

# VANCA RAFAEL MARIAN

EMBEDDED SOFTWARE ENGINEER - ADVANCE INNOVATION



## CONTACT

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<https://github.com/RafaelMarian>

## SKILLS

- Matlab/Simulink
- C/C++
- Vivado/Xilinx/VHDL/  
FPGA
- Embedded SW/Signal  
processing
- CI/CD Git/Github/Actions/  
Jenkins
- Jira/Confluence/Agile
- Python/ML/RF/AI
- PCB/Electronics/EV

## LANGUAGES

- English (Fluent)
- Romanian (Fluent)
- German (Basic)



## PROFILE

Embedded Software Engineer, in the Advance Innovation Team, working to develop products that will Innovate the Automotive Industry. Working on new projects all the time with the new technologies.



## WORK EXPERIENCE

### Schaeffler

03.2024 - PRESENT

Embedded Software Engineer - Advance Innovation Engineer

- Develop and execute different software tasks using Matlab, Simulink, Jenkins, Github, Github Actions, AWS Amazon.
- Implementing Test Harnesses, HDL Synthesis, control logic, signal scaling, CI/CD pipelines, safety logic, FPGA implementation.
- Working with a dynamical team, with Hardware, System, Mechanics, Software Engineers, PM and Scrum Master on Agile methods, having multiple Business trip to Germany for testing the software on SpeedGoat, MicroAutoBox 3 and Oscilloscope, also working with Jira and Polarion to log the tasks. Having Lean and Kanbas trainings. Working on three different projects with three different teams, we are creating Physical product that are brights ideas and then will be passed to the Business Unit were the final product will be created and sold on the market to the biggest automotive companies.

### Diligent

03.2023 - 06.2023

Student

- Digilent 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** School of Electronics | Technical University of Cluj Napoca  
**Final grade:** 10.0 / 10.0

2023 - 2025

**Bachelor of Electronic telecommunication and information technology**

2019 - 2023

School of Electronics - Applied Electronics |  
Technical University of Cluj Napoca  
**Final grade:** 9.4 / 10.0

## PERSONAL PROJECTS

<https://github.com/RafaelMarian/DisertatieRaf>

### Field Oriented Control using Machine Learning for optimize control of Electric Motors

- System that takes the energy from the power grid, we selected the three-phase system, to simulate the real time application, then to convert the AC into DC signal, using a rectifier.
- DC-DC Boost to be able to achieve that value and to be able to store this value into the battery system. From these we went into the Current control system to be able to control the 3L inverter.
- Use ML and AI to improve some of the parts of the control look for the current and to improve the DC-DC system functionality.
- Field Oriented Control for the control Logic.
- Reinforcement Learning for the optimize of the Control System.
- GitHub Actions for the Continuous Integration and Continues Development.

Link <https://github.com/RafaelMarian/SoundEqualizer>

### Sound Equalizer using FPGA - Embedded Systems

- Utilized Zybo Z7 development board and Vivado/VHDL to implement a sound equalizer. The project's logic was implemented in embedded C through the utilization of the Vitis development tool, primarily built on Eclipse.
- The core logic involves coding for communication with various I2C peripherals, alongside the development of a standalone application functioning as a state machine. Integrated SSM2603 video core for audio recording and playback.
- Developed state machine using Vitis SDK to interact with the user and perform various sound manipulation tasks. Connected Zybo board to VGA for graphical representation of sound bar.
- Managed project using Git and GitHub for version control.

Link <https://github.com/RafaelMarian/SoundEqualizer>

### PSB Design

- Utilized OrCad Capture CIS and Layout extension for designing and creating PCB layouts.
- Created multi-layer designs, including top layer, through-hole components layer, and ground layers.
- Routed components and performed electrical testing for validation.
- Successfully completed circuit design for various projects.

Link <https://github.com/RafaelMarian/PCB-Design>

### A more green life! - Circuit made with 8051 micro controllers.

- Developed a circuit to create a better environment for plants and trees.
- Measured environmental data using analog and digital sensors.
- Used ADC and I2C protocols for data conversion and communication.
- Displayed collected data on an LCD.
- Implemented the project using Assembly, Keil uVision 5, and Proteus.

Link <https://github.com/RafaelMarian/8051-microcontrollers>.

### Liquid Level control system

- Designed a circuit using Orcad to simulate different levels of water.
- Incorporated a potentiometer and LED indicators for measurement and visualization.
- Performed validation and analysis using various techniques such as DC-Sweep, Temperatures, Worst-Case, Monte Carlo, and Transient simulations.

Link <https://github.com/RafaelMarian/Liquid-level-control-system>

### Class B Amplifier

- The project involved creating a MATLAB model to simulate the behavior of the Class-B amplifier.
- Various input waveforms were applied to the amplifier circuit, and their corresponding output characteristics were observed and recorded.
- The project included the measurement and analysis of power consumption and overall amplifier efficiency under different operating conditions.

Link <https://github.com/RafaelMarian/Class-B-Amplifier>

## Image filtering using Laplace

- The theme of our project involves the application of Laplace Operators in edge detection/contouring (automatic generation of convolution masks of various dimensions) using Python and Google Colab.
- The Laplace operator is a second-order differential operator in an n-dimensional Euclidean space. Due to its high processing speed, the chosen theme optimally aligns with practical use.

Link <https://github.com/RafaelMarian/ImageProcessing-Laplacian.Gaussian>

## Flutter Fitness App for Android

- Creating a fully functional app using Flutter.
- Simple Fitness app that tracks all multiple sports.
- Using FireBase

Link <https://github.com/RafaelMarian/ImageProcessing-Laplacian.Gaussian>

## Product purchase AI model using Python Docker CI/CD React Flash Render

- Developed a full-stack web application using Flash for the backend and React for the frontend.
- Integrated with predictive AI model to forecast product purchase. Implemented REST API endpoints, environment variable management and CORS support. Deploying using Render with a fully automated CI/CD pipeline on Github Actions, including Python and Node.js dependency management, frontend build and Docker container validation

Link <https://github.com/RafaelMarian/ai-insights>