



Eleonora Annamaria Borsani Villa

Date of birth: 14/04/1997 | Nationality: | Gender: |

Phone number: | Email address:

Address: |

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ABOUT ME

I am a PhD student in Neuroengineering at the University of Genoa, with a specific focus on the temporal aspects of multisensory integration (visual-auditory) and time perception. I am self-motivated, curious and energetic, demonstrating superior performance in both independent and collaborative environments.

WORK EXPERIENCE

01/11/2023 – CURRENT Genova, Italy

PH.D. STUDENT IN BIOENGINEERING AND ROBOTICS UNIVERSITY OF GENOA

During my Phd, my objective is to investigate both temporal aspects of multisensory integration (visual-auditory) and time perception using virtual reality to create experimental setups that are more ecological, natural, and engaging. The aim is to assess these aspects in individuals with psychiatric disorders such as ADHD and Eating Disorders, with the purpose of not only finding new diagnostic methods but also developing new rehabilitation protocols.

09/2022 – 10/2023 Genova, Italy

ACADEMIC TUTOR UNIVERSITÀ DEGLI STUDI DI GENOVA

Support students with Specific Learning Disorders and/or disabilities during the studying of Maths (Algebra, Analysis I and II), Chemistry and Physics.

09/2016 – 09/2021 Firenze, Italy

PRIVATE MATH AND PHYSICS TUTOR

Tutoring students in private sessions using detailed lesson plans and explaining maths and physics concepts in a caring and encouraging environment. Also teaching students struggling with dyscalculia and dyslexia.

EDUCATION AND TRAINING

09/2021 – 10/2023 Genova, Italy

MASTER DEGREE IN BIOENGINEERING Università degli studi di Genova

The objective of my thesis is to assess the potential influence of wearing a Covid face mask on sound localization, both at physical and perceptual level.

To evaluate possible differences at the physical level, I conducted a comparison between the HRTFs obtained from a mannequin when wearing or not wearing the mask. I used both the traditional measurement approach in the anechoic chamber and a simulation-based method using *MeshToHRTF*, an open-source software package that allows to calculate the HRTF based on a 3D mesh of the head. The HRTFs with and without the mask are compared using specific parameters, such as the interaural time difference (ITD), interaural level difference (ILD), the spectral distortion (SD) and the perceptual spectral distortion (PSD).

To evaluate the impact of wearing a mask on spatial localization of sounds at the perceptual level, an experimental setup is designed and implemented specifically for assessing sound localization abilities, particularly in terms of elevation. The experiment involves the use of speakers positioned at different elevations to present sound stimuli. Participants are instructed to listen to these stimuli and indicate the perceived location of the sound source. Psychophysical data is collected in two different conditions: with

and without wearing a mask. Once the data is collected, statistical analysis is performed to identify any significant differences in sound localization abilities between the two conditions.

Address Via all'Opera Pia 13, 16131, Genova, Italy | **Field of study** Neuroengineering | **Final grade** 110 Cum Laude |

Thesis "Evaluating the effect of face masks on audio-spatial spectral sensitivity"

09/2016 – 05/2021 Firenze, Italy

BACHELOR DEGREE IN ELECTRONIC AND TELECOMMUNICATIONS ENGINEERING Università degli Studi di Firenze

- Skills:** Specific skills in the design and production of electronic circuits, devices and systems. Carrying out technical-operational management activities and supporting technical and entrepreneurial development initiatives in the sector. Particular interest in biomedical and clinical applications.
- Study Abroad:** 6 months Erasmus experience in Spain, Alcalà de Henares (Madrid), 2019

Address Via di Santa Marta, 3, 50139, Firenze, Italy | **Field of study** Electronic Engineering | **Final grade** 105/110 |

Thesis "Indoor navigation system for healthcare facilities"

09/2011 – 06/2016 Firenze, Italy

HIGH SCHOOL DIPLOMA Liceo Scientifico Guido Castelnuovo

Address Via della Colonna 10, 50121, Firenze, Italy | **Final grade** 96/100

● LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C2	B2	B2	B2
SPANISH	B2	B2	B2	B2	B2
FRENCH	A2	A2	A1	A1	A1

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

● DIGITAL SKILLS

Microsoft Word | Microsoft Excel | Microsoft Powerpoint | Google Docs | Google Drive | Outlook | Skype | Zoom

Technical Skills

MATLAB & Simulink | Unity 3D. | Python | Arduino | Data Analysis | basic knowledge of C language, HTML and CSS

● ADDITIONAL INFORMATION

LANGUAGE CERTIFICATIONS

06/09/2021

IELTS English certification

Test Results:

Listening - 8 (C2 level)

Reading - 8.5 (C2 level)

Writing - 6.5 (B2 level)

Speaking - 6.5 (B2 level)

Overall Band Score - 7.5 (C1 level)

PUBLICATIONS

[Designing and developing a mobile application for indoor real-time positioning and navigation in healthcare facilities](#)

– 2022

This paper presents an IPS implemented as a mobile application that can guide patients and visitors throughout a healthcare premise. The proposed system exploits the geolocation capabilities offered by existing navigation frameworks for determining and displaying the user's position. A hybrid mobile application architecture has been adopted because it allows to deploy the code to multiple platforms, simplifying maintenance and upgrading.

PROJECTS

Neural Population Dynamics Project of the course Neural Signal Analysis. The aim of this project is to investigate how the behaviour of the brain areas (sensorimotor cortex S1 and the premotor cortex PM) involved in the production of movement, changes before and after a lesion involving the primary motor cortex M1. To do so, rat models have been used as study subjects. The pre-processed data are analysed exploiting the Principal Component Analysis (PCA). Each data point of the Principal Components (PCs) is drawn on a plot, flowing a trajectory representing how the recorded neural activity changes over time. These curves are denominated Neural Population Dynamics (NPDs).

Izhikevich Model for simulating Regular Spiking (RS) and Low-threshold spiking (LTS) activities. Project of the course Computational Neuroscience.

Cochlear Implant Simulation with a Filter Bank Project of the course Neurosensory Engineering.

Retinal Prosthetics Project of the course Neurosensory Engineering. Aim of that assignment is to develop a basic simulator that reproduces visual perception with an epiretinal prostheses.

Eye Tracking and Visual Assessment using the PupilLab Eyetracker Project for the Research Track Activity. The aim of the laboratory activity is to learn the techniques for recording human eye movements and the design of experimental setup for measurement of Human EyeMovements to Study Visual Spatial Functions and Dysfunctions, Gaze Orienting and Saccadic System.

Hand tracking for Virtual Reality Project of the Course Software Technologies for Human Computer Interactions. Comparison between Leap Motion and Oculus Quest 2.

Geographical Distribution of Plant Species Project for the course of Analysis of Biomedical Signals and Data. The aim of this project is to try and determine the main climate regions of North America by looking at the distribution of plant species in US states and Canadian provinces, exploiting factor analysis techniques (PCA,FA,ICA). In particular, it is assumed that the plant species with similar climatic needs will exhibit a matching geographical spreading. A further purpose consists in performing a cluster analysis on the same dataset, in order to assess whether the obtained groups of regions can be interpreted in a meaningful way.

COMMUNICATION AND INTERPERSONAL SKILLS

Strong team player

Excellent organizational skills

Willingness to accept new challenges with energy and enthusiasm

Self motivated

Good listener and communicator

HOBBIES AND INTERESTS

2019-2022: Aerial silk for acrobatics and circus

2009-2017: Member of Banda Polverosa of Florence and Toscana Junior Band. Instrument: transverse flute

2007-2016: Tennis player at pre-competitive level