

# Fuad Ismail

+62-838-9937-3595 | fuad1502@gmail.com | github.com/fuad1502

## SUMMARY

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I have 2 years of experience as a software engineer and 4 years of R&D experience in the hardware industry. Currently, I am a software engineer at Samsung, maintaining & developing systems software running on Tizen OS and independently working on optimizing the .NET runtime Just-In-Time compiler for RISC-V architecture.

I have contributed to various C++ & Rust open source projects: .NET runtime, Verilator, utils/coreutils, and utils/util-linux. I am also currently working on my own open source project, Oombak, an interactive SystemVerilog simulator UI that runs on the terminal.

I am a self motivated person, frequently showed initiative at the workplace. I am also a passionate learner, currently interested in compilers, operating systems, computer graphics, and embedded systems.

## EDUCATION

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### **Bandung Institute of Technology**

*Electrical Engineering (BSc), ABET Accredited, GPA 3.81/4.0*

Bandung, Indonesia

2014 - 2018

## OPEN SOURCE CONTRIBUTIONS

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**.NET runtime** : #112978, #113250, #113676, #113999, #114470, #114488, #114728, #117408

**Verilator** : #4966, #5006

**utils/coreutils** : #6951

**utils/util-linux** : #152, #160, #167

## EXPERIENCES IN S/W INDUSTRY

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### **Samsung**

*Software Engineer (TV S/W Platform)*

June 2024 - Present

Jakarta, Indonesia

- Demonstrated initiative by independently introducing multiple optimizations to upstream .NET runtime RISC-V Just-In-Time Compiler which improved multiple micro-benchmarks performance scores on Samsung's RISC-V TV chipset by up to 70%.
- Resolve various issues and implement new features for Tizen OS's App Framework & .NET Framework systems software (e.g. installer & application launcher) written in C++.
- Involved in the development of a new Tizen OS daemon written in C++.
- Lead the development of an in-house Tizen .NET application written in C#.
- Initiated the porting of a systems component to Rust.
- Received an employee of the quarter award.

### **Lumina Industries**

*Software Engineer*

February 2021 - October 2021

Jakarta, Indonesia

- Wrote the Windows middleware for a Virtual Camera software using Win32 API.
- Developed image processing features using C++ with OpenCV.
- Worked remotely with a medium-sized team from various nationalities (USA, Taiwan, and Indonesia).

## EXPERIENCES IN H/W INDUSTRY

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### **Keysight Technologies**

*R&D Hardware Engineer*

January 2022 – August 2023

Penang, Malaysia

- Initiated the development of NAALG, a network analyzer algorithms C++ library.
- Significantly improve the measurement accuracy of an embedded VNA product by introducing and implementing a better calibration algorithm.
- Successfully extend the measurement bandwidth of an embedded VNA product.
- Fixed a technical issue in an embedded VNA product and wrote a technical paper on it.
- Collaborate in a team from various time zones (USA, Europe, and Malaysia).

### **Hariff Daya Tunggal Engineering**

*R&D Radio Frequency Engineer*

August 2020 – February 2021

Bandung, Indonesia

- Wrote MATLAB simulations to evaluate system-level design tradeoffs for the development of a fully custom telecommunication device.
- Implemented the PHY and MAC layer of a fully custom telecommunication device on an APSoC using Verilog and C.
- Designed a schematic for a fully custom telecommunication device.

## Labs247 (SOLUSI247)

August 2018 – August 2020

*R&D Electronic Design Engineer*

*Jakarta, Indonesia*

- Lead the development of telecommunication product (AIS SART) which is still in production up till now.
- Involved in the development of medical product (CPAP BiPAP machine).
- Demonstrated initiative by suggesting cost-saving solutions that avoids vendor lock in and introduced an efficient production workflow.

## OPEN SOURCE PROJECTS

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### Oombak

November 2024 – Present

[github.com/fuad1502/bilbob](https://github.com/fuad1502/bilbob)

Oombak (/ˈoʊmbək/, "waves" in Indonesian) is an interactive SystemVerilog simulator UI that runs on your terminal! Oombak is written in Rust & C++ and uses Ratatui, Verilator, and slang libraries, among others.

### Rubbler

November 2023 – March 2024

[github.com/fuad1502/rubbler](https://github.com/fuad1502/rubbler)

Rubbler is a RISC-V assembler written in Rust. This library was written with the main purpose of embedding a simple RISC-V assembler inside of a RISC-V CPU test bench code written with Verilator.

### RVSV

November 2023 – March 2024

[github.com/fuad1502/rvsv](https://github.com/fuad1502/rvsv)

RVSV is a SystemVerilog implementation of a 5-stage pipelined RISC-V CPU. Verification code is written in C++ using Verilator and Rubbler.

### Open Running Watch

April 2024 – May 2024

[github.com/fuad1502/open-running-watch-hw](https://github.com/fuad1502/open-running-watch-hw)

An open source GPS running watch schematic & PCB design.

## OTHER PROJECTS

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### NAALG: Network Analyzer Algorithms C++ Library

*Keysight Technologies*

I initiated the development of NAALG due two things. First, I was tasked with developing a novel Time Domain Reflectometry (TDR) calculation from Vector Network Analyzer (VNA) measurements. Second, on a different project, I had just implemented a new calibration algorithm for an embedded VNA. Since both of this project involves calculation on VNA measurements, I realize that it would be nice to have a library that provides all of these VNA algorithms in one place. NAALG is similar to scikit-rf, but uses high performant implementation in C++ to enable usage in embedded real-time measurement applications.

### Custom Telecommunication Device (GMSK + TDM Transceiver)

*Hariff Daya Tunggal Engineering*

My team was tasked with developing a fully custom telecommunication device. My role was in developing the physical (PHY) and medium access control (MAC) layer on an *All Programmable SoC (APSoC)*. The PHY layer is written in Verilog, while the MAC layer is written in C. Communication between the two layers uses Direct Memory Access (DMA).

### Automatic Identification System Search and Rescue Transponder

*Labs247*

Automatic Identification System (AIS) Search and Rescue Transponder (SART) is a radio device used to locate distressed vessels. My role was in developing all of the electronic and embedded software aspect of the device, and production. We use FreeRTOS Real-Time Operating System to enable low power usage and multiple tasks management. Up till now the device is still in production.

## TECHNICAL SKILLS

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**Programming Languages:** Modern C++, C, Rust, RISC-V Assembly, Go, JavaScript, Python, Bash, SQL, SystemVerilog, MATLAB

**Developer Tools:** CMake, Make, RPM, GDB, Git, Docker/Podman, GBS

**Libraries / Frameworks:** POSIX, GLib, OpenGL, React, Ratatui, FreeRTOS, Tizen NUI

**Knowledge Domains:** Compilers/Runtimes, Operating Systems, GNU/Linux, Embedded Systems, Digital/Analog/RF electronics, Schematic & PCB Design