

Alessandro Renzi

Curriculum Vitae

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Info

Born	January 7th, 1990 in Rimini (Italy)	Citizenship	Italian
Driver's License	Italian A and B	LinkedIn	https://www.linkedin.com/in/alessandro-renzi-84b91a26/
Website	www.nullptr.it		

Desidered Employment and Current Skills

Hardware Engineer - Digital Electronics

I have always been interested in both hardware and software and I study them since the third year of high school, going beyond the lessons by my own as much as possible. I'm looking for a job in architectural and RTL design possibly covering also software integration. I'm very good at mixing knowledge from different areas and always willing to learn new things, especially from people more experienced than me. I'm able to work without supervision but also as part of a team.

Technical skills

Programming Languages	C/C++, Verilog, SystemVerilog, VHDL, SystemC, PIC Assembly, 8086 Assembly, C#, Java, Bash, Python, TCL, Makefile, Latex
Operating Systems	Unix, Linux, Gentoo, Debian, Windows
CAD Tools	Synopsys DesignCompiler, Synopsys DesignVision, Synopsys Primetime, Synopsys Tetramax, ModelSim, QuestaSim, Cadence JasperGold, Cadence Encounter, Cadence CtoS, Xilinx EDK, Multisim, Ultiboard, Eagle, AWR Microwave Office
Libraries & IDEs	OpenCV, OpenMP, Qt, Matlab, Simulink, Mathematica, LabView, Xilinx ISE, Altera QuartusII, MPLAB, CodeWarrior, mbed.org, TexMaker, Eclipse, KDevelop, QtCreator, VisualParadigm
Hardware Platforms	PIC16F, PIC18F, PIC24F, Xilinx ZYNQ 7000, Zedboard, Altera Cyclon II, Wiznet W5100 and W5200, WIZ820io, FRDM-KL25Z, MSP430 LaunchPad, RaspberryPi
Other	UML, Git, CMake, Doxygen, OpenSSH, iptables, lighttpd, vsftpd, tmux, vim

Languages

Italian	Native
English	IELTS 7 (CEFR C1 equivalent)

Education

- 2012 - 2015 **Master Degree in Electronic Engineering**, *Polytechnic University of Turin*, Turin, Italy.
Specialization in Embedded Systems, **Grade:** 110/110, **GPA:** 3.67
Courses:
- **Codesign Methods and Tools:** Design a complex HW/SW system and model functions, parameters and data as methods and attributes of UML classes.
 - **Computer Architectures:** Assembly programming techniques, pipeline processors, instruction level parallelism, compiler techniques, static and dynamic branch prediction, out of order execution, hardware based speculation, ARM architecture and AMBA bus fundamentals.
 - **Electronic Systems Engineering:** Advanced PCB design, EMI.
 - **Electronics for Embedded Systems:** Embedded systems, operational amplifiers, ADC and DAC, power electronics, memories, programmable logics, communication bus, CPU peripherals.
 - **Guiding electromagnetic systems:** Microwave filters, circulators, power dividers, directional couplers, mixers, electromagnetic compatibility.
 - **Integrated systems architecture:** Pipelining, retiming, folding, unfolding, algorithm transformation for ASIC implementation, architecture exploration, VLIW architectures, instruction level parallelism, arithmetic circuits, on-chip interconnections, network-on-chip.
 - **Microelectronic systems:** High level architectures case studies (Pentium4, Niagara T2, ARM), CPU's functional blocks (adders, multipliers, dividers, ALUs, Register files, etc.), VHDL implementation and synthesis laboratories (ST's 90 nm), logic families, physical design, post-layout verification.
 - **Model-based software design:** Model-based software design workflow, automotive case-study, ISO26262 standard, AUTOSAR, Misra C, Simulink algorithm modeling, automatic code generation, code integration on ARM platform.
 - **Modeling and optimizations of embedded systems:** System level and RTL level modeling in SystemC, EFSM composition, control dominated system modeling in ECL (C Esterel), hardware and software synthesis of Esterel code and OS interfacing, formal verification, scheduling of dataflow network, Kahn process network and boolean dataflow network, dataflow network hardware synthesis, WCET (worst case execution time) analysis of software.
 - **Operating systems:** OS classification, kernel, process, process synchronization, process communication, threads, embedded OS, development tool chain, system programming through POSIX APIs.
 - **Synthesis and optimization of digital systems:** Digital synthesis workflow, TCL scripting for synopsys design compiler automation, architectural synthesis, scheduling, resource and register sharing, two level synthesis, multilevel synthesis, low power design.
 - **Testing:** Testing and reliability, design for testability, fault simulation, test pattern generation, ATPG, scan chain design, memory test pattern, BIST, fault tolerant systems.
 - **Testing and certification:** Measurement instrument certification, instrumentation's metrological confirmation, DAQ boards, digital oscilloscope, logic state analyzer, sensors, conditioning circuits, distributed measurement systems, interconnection bus, reliability analysis, fault classification, fault models.
- 2009-2012 **First Level Degree (Bachelor) in Electronics, Informatics and Telecommunications Engineering**, *Seconda facoltà di ingegneria con sede a Cesena - University of Bologna*, Cesena, Italy.
Thesis title: Implementation of low latency UDP communication through Ethernet module for FPGA and prototype PCB design.
PDF link
- 2004-2009 **Electronic and Telecommunications Technician**, *I.T.I.S. Leonardo da Vinci*, Rimini, Italy.
Italian high school diploma

Personal and Academic Projects

- September 2014 **Collision Avoidance.**
Documentation link, GitHub link
- June 2014 **Multithreaded Blowfish Algorithm Implementation.**
Documentation link, GitHub link
- May 2014 **Porting of nRF24L01P driver to PIC18F.**
Driver of nRF24L01P chip for PIC18F (XC8 compiler) ported from mbed.org
GitHub link
- April 2014 **IoT - PicHomeAutomation.**
Four relays and a temperature sensor remotely controlled.
Documentation link, Youtube link, GitHub link
- March 2014 **Profiling OpenCV 3 using gprof.**
Documentation link
- February 2014 **Design of a 4-state ACS with SystemC.**
An ACS is one of the basic blocks of the Viterbi Algorithm.
- ACS implementation
- SystemC simulation
- Modelsim SystemC simulation
- Modelsim mixed SystemC-Verilog simulation using a given implementation of the ACS and comparison
Documentation link
- February 2014 **ASIP design based on Transport Triggered Architecture using TCE.**
Documentation link
- February 2014 **FIR ASIC Implementation.**
From Matlab to ASIC implementation and simulation.
- FIR coefficient synthesis with matlab and spectral analysis
- VHDL implementation
- Testbench implementation
- Simulation with Modelsim
- Logic synthesis with Synopsys Design Compiler
- Switching activity-based power consumption estimation
- ASIC Place&Route
- Post Place&Route simulation and switching activity-based power consumption estimation
Documentation link
- January 2014 **Temperature Acquisition System.**
Hardware and software design for a temperature acquisition system.
- November 2013 **Stepped impedance RF low-pass filter.**
Documentation link
- October 2013 **LeapHID.**
Software written in C++ that convert Leap Motion gestures into mouse and keyboard events.
GitHub link
- July 2013 **Pipelined DLX Implementation.**
Pipelined implementation of a subset of the DLX instruction set.
Documentation link, GitHub link
- June 2013 **DualVth TCL function for Synopsys PrimeTime.**
Script to apply in a smart way the Dual-Vth low power technique on Synopsys PrimeTime.
GitHub link
- January 2013 **Parallelization of an MJPEG encoder using OpenMP.**
- GProf profiling
- Parallelization using OpenMP
- Achieved speedup: 2.34 times

January 2013 **Software UART implementation for Nios2 CPU.**
GitHub link

Working Experience

- Aug 2017 - **Hardware Design Engineer**, *Arm*, Cambridge, UK.
Present System integration - Security Architecture
- Apr 2017 - **Hardware Design Engineer**, *Arm*, Cambridge, UK.
Aug 2017 System integration - Security: responsible for integration of the Root of Trust and cryptographic accelerator in systems for different target markets
- Sep 2016 - **Graduate Hardware Design Engineer**, *Arm*, Cambridge, UK.
Apr 2017 System integration - Security: responsible for integration of the Root of Trust and cryptographic accelerator in systems for different target markets
- Sep 2015 - Sep **Graduate Hardware Design Engineer**, *Arm*, Cambridge, UK.
2016 System integration: involved in the creation of an entire system with all Arm IPs
- Winter 2008 **Freelance Designer**, Rimini, Italy.
Designed and built an automatic commutation device for Paine s.n.c as freelance designer.
- Summer 2008 **Electrician**, *Eurotec s.r.l.*, Rimini, Italy.
Industrial plants electrician.
- Summer 2007 **Installer**, *Paine s.n.c.*, Rimini, Italy.
Naval electronic devices installer.
- Winter 2007 **Internship**, *Protec*, Rimini, Italy.
I spent two week in a PCB assemble company where I acquired PCB soldering ability.

Interests and Hobbies

Technology, Electronics, Informatics, Embedded Systems, Digital Design, Parallel Computing, Networking, System Administration, IT security, Photography, Music, Science, Physics, Snowboarding, Skateboarding, Swimming, Motorbikes, Cooking