

Raziq R. Ramli

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EDUCATION

Purdue University

BSc Computer Science Honors, Minor in Mathematics (CGPA: 3.72)

West Lafayette, IN

Aug 2018 – May 2022

- **Concentrations:** Systems Software, Software Engineering, Machine Intelligence
- **Scholarship:** PETRONAS Education Sponsorship 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

Undergraduate Researcher | C++, SVF, LLVM

Purdue University

Jan 2022 – Present

- Mandated to build a scalable pointer analysis platform using SVF and LLVM
- Enabled concurrent analysis of distinct software modules by parallelizing a pointer analysis algorithm in SVF
- Developing a process for constructing a software's whole-program analysis from its module-specific analyses
- Engineering an optimization technique that exploits the architectural properties of modular software systems

Rosen Center For Advanced Computing

Software Intern | Python, Github Action, Selenium, Figma, Pandas, Ipywidgets

Purdue University

May 2021 – Aug 2021

- Designed a pipeline that automates data warehouse construction for AgMIP Global Economics researchers
- Resolved 10MB file upload limit of MyGeoHub applications by repurposing Jupyter kernel's API
- Accommodated diverse data formatting requirements by implementing a DDD-oriented layered architecture
- 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

Volunteer

Purdue University

May 2020 – Aug 2020

- Conducted regular consultations to onboard a new software developer into the team
- Established a peer-review process to facilitate knowledge-transfer

Software Developer | Python, 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 reporting preliminary TEA, dynamic TEA, mass flow estimate, and energy cost estimate

PROJECTS

Parallel Hierarchical Clustering | C++, Galois System

2022

- Applying a speculative parallelization technique on agglomerative hierarchical clustering, a graph-based algorithm whose dependences between computation are functions of run time data

USC Compiler | C++, LLVM

2021

- Built a compiler for the University Simple C (USC) language by utilizing LLVM
- Implemented common compiler functionalities from syntactic analysis to IR generation
- Created classical optimization techniques such as constant branch folding, 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
- Formally proved security guarantees 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 pertaining to forums, events, and facilities at Purdue
- Designed Reddit-like forum that supports hierarchical conversations; utilized a flat NoSQL data structure that requires a single network request per forum construction
- Delivered 10 user stories within 3 sprints while collaborating in an agile software development cycle

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 common kernel features such as context switching, scheduling, and asynchronous event handling

Reliable Data Transfer | *C*

2020

- 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 service packet timeouts efficiently using a single clock interrupt

TECHNICAL SKILLS**Languages:** C++, C, Python, Java, Typescript, Javascript, SQL, HTML/CSS, Julia, C, Arduino**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 virtual research talk on AgMIP Global Economics Data Upload Tool, an ETL pipeline for streamlining the ensemble modeling activities conducted by a global team of researchers

Summer Undergraduate Research Symposium

2020

- Conducted a virtual poster presentation on SIMPLE-G US, a geospatial analysis tool for studying long run sustainability issues in the food-water-environment nexus in the US

Tracer FIRE

2019

- Awarded 1st place (out of 7 participating 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 participating teams) in the national ACM ICPC hosted in IIUM, Malaysia