Raziq R. Ramli

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EDUCATION

Purdue University West Lafayette, IN

BSc Computer Science Honors, Minor in Mathematics (CGPA: 3.68) *Aug 2018 – May 2022*

- **Concentrations**: Systems Software, Software Engineering, Machine Intelligence
- **Scholarship**: PETRONAS Education Sponsorhip Program ($180,000)
- **Relevant Coursework**: Parallel Computing, Operating Systems, Compilers, Computer Networks, Relational Database, Software Engineering, Software Testing, Cryptography, Artificial Intelligence, Data Mining & Machine Learning, Numerical Linear Algebra, Algorithms Analysis, Theory of Computation, Virtual Reality Technology

EXPERIENCE

Reliable and Secure Systems Lab Purdue University

Undergraduate Researcher | *C++, SVF, LLVM* *Jan 2022 – Present*

- Designed a pointer analysis platform based on SVF and LLVM
- Enabled concurrent software analysis by parallelizing Andersen's Wave Propagation algorithm
- Constructed a testing pipeline to validate the parallel algorithm's correctness
- Investigated optimization techniques that exploit architectural properties of modular systems

Rosen Center For Advanced Computing Purdue University

Software Intern | *Python, Github Action, Selenium, Figma, Pandas, Ipywidgets* *May 2021 – Aug 2021*

- Designed an open-source data processing pipeline for AgMIP Global Economics researchers
- Resolved 10MB file upload limit of MyGeoHub applications by repurposing Jupyter kernel's API
- Implemented a DDD-oriented architecture to accommodate diverse data formatting requirements
- Engineered data diagnosis, visualization, and monitoring functionalities by using pandas and matplotlib

Software Intern | *Python, GDAL, SQLite, Ipyleaflet, Ipymaterialui* *May 2020 – Aug 2020*

- Built a geospatial analysis software that supports research on sustainability issues in the US
- Developed algorithms for processing and visualizing agricultural data by using GDAL and Ipyleaflet

Environmental & Ecological Engineering Department Purdue University

Volunteer *May 2020 – Aug 2020*

- Conducted regular consultations to onboard a new developer into the team

Software Developer | *Python, Pandas, Tkinter, Pygubu* *Jul 2019 – May 2020*

- Developed proprietary techno-economic analysis (TEA) software for Critical Materials Institute
- Overhauled legacy prototype within the first 2 weeks of development, enhancing usability and maintainability
- Constructed features for processing scientific modeling and financial reports by using Python

PROJECTS

USC Compiler | *C++, LLVM* *2021*

- Built a compiler for the University Simple C (USC) language by utilizing LLVM
- Created classical optimization techniques including dead block removal and loop invariant code motion
- Constructed Chaitin's graph coloring algorithm for efficient register allocations

Zero-Knowledge Comparator | *Python, Socket, PyNacl* *2021*

- Engineered a secure file comparator by using Socialist Millionaire Protocol and Ed25519 digital signature system
- Proved security guarantees using formal method and received endorsements by 2/2 attacking red teams

PurdueParty.io | *ReactJS, Typescript, Redux, Firebase, CSS, Material UI* *2021*
- Built a web app offering features relating to forums, events, and facilities at Purdue
- Designed Reddit-like forum that supports hierarchical conversations; utilized a flat NoSQL data structure that requires one network request per forum construction
- Delivered 10 user stories within 3 sprints while collaborating in an agile software development cycle

Reliable Data Transfer | *C* *2021*
- Implemented RDT 3.0, Go-Back-N, and Selective Repeat protocols in the transport layer of a simulated network environment
- Programmed a delta list to handle packet timeouts efficiently with a single clock interrupt

XINU OS | *C, x86 Assembly* *2020*
- Developed kernel-level features for the XINU operating system
- Created malicious routine that can access the kernel mode using return-oriented programming
- Engineered fundamental OS features such as context switching, scheduling, and asynchronous event handling

TECHNICAL SKILLS

Languages: C++, C, Python, Typescript, Java, SQL, HTML/CSS, Julia, C#
Frameworks: LLVM, MPI, SVF, ReactJS, Flask, Pytest, Selenium, JUnit
Technologies: GDB, Valgrind, Linux, GitHub Action, Firebase, Postman, Wireshark, Docker

ACTIVITIES

Summer Undergraduate Research Symposium 2021
- Delivered a research talk on AgMIP GlobalEcon Data Submission, an ETL pipeline for a global team of climate researchers

Summer Undergraduate Research Symposium 2020
- Conducted a poster presentation on SIMPLE-G US, an analysis software for studying long-run sustainability issues

Tracer FIRE 2019
- Awarded 1st place (out of 7 teams) in the Forensic & Incident Response Exercise by Sandia National Laboratories

AITP's Computing Challenge Day 2019
- Achieved 3rd place (out of 20 participants) in the competitive programming event hosted by Purdue AITP

ACM ICPC: Malaysia National al-Khawarizmi Programming Contest 2018
- Obtained 12th place (out of 43 teams) in the national ACM ICPC hosted in IIUM, Malaysia