



# Davide Lionetti

## Audio software Engineer

### CONTACT ME

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- 📍 Gent, Belgium
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- 🌐 <https://www.linkedin.com/in/davide-lionetti/>

### SKILLS

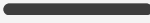
#### Programming libraries/software

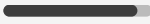
NumPy, Librosa, Scikit-learn, TensorFlow, Keras, Git, JUCE, Visual Studio, Ableton, MAX/MSP, Windows OS

#### Primary fields of study

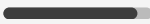
Computer music, DSP, Music info retrieval, AI & Deep learning, Sound Analysis/synthesis, Integrated electronic circuit, Computational Creativity

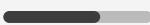
#### Languages


Italian 


English   
TOEIC: 890/990. September 2020.


### PROGRAMMING

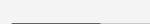
Python 

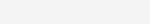
HTML/CSS/Js 

Java 

SQL 

Supercollider 

Matlab 

Pure Data 

### 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: Extended Reality, Music information retrieval, Deep Learning, IoMusT, Smart Musical Instrument (see portfolio pg. 2).

### EDUCATION

#### PhD Art and Science 2024 - 2028

📍 Gent University, Belgium

- Researching on group synchronization in musical ensembles to develop a computational model able to synchronize a humanoid avatar with other humans during musical tasks in **Extended Reality**.
- Member of the **Institute of Psychoacoustic and Electronic Music** of Gent University.

#### M.Sc. Music Engineering

📍 Politecnico di Milano, Italy  2020 - 2023

- Multimedia signal processing, sound analysis and synthesis, electronic&electroacoustic, computer graphic, web development, music information retrieval, acoustic.
- Creative programming through AI and Deep Learning, computer music software design. **Grade: 107/110**

#### B.Sc. IT Engineering

📍 University of Padua, Italy  2016 - 2019

- 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.

### JOB EXPERIENCE

#### HCI Engineer - Intern

📍 LWT3, Milan, Italy  Nov - July 2022

📄 <https://github.com/EILDy96/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. **The result has been published in The NIME 2024 conference:**

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

Politecnico di Milano, Italy

<https://github.com/EIIDy96/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 paper will be presented at 4th International Symposium on the Internet of Sound (IS202023), 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

Politecnico di Milano, Italy

<https://github.com/EIIDy96/3Dreams>

3Dreams is a **virtual 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

Politecnico di Milano, Italy

<https://github.com/EIIDy96/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

Politecnico di Milano, Italy

<https://github.com/EIIDy96/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:** Francesco Bruschi, Vincenzo Rana.

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

Aug 2019 - Sep 2019

Padua University, Italy

<https://github.com/EIIDy96/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.

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

Music emotion recognition,  
Creative programming  
AI, Python, JS, MIR  
Virtual Reality.

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

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

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