and CodeQL pipeline using test traces and static taint analysis to automatically uncover 19 sinks across Vue, React, and Angular

◦ Detected 14 missing framework sinks from CodeQL and cut false-negative rate on 56 public CVE/GHSA vulnerabilities from 62.5% to 19.6% versus vanilla CodeQL

◦ Discovered and responsibly disclosed 11 zero-day vulnerabilities across 877 GitHub repos involving SPA frameworks, including a 24k-star, 30M-request/month project

• Microsoft Research - Automated Detection of Silent Semantic Failures in Distributed Systems

Jan '23 - Jun '24

Advised by Dr. Suman Nath, alongside Prof. Chang Lou (UVA), Prof. Ding Yuan (Toronto), and Prof. Peng Huang (Michigan)

Baltimore, MD, USA

◦ Co-developed T2C, an 8,000-SLOC Java pipeline using static and dynamic analysis to convert unit tests into production runtime checkers for detecting silent failures

◦ Generated 672 verified checkers across ZooKeeper, Cassandra, HDFS, and HBase, which improved detection recall rate to 75% versus 40% in state-of-the-art baseline

◦ Discovered a P1 bug in ZooKeeper 3.9.2 with network-fault injection where mismatched snapshot/log transaction IDs blocked replay and corrupted replicated state

• Johns Hopkins University - Verification of Network Latency SLA in Faulty Datacenter Networks

Aug '21 - Dec '22

Advised by Prof. Soudeh Ghorbani (affiliated with Meta)

Baltimore, MD, USA

◦ Co-built Tempus, a network latency verification pipeline, which could verify 99th-percentile packet latency across 10–70% load in faulty datacenter and WAN networks

◦ Scaled a previously impractical latency verification task by 935,179× versus state-of-the-art packet-level verifier, DONS, on a 16-ary fat-tree network at 25% load

◦ Designed a dynamic programming mechanism for overlapping paths that cut verification time by 316× and lowered memory use by 21% on an 8-ary fat-tree network

PROFESSIONAL EXPERIENCE

• Shopee - Backend Engineer Internship

Nov '20 - Feb '21

NYSE:SE - The largest e-commerce platform in Southeast Asia

Jakarta, Indonesia

◦ Migrated 16 divergent Go minigame backends to a uniform API specification and integrated operational and product telemetry into production Grafana dashboards

◦ Designed 3 new Grafana dashboards that computed and visualized user retention and resource utilization metrics from production telemetry across all in-app minigames

◦ Created 2 GitLab CI pipelines to regression-test Go backend and Grafana dashboard integrations across all minigames before every production backend deployment

• GoTo - Data Scientist Internship

Dec '19 - Feb '20

IDX:GOTO - The largest ride-hailing company in Indonesia, operating across Southeast Asia

Jakarta, Indonesia

◦ Initiated Simulacrum, a data-driven ride-hailing market simulator processing 1,000+ orders/second to evaluate the revenue of a proposed driver-incentive scheme

◦ Architected a preprocessing pipeline for 5M+ rows of ride-hailing orders stored in BigQuery to train a driver-incentive scheme market demand model using scikit-learn

◦ Delivered a 9-page Pydoc-based handoff documentation and presented simulation findings and business implications to stakeholders, including the VP of Data Science

AWARDS AND ACTIVITIES

• \$1,337 Vulnerability Bounty for Gemini CLI GitHub Action Prompt Injection and Secret Exfiltration, Google ([The Register](#))

2026

• Selected for the CS Research Mentorship Program (CSRMP), Class B, Google research-mentorship and peer-networking cohort ([official list](#))

2022

SKILLS

• **Programming Languages:** TypeScript/JavaScript, Effect.ts, Python, Go, Java, Rust, SQL, Nix

• **Agents and Machine Learning:** Claude Agent SDK, Pi Coding Agent SDK, Temporal, LiteLLM, SGLang, vLLM, PyTorch, TensorFlow

• **Security and Program Analysis:** CodeQL, Semgrep, Esprima, abstract interpretation, model checking, fuzzing, Java Management Extensions (JMX)

• **Infrastructure and Distributed Systems:** Linux, AWS (EC2, S3, Lambda), Terraform, Docker, Cassandra, ZooKeeper, HDFS, Grafana, GitLab CI