Simone Shawn Cazzaniga

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CONTACT

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ABOUT ME

My innate curiosity towards the world has led me to study engineering, and I always strive to learn more in both academic and practical ways. I let my passions for engineering, music and volunteering fuel each other, striving for an all-around personal growth. I have been lucky enough to have experienced working in groups, and sometimes leading or mediating between different ones in order to resolve complex problems; I have had the chance to handle performances in public and teach. I am constantly looking for ways to combine passion and technology to build something beautiful, and useful.

WORK EXPERIENCE

21/08/2023 – CURRENT Milan, Italy

Design Engineer - DSP/Electroacoustics R&D BdSound

Working within the Electroacoustics division of Innovation team:
- **State of the art audio algorithms** prototyping (Python) and implementation (C99 / C++20)
  - Dynamic BEV Engine sound generation
  - Echo/Feedback Cancellers
  - Spatial sound algorithms
  - Simple Media Processing algorithms (Compander, Multiband Limiter, PEQ, ...)
- **Pybind11** for creating bit-perfect Python bindings of C code for both traditional and machine learning/AI audio algorithms.
- **JUCE (C++20)** for frontend of audio applications
- Writing and presentation of internal academic workshops on fundamentals of Signal Processing, with extensive python interactive visualization.

Website www.bdsound.com

11/2022 – 03/2023

Author for RISC-V Fundamentals (LFD210) course RISC-V Foundation

I have written content and self-evaluation questions for Chapter 3 through 6 of the **RISC-V Fundamentals (LFD210) course**, covering the details of the RISC-V ISA base, extensions, privilege levels and memory model. The author of each section was required to review other authors' content and give feedback in order to make the writing style, detail of topic coverage and question difficulty uniform across the whole course.

Website https://training.linuxfoundation.org/training/riscv-fundamentals-lfd210/

02/2023 – 07/2023

Research Engineer Intern [PhD] ST Microelectronics

I have studied complex large optimization problems in Design Space Exploration of Networks on Chip to speed the development of complex ASIL-D MPSoCs for Automotive.

EDUCATION AND TRAINING

12/2022 – 07/2023 Milano, Italy

Industrial PhD in Information Engineering [Interrupted] Politecnico di Milano

Address Piazza Leonardo da Vinci, 32, 20133, Milano, Italy │ **Website** https://www.polimi.it/

03/2020 – 12/2022 Milano, Italy

Master Degree in Music & Acoustics Engineering Politecnico di Milano

The Master's Degree program was centered around building an expertise on representation, modeling, manipulation and rendering of signals, expecially audio signals, speech, vibrational fields.

I have attended the MMI Track (Music emphasis on audio and sound signal processing)

Thesis covered the state of the art and cognitive impact of low level visual hardware simulators for computer architecture and audio processing applications. Open source tools based on existing projects were developed to show the shortcomings of current offerings and an in-depth requirements analysis was conducted as reference for future work in the field.

Address Piazza Leonardo da Vinci, 32, 20133, Milano, Italy | **Website** https://www.polimi.it/ | **Final grade** 110/110 | **Level in EQF** EQF level 7

2020 Milano, Italy

Laurea Triennale in Ingegneria dell'Automazione Politecnico di Milano

Address Piazza Leonardo da Vinci, 32, 20133, Milano, Italy | **Website** https://www.polimi.it/

2016 Monza, Italy

Diploma di Liceo Classico Liceo Classico Bartolomeo Zucchi

Address P.za Trento e Trieste, 6, 20900, Monza, Italy | **Website** https://liceozucchi.edu.it/it/index.do

LANGUAGE SKILLS

MOTHER TONGUE(S): Italian

Other language(s):

English

Listening C2	
Spoken production C1	
Reading C2	
Spoken interaction C1	
Writing C2	

Chinese

Listening A1	
Spoken production A1	
Reading A2	
Spoken interaction A1	
Writing A1	

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

DSP & ACOUSTICS

JUCE Framework | Digital Signal Processing (DSP) | Linear Predictive Coding (LPC) | Wave Digital Filters | FEM Simulation | SuperCollider (basics) | Open Sound Control (OSC) | Reaper Digital Audio Workstation

DEVELOPMENT & OS

Linux | C / C++ / C# Languages | Python | IDEs (Intellij Idea, VSCode) | Google Play Developer | Flutter Developer (Android and Web) | MATLAB | pybind11 | HTML CSS JS | Machine Learning in Python | Github Pages | VirtualBox (basics)

INSTRUCTIONAL DESIGN

LaTeX | Jupyter NoteBook | openFrameworks | Processing (Creative Programming) | Animation in manim | Unity (basics)

COMPUTER ARCHITECTURE

RISC-V | Logic Circuit | Computer Architectures | FPGA basics

NETWORKS AND MEMBERSHIPS

2019 – CURRENT

RISC-V International Individual Member

I have partecipated in the Academia SIG and have been sponsored to attend in person at the RISC-V Summit 2021, a three days event with multiple academic and industry conferences on the topic of RISC-V ecosystem. I later partecipated in the RISC-V Summit 2023 in Barcellona as a PhD Student.

DRIVING LICENCE

Driving Licence: B

PROJECTS

09/2019 – CURRENT

IdPN Flutter Android App and Website

I have acted as Main Software Engineer and Designer for the "IdPN" (Indice delle Parole Notevoli) Android App and Website (idpn.magiwanders.com). This is a personal project carried out in partnership with a friend since high school times.

Link https://idpn.magiwanders.com

07/2022 – CURRENT

SHEAS - Simple Hardware Editor And Simulator

The project is a wrapper of DigitalJS specifically geared towards computer architecture.

Link https://sheas.magiwanders.com

2022

Introduction to Pipelining

Online interactive lesson on pipelining using my own Hardware Simulator SHEAS.

Link https://pipeline-lesson.magiwanders.com/1_introduction.html

03/2021 – 11/2022

Nand2Tetris Online JS Simulator Reimplementation

I re-implemented from scatch a simulator of the Hack computer from Nand2Tetris course in Javascript and published it in a static page.

Link https://hack-computer.magiwanders.com

2021

RISC-V RV32IMAC Sliderules

A speadsheet-like exploded view of RV32IMAC encoding space with color coded information, much thought has been put into the best way of representing information in three dimensions (2D sheed and colour).

Link https://drive.google.com/file/d/1TnPdlPaC1M5qW9Qs7V2uvzs-2OROF_Cz/view

MANAGEMENT AND LEADERSHIP SKILLS

I lead in tune with emotions

When it comes to handling the responsibility of group work, I always try my best to read the room and dynamically lay out plans based on my team's and my own emotions, in order to maximise the quality of the work and the satisfaction of everyone involved.

ORGANISATIONAL SKILLS

An Engineer's perspective

- **Work from first principles** - I love pulling apart knowledge, understanding its structure down to the fundamentals, enabling deeper understanding and better insight into things I learn, and challenging every assumption stemmed from what I already know.
- **Strive to see the big picture** - I recognise that importance of considering the context around ideas and data, as their coexistence is what makes them meaningful. Every day I gain broader trans-disciplinary knowledge across many fields, often beyond engineering, with the hope of deepening my understanding and adapting better to new problems and environments.
- **Work more to work less** - I put great effort into permanently automating the resolution of recurrent issues, so that I can constantly reduce the overhead of my work and be more productive. At the same time when evaluating and implementing solutions, I always try to consider their whole lifetime of cost versus actual improvement they bring to avoid being blinded by their immediate usefulness.
- **Tackle challenges methodically** - I think that scheduling tasks in a correctly prioritised order is the most important part of tackling work successfully, and within time and budget constraints. I pay great attention to detail, after the big strategic issues are solved, and to what tasks can be parallelised, in order to optimise effort.

CREATIVE WORKS

2022

¿Che Verso Fa il Grasino?

I have participated as co-writer and keyboardist for the songs of this album from the amateur comedy prog-rock band "Idiofoni", of which I am co-founder in 2014. The album is available on Spotify and all songs are registered at SIAE with percentages proportional to my contributions.

Link https://open.spotify.com/album/1JtbDcAHuY9M48ExpZY3AU?si=Yg4-ZMU0SU2gDTlyI4RwMw

2019

Alice and The Wonder OST

I have participated as co-writer, keyboardist and recording technician for the album version of the original live theatre soundtrack from "Alice and the Wonder", a derivative theatre show by the "Ginsong" amateur theatre company.

Link https://www.facebook.com/ginsongmusicals

COMMUNICATION AND INTERPERSONAL SKILLS

What I try to achieve when dealing with professional and volunteering environments

- **Collaborate openly** - I value of straightforward, focused, goal driven communication, the power of listening and being pro-active.
- **Precious feedback** - I always try to welcome and encourage people to openly sharing their thoughts on my work, as it is an effective way to constantly challenge my decisions and improve my output.
- **Building trust through good work** - Good collaborative work builds trust, not the other way around. Listening and being pro-active, being fair in sharing accountability, encouraging reciprocal teaching are all qualities that minimise people working in the way of others, making a group work well together.

VOLUNTEERING

05/2023 – 11/2023

RISC-V/LFX Mentor

- **Bringing the "Sliderules" Cheat Sheets to the Web Mentorship (Summer 2023) -** Together with Keith Graham from Codasip - The resulting work was then presented by the mentee Jayaraj J at DebConf2023 in a talk and by the mentee Siyu Chen at RISC-V Summit China 2023 with a poster.
- **Add F-extension support to "Ripes" RISC-V Micro-Architectural Visual Educational Simulator (Autumn 2023) -** To gether with Morten Borup Petersen from Microsoft and creator or Ripes**.**

Links https://sliderules.magiwanders.com ⎮https://mentorship.lfx.linuxfoundation.org/mentor/3666f952-ed43-462f-b6eb-77d58b83ceff ⎮https://mentorship.lfx.linuxfoundation.org/project/d2429c71-6a57-4de1-ba57-ac4f808d020c ⎮https://mentorship.lfx.linuxfoundation.org/project/1809398d-6c7b-4f30-add5-90e784a35d89 ⎮https://debconf23.debconf.org/talks/36-risc-v-meets-information-design-the-interactive-sliderules-instruction-set-architecture-cheatsheets/ ⎮https://github.com/mortbopet/Ripes

2017 – CURRENT

Service Civil International (SCI)

- **Camp Coordinator**
  - **Chivasso, Italy - July 2023** - Camp code IT-SCI 10.2 - I partially coordinated an international workamp at "Orto di Comunità" Cooperative, enabling basic maintenance of the cooperative lands and helping with sorting, tidying and stocking of recycled building material.
  - **Rome, Italy - August 2022** - Camp code IT-SCI 13.1 - I coordinated an international workcamp for SCI at the "Semi di Comunità" C.S.A. (Community Supported Agriculture) farm. Task was to stimulate and manage the cooperation between SCI, the host organisation (the CSA) and the international volunteers, be responsible for the coordination of the group's work and conflict management, in addition to sharing all the other volunteer tasks at the farm like weeding, harvesting, transplanting, vegetable maintenance and cultivation techniques, eco-construction, general maintenance of the farm.
- **Local Volunteer for 3-days Training Events - 2021-2024** - I have helped organizing a few SCI Lombardia 3-day events in **Cesano Maderno,Italy** at the "Nicodemo" community house geared towards educating outgoing volunteers to sensible themes on the current geopolitical world landscape, inequality, conflicts and ethical intercultural communication and social media use while volunteering and travelling in at-risk countries.
- **International Volunteer**
  - **Yerevan, Armenia - July 2019** - Camp code *AM-HUJ 18.4* - I volunteered through the International Civil Service with HUJ association in Yerevan, Armenia for a children rehabilitation hospital. Tasks were construction, general maintenance and support to the doctors performing rehabilitation. HUJ is the State Youth Corps of Armenia and is involved with varied activities throughout the entire country.
  - **Aldeia Nova, Portugal - September 2017** - Camp code PT-BG-26-17 - I volunteered through the International Civil Service with the Palombar association in Aldeia Nova, Portugal for an archeology project excavating a Roman era olive press. Tasks were mapping and excavating sites of interest, cleaning and organizing findings as well as make geometric measurements for potential new excavation sites. Palombar works for the preservation of the cultural landscape of norteastern Portugal.

Link https://sci.ngo/

2020 – 2021 Cernusco Lombardone, Italy

A.G.E.S.C.I.

I volunteered for 1 academic year in the local Scouts group "Cernusco Lombardone 1", jointly handling and coordinating weekly activities for a group of about 30 12-16 years olds, and their 2 week summer camp.

02/2019 Banska Stiavnica, Slovakia

Workaway International Volunteer

I volunteered at Eleuzina Cultural Centre in Banska Stiavnica, Slovakia, partecipating in the renovation of their main building. Tasks were making and pouring concrete for floors, plastering walls, powersanding and chainsawing wooden beams.

ONLINE & SINGLE COURSES

2024 – CURRENT

Computational Acoustics (Auditor)

- **Numerical Modeling & Simulation in Acoustics** (054274 from Milan Polytechnic) - An in-depth study of the mathematics behind FEM simulation, specifically gearing it towards multiphysics acoustics simulations, with subsequent implementation in MATLAB/Python.

Link https://www11.ceda.polimi.it/schedaincarico/schedaincarico/controller/scheda_pubblica/SchedaPublic.do?&evn_default=evento&c_classe=837524&__pj0=0&__pj1=8d3f8d8d360ab51d3bad21b1048d29bb

2025 – CURRENT

User Experience Research and Design Specialization (Auditor)

- **Introduction to User Experience Principles and Processes**
  - University of Michigan - Instructors: Mark Newman
  - The course gives an introduction on the history and fundamental principles of the discipline of UX Design and Research.

06/2023 – 07/2023

Science, Technology and Wikipedia PhD Course

The purpose of this PhD Course from the Polytechnic School of Milan was to guide students towards meaningful and high quality contributions to the open knowledge movements/platforms of which Wikipedia is but the most widespread. I contributed on the italian and engligh pages about Digital Delay Lines, in particular adding their detailed theoretical description.

Link https://en.wikipedia.org/wiki/Digital_delay_line

2020 – 2021

Computer Architecture (Auditor)

- **Build a Modern Computer from First Principles: from Nand to Tetris (Part 1 & 2 on Coursera)**
  - Hebrew University of Jerusalem - Instructors: Shimon Shocken, Noam Nisan
  - The course deals with letting the student build piece by piece and abstraction over abstraction a simple, yet complete computer. The journey starts with simple nand gates, and builds circuits, memories, ALU, CPU and the complete processor. Then it builds on it by making the student program from scratch a virtual machine, a compiler for a basic programming language, and finally a simple operating system.
- **RISC-V Foundation Courses (EdX)**
  - **Building a RISC-V CPU Core (LFD111x) -** implementation of a simple RISC-V processor covering a subset of RV32I using Transaction Level Verilog.
  - **RISC-V Toolchain and Compiler Optimization Techniques (LFD113x) -** basic overview of the development environment around RISC-V, compilers and toolchain.

Links https://www.coursera.org/learn/build-a-computer |https://www.coursera.org/learn/nand2tetris2 |https://www.edx.org/course/building-a-risc-v-cpu-core |https://www.edx.org/course/risc-v-toolchain-and-compiler-optimization-techniques