# Davide Lionetti

Audio software Engineer

## CONTACT ME


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## SKILLS

### Programming libraries/software

NumPy, Librosa, Scikit-learn, TensorFlow, Keras, Git, JUCE, Visual Studio, Ableton, MAX/MSP, Windows OS

### Primary fields of study

Computer music, DSP, Music info retrival, AI & Deep learning, Sound Analysis/synthesis, Integrated electronic circuit, Computational Creativity

### Languages

Italian

English

TOEIC: 890/990. September 2020.

## PROGRAMMING

Python

HTML/CSS/Js

Java

SQL

Supercollider

Matlab

Latex

## ABOUT ME

Resilient, cheerful and passionate musician-engineer with the goal of merging his technical studies with his creative side. I love collaboration in developing innovative and cutting-edge audio applications, especially in the field of **Human Computer Interaction and Augmented musical instrument.**

Topics of interest: Music information retrieval, Deep Learning, IoMusT, Smart Musical Instrument (see potfolio pg. 2).

## EDUCATION

### Master of Science

Politecnico di Milano, Italy — 2020 - 2023

**Music and Acoustic Engineering**

- Multimedia signal processing, sound analysis and synthesis, electronic&eletroacoustic, computer graphic, web development , music information retrieval, acoustic.
- Creative programming through AI and Deep Learning, computer music software design.

**Grade: 107/110**

### Bachelor of Science

University of Padua, Italy — 2016 - 2019

**Information Technologies Engineering**

- Mathematic, physics, probability calculation and combinatorial analysis.
- Object-oriented programming, standard network protocols, software and relational database design, circuit theory and microelectronics, artificial intelligence.
- Programming languages Java, Python, SQL.

### Pubblications

- Lionetti, D., Pappas, A., Comanducci, L., Bernardini, A., Zanoni, M., Sarti , A, Yee-King, M. & D'Inverno, M. *"HandMonizer: a case study for personalized digital musical instrument design"*, accepted at 4th International Symposium on the Internet of Sound (IS22023), 2023. (see potfolio pg. 2).

## JOB EXPERIENCE

### HCI Engineer - Intern

LWT3, Milan, Italy — Nov - July 2022

https://github.com/EllDy96/Augmented-Guitar-Pedalboard

I interned at LWT3 to develop my M.Sc thesis research, under the guidance of Prof. **Massimilani Zanoni**. I contributed to the creation of an ICT protocol to integrate the company's wearable sensors within an artistic performance, resulting in an innovative **smart audio effect** based on the interpretation of muscle signals. (follow the link for further detailes).

Main field: Human-Computer Interaction, Deep Learning, Wearable Devices, Biosignals analysis.

### Barman and Commis waiter

Bill's Restaurant, Cambridge, Uk — 2019 - 2020

- Management skills: teamwork to guarantee the best experience for the customers.
- Mastery of the English language gained from continuous interaction with native speakers.

# PORTFOLIO

### Handmonizer: An Artist-Oriented Vocal Improvization Tool

Apr 2020 - Jul 2022

Music Interaction design
Hand gesture recognition
Human-computer interaction
Digital musical instrument
Supercollider, JS, ml5, MIDI, OSC.

Politecnico di Milano, Italy

https://github.com/EllDy96/Handmonizer

The Handmonizer is an artist-oriented **smart audio effect,** tailored to the needs of the jazz singer *Maria Pia de Vito*; We develop a polyphonic harmonizer which changes its setting using hand motion recognition. The papper will be presented at 4th International Symposium on the Internet of Sound (IS22023), 2023. Full description and video in the link.
**Advisors**: Augusto Sarti, Mathew Yee-king, Mark D'inverno

### 3Dreams: an artistic VR Experience

Dec 2021 - Feb 2022

Music emotion recognition,
Creative programming
AI, Python, JS, MIR
Virtual Reality.
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Politecnico di Milano, Italy

https://github.com/EllDy96/3Dreams

3Dreams is a v**irtual reality web application** utilizing deep learning techniques to create an immersive environment that dynamically responds to the emotional contour of a user-selected musical track. It enhances the music listening experience by visually representing the emotions conveyed by music through interactive shapes and colors.
**Advisors**: Massimiliano Zanoni, Luca Comanducci

### The Handy fm synthesizer

May 2021 - Jun 2021

FM Sound Synthesis
Hand gesture recognition
Supercollider, Animation design
JS, P5.js, MIDI, OSC.

Politecnico di Milano, Italy

https://github.com/EllDy96/ComputerMusicProjects/tree/Homework3

**Augmented musical instrument**, which introduces a new interaction strategy, enabling real-time modulation of FM synthesis parameters through hand movements, using a deep neural network for hand movement recognition, allowing users to control the synthesizer intuitively. Comprehensive documentation and a Video Demo available in the link.
**Advisor**: Fabio Antonacci

### Synesthetic

Dec 2020 - Feb 2021

Web app , Rythmic analysis
Creative Programming
Beat tracking
Python, JS.

Politecnico di Milano, Italy

https://github.com/EllDy96/Synesthetic

Synesthetic is a **web application** that visually represents the real-time rhythmic structure of user-uploaded songs, inspired by Mondrian paintings. Users upload audio files with rhythmic recordings, such as drum beats. The application performs a rhythmic analysis, separating different periodicities present in the rhythm to create distinct visualizations. This dynamic interface serves as an informative tool for rhythm visualization.
**Advisors**: Franesco Bruschi, Vincenzo Rana.

### Elaboration of a Lead Sheet Dataset for Computational Creativity Systems.

Aug 2019 - Sep 2019

Computational Creativity
Algorithmic composition
Markov chain, Python
Music21, MySQL.

Padua University, Italy

https://github.com/EllDy96/AlgorithmicComposer

Development of a **computational creativity system** for automatic generation of monophonic melodies using a Markov chain, for my B.Sc thesis. Initial music information retrieval step analyzing over 1200 scores from the "Nottingham Dataset" with Python's Music21 library. The designed Markov chain emulates the human process of "combinatorial creativity" for melody generation.
**Thesis supervisor**: Antonio Rodà.
**Co-supervisor**: Filippo Carnovallini.