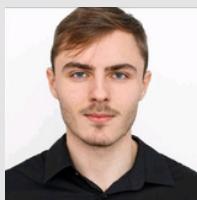


# Vanca Rafael-Marian

## Embedded Software Engineer



### CONTACT

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- vanca.rafael.marian@gmail.com
- [LinkedIn Page](#)
- [Github Page](#)
- [My personal Page](#)

### SKILLS

- Simulink
- Matlab
- Jira
- Polarion
- Git Github Jenkins
- Electronics
- Vivado Signal Processing
- Flutter FireBase
- Machine Learning
- C C++
- Python
- Electrification
- Invertors
- EV's
- Agile
- Kanbas
- React

### LANGUAGES

- English (Fluent)
- Romanian (Fluent)

### DRIVING LICENSE

- B

### PROFILE

Innovative Software Engineer focused on Advanced R&D within the automotive sector. Skilled in Matlab, Simulink, and Hardware Integration, with a strong commitment to delivering high-quality code in Agile environments. Take a look at my personal page: <https://vancarafaelmariannetlifyapp>

### WORK EXPERIENCE

**Schaeffler ( former Vitesco)** 03.2024 - PRESENT

Embedded Software Engineer - Advance Innovation Team

- Developed safety-critical control logic for Inverters using Matlab/Simulink, focusing on signal scaling, HDL synthesis, and code validation.
- Managed version control and automation using Git/GitHub, Jenkins, and GitHub Actions to streamline CI/CD pipelines.
- Validated software performance on hardware targets (SpeedGoat, MicroAutoBox 2&3) using CANalyzer and oscilloscopes for rigorous signal analysis.
- Produced comprehensive technical documentation and collaborated in an Agile team to transition innovation projects from concept to Business Unit integration.

**Diligent** 03.2023 - 06.2023

Student

- Diligent VHDL club working with FPGA and System-on-Chip based on ARM processor.
- Working with Vitis SDK to develop different project using C Embedded for Zybo Z7 and Basys 3 development boards.
- Develop and implement different tasks on Basys 3 and Zybo Z7 boards using Vivado with VHDL.
- Using Linux and PetaLinux to implement projects on Zybo Z7 development board.

**SC PROELECTRO SRL** 06.2022 - 08.2022

Technology Assistant

- Study and implementation of alarm systems
- Study and implementation of video surveillance systems

### EDUCATION

**Master of Circuits and Integrated Systems** 2023 - 2025

School of Electronics | Technical University of Cluj Napoca

Final grade: 10.0 / 10.0

**Bachelor of Electronic Telecommunication and Information Technology** 2019 - 2023

Applied Electronics | Technical University of Cluj Napoca

Final grade: 9.4 / 10.0

### PERSONAL PROJECTS

**AI-Optimized Field Oriented Control (FOC) System**

[Link to project](#)

- Designed a 3-phase grid-connected power system, integrating an AC/DC rectifier, DC-DC Boost converter, and battery storage simulation.
- Implemented Field Oriented Control (FOC) for a 3-Level inverter, utilizing Reinforcement Learning (RL) to optimize current control loops and system efficiency.
- Established CI/CD pipelines using GitHub Actions to automate testing and ensure continuous integration.

## FPGA Sound Equalizer & Visualizer

[Link to project](#)

- Developed a real-time sound equalizer on the Zybo Z7 FPGA, utilizing Vivado (VHDL) for hardware definition and Vitis (Embedded C) for application logic.
- Implemented I2C communication with the SSM2603 Audio Codec and designed a Finite State Machine (FSM) to manage audio recording, processing, and playback.
- Integrated VGA output for a graphical sound bar display and maintained version control via Git/GitHub.

## Flutter Fitness App with AI & Gamification

[Link to project](#)

- Developed a cross-platform (Mobile & Web) application using Flutter, replacing traditional logs with real-time syncing and graphical progress tracking.
- Integrated an AI-driven coaching system to generate personalized 3-month training cycles, combined with RPG-style gamification to boost user engagement.
- Implemented advanced analytics (1RM calculation, volume history) using Provider for efficient state management and Netlify for automated deployment.

## PCB Design Projects

[Link to project](#)

- Designed multi-layer PCB layouts using OrCAD Capture CIS, managing stack-up and component routing.
- Performed electrical validation and circuit testing to ensure design integrity.

## 8051 Environmental Monitoring System

[Link to project](#)

- Developed an embedded system using the 8051 microcontroller, interfacing analog/digital sensors via ADC and I2C protocols to display data on an LCD.
- Implemented low-level firmware in Assembly using Keil uVision 5 and validated the circuit design through Proteus simulation

## Liquid Level Control System

[Link to project](#)

- Designed an analog monitoring circuit in Orcad, utilizing a potentiometer-based sensing mechanism and LED indicators.
- Conducted rigorous circuit stability analysis using DC-Sweep, Transient, Monte Carlo, and Worst-Case simulations to validate performance under varying conditions.

## Class-B Power Amplifier Simulation

[Link to project](#)

- Developed a MATLAB model to simulate the behavior of a Class-B amplifier and analyze signal response across various input waveforms.
- Evaluated power consumption and efficiency metrics under different operating conditions to validate the amplifier's performance.

## Image Processing – Laplacian & Gaussian

[Link to project](#)

- Implemented Laplacian edge detection algorithms in Python, automating the generation of convolution masks for various dimensions.
- Optimized algorithm performance for high-speed processing and real-time contouring applications suitable for practical deployment.