Luca Comanducci

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Research Interests

My research lies at the intersection of machine learning, generative modeling, and signal processing for audio and music. I have contributed to both foundational and applied aspects of audio AI, spanning spatial audio, sound field reconstruction, source localization, and efficient deep learning architectures. In recent years, my focus has shifted toward the human-centric, ethical, and societal dimensions of generative audio models. This includes studies on energy consumption of text-to-audio diffusion models, interpretability of deep models, dataset design for text-to-music generation, and methods for detecting memorization, membership inference, and deepfakes in audio systems.

Education

Politecnico di Milano   *Milan, Italy*
PH. D. INFORMATION TECHNOLOGY (CUM LAUDE)   *Nov 2018 - March 2022*
- Advisor: Prof. Augusto Sarti
- Thesis title: Intelligent networked Music PERforMANce ExperieNCEs (IMPERMANENCE)
- Final Grade: cum laude

Universitat de València   *Valencia, Spain*
VISITING PH.D. STUDENT   *11 July 2021 - 20 July 2021*
- Supervisor: Prof. Maximo Cobos
- Topic: Deep learning models for acoustic source localization.

Politecnico di Milano   *Milan, Italy*
M.SC. IN COMPUTER SCIENCE AND ENGINEERING   *Oct. 2015 - April 2018*
- Advisor: Prof. Fabio Antonacci
- Thesis title: Convolutional neural networks applied to space-time audio processing applications
- Final Grade: 110/110

Universidad Carlos III de Madrid   *Madrid, Spain*
ERASMUS EXCHANGE PROGRAM   *Sep. 2013 - Feb. 2014*
- Courses in Audiovisual and Computer Engineering

Università degli Studi di Milano   *Milan, Italy*
B.SC. IN MUSIC INFORMATION SCIENCE   *Oct. 2011 - Oct. 2014*
- Advisor: Prof. Luca Andrea Ludovico
- Thesis title: Physical modeling audio synthesis using Max/Msp
- Final Grade: 102/110

Professional Experience

Politecnico di Milano, Department of Electronics Information and Bioengineering   *Milan, Italy*
NON-TENURE-TRACK ASSISTANT PROFESSOR (RICERCATORE A TEMPO DETERMINATO DI TIPO A)   *July 2024 - Ongoing*
- Research on generative and ethical AI for music creation, combining MIR and deep learning approaches.
- Development of text-to-music and fake music detection dataset.
- Supervision of M.Sc. students and coordination of open-source research activities

Politecnico di Milano, Department of Electronics Information and Bioengineering   *Milan, Italy*
POSTDOCTORAL RESEARCHER (ASSEGNISTA DI RICERCA)   *April 2022 - June 2024*
- Research on spatial audio processing and deep learning for music signal analysis.
- Development of data-driven tools for 3D sound rendering and perception modeling.
- Co-Supervision of M.Sc. students.

Publications

Bibliometrics

Google Scholar (Query Date 15/01/2026) → H-index: 13, Publications: 40, Citations: 521
Scopus (Query Date 15/01/2026) → H-index: 11, Publications: 32, Citations: 332, Citing Articles: 277
Web of Science (Query Date 15/01/2026) → H-index: 8, Publications:24, Citations: 202, Citing Articles: 177

International Journals

Publications where L.C. is corresponding author are marked with * after his name.

[J12] Negroni, V., Salvi, D., **Comanducci, L.**, Wani, T.M., Uecker, M., Amerini, I., Tubaro, S. and Bestagini, P., 2025. **LJ-TTS: A Paired Real and Synthetic Speech Dataset for Single-Speaker TTS Analysis.** *Electronics*, 15(1), p.169.

[J11] Rinaldi, C., Centofanti, C., **Comanducci, L.**, Pezzoli, M., Bernardini, A., & Antonacci, F. (2025). **Immersive Acoustics via Next-Generation Networks: Achieving High-Fidelity Audio in the Metaverse**, *IEEE Open Journal of the Communications Society*

[J10] Ronchini, F., **Comanducci, L.**, Perego, G. & Antonacci, F. (2025). **PAGURI: Prompt Audio Generator User Research Investigation**, *Electronics* 14(17), 3379;

[J9] **Comanducci, L.**, Bestagini, P. & Tubaro, S. (2025). **FakeMusicCaps: a Dataset for Detection and Attribution of Synthetic Music Generated via Text-to-Music Models** , *Journal of Imaging*, 11(7), 242.

[J8] **Comanducci, L.***, Antonacci, F., & Sarti, A. (2024) **Synthesis of soundfields through irregular loudspeaker arrays based on convolutional neural networks**, *EURASIP Journal on Audio, Speech, and Music Processing*

[J7] Miotello, F., Pezzoli, M., **Comanducci, L.**, Antonacci, & Sarti, A. (2023). **Deep Prior-based Audio Inpainting Using Multi-Resolution Harmonic Convolutional Neural Networks**, *IEEE/ACM Transactions on Audio, Speech, and Language Processing*

[J6] **Comanducci, L.***, Gioiosa, D., Zanoni, M., Antonacci, F., & Sarti, A. (2023) **Variational Autoencoders for Chord Sequence Generation Conditioned on Western Harmonic Music Complexity**, *EURASIP Journal on Audio, Speech, and Music Processing*

[J5] Battello, R., **Comanducci, L.***, Antonacci, F., Cospito, G., & Sarti, A. (2021). **Experimenting with adaptive metronomes in networked music performances**, *Journal of the Audio Engineering Society*, 69(10), 737-747.

[J4] **Comanducci, L.***, Bestagini, P., Tagliasacchi, M., Sarti, A., & Tubaro, S. (2021). **Reconstructing speech from cnn embeddings**, *IEEE Signal Processing Letters*, 28, 952-956.

[J3] **Comanducci, L.***, Borra, F., Bestagini, P., Antonacci, F., Tubaro, S., & Sarti, A. (2020). **Source localization using distributed microphones in reverberant environments based on deep learning and ray space transform**, *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, 28, 2238-2251.

[J2] Cobos, M., Antonacci, F., **Comanducci, L.**, & Sarti, A. (2020). **Frequency-sliding generalized cross-correlation: A sub-band time delay estimation approach**, *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, 28, 1270-1281.

[J1] Delle Monache, S., **Comanducci, L.**, Buccoli, M., Zanoni, M., Sarti, A., Pietrocola, E., Berbenni, F. & Cospito, G. (2019). **A presence-and performance-driven framework to investigate interactive networked music learning scenarios**, *Wireless Communications and Mobile Computing*, 2019.

International Conferences

[24] Messina, F., Ronchini, F., **Comanducci, L.**, Bestagini, P., Antonacci, F. (2026). **Mitigating data replication in text-to-audio generative diffusion models through anti-memorization guidance**, *2026 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*

[C23] Superbo, R., Gafencu, S. C., Perego, N., Bernardini, A., **Comanducci, L.**, & Oreggia, E. (2024). **A User Study on Electromagnetic Interactions with REBUS**, *IEEE International Symposium on the Internet of Sounds, 2025*

[C22] Ronchini, F., **Comanducci, L.**, Marcucci, S. & Antonacci, F. **AI-Assisted Music Production: A User Study on Text-to-Music Models**, *17th International Symposium on Computer Music Multidisciplinary Research, 3-7 November 2025, London, UK*

[C21] Passoni, R., Ronchini, F., **Comanducci, L.**, Serizel, R. & Antonacci, F. **Diffused Responsibility: Analyzing the Energy Consumption of Generative Text-to-Audio Diffusion Models** , *2025 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*

[C20] Mezza, A. I, Comanducci, L., Maucione, G., Zanoni, M., **"Beyond Binary Patterns: A Preliminary Study on the Effect of Dynamic Accents on Rhythm Complexity.** The 26th International Society for Music Information Retrieval Conference (ISMIR) - Late Breaking Demo. Daejeon, Korea. 2025.

[C19] Colombo, M. F., Ronchini, F., **Comanducci, L.**, & Antonacci, F. (2024). **MambaFoley: Foley Sound Generation using Selective State-Space Models**, *2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*

[C18] Albarracín Sánchez, J. C., **Comanducci, L.**, Pezzoli, M. & Antonacci, F. (2024). **Towards HRTF Personalization using Denoising Diffusion Models**, *2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*

[C17] Ronchini, F., **Comanducci, L.**, & Antonacci, F. (2024). **Synthetic training set generation using text-to-audio models for environmental sound classification** , *2024 Detection and Classification of Acoustic Scenes and Events (DCASE) workshop, Tokyo, Japan*

[C16] **Comanducci, L.**[*], Antonacci, F., & Sarti, A. (2024). **Interpreting End-to-End Deep Learning Models for Speech Source Localization Using Layer-wise Relevance Propagation**, *2024 32nd European Signal Processing Conference (EUSIPCO)*

[C15] Ronchini, F., **Comanducci, L.**, Pezzoli, M., Antonacci, F., & Sarti, A. (2024). **Room Transfer Function Reconstruction Using Complex-valued Neural Networks and Irregularly Distributed Microphones**, *2024 32nd European Signal Processing Conference (EUSIPCO)*

[C14] Miotello, F., Ostan, P., Pezzoli, M., **Comanducci, L.**, Bernardini, A., Antonacci, F., & Sarti, A. (2024). **HOMULA-RIR: A Room Impulse Response Dataset for Teleconferencing and Spatial Audio Applications Acquired Through Higher-Order Microphones and Uniform Linear Microphone Arrays.** 2024 Hands-Free Speech Communications and Microphone Arrays (HSCMA). IEEE.

[C13] Miotello, F., **Comanducci, L.**, Pezzoli, M., Bernardini, A., Antonacci, F., & Sarti, A. (2024). **Reconstruction of Sound Field through Diffusion Models.** ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)

[C12] Zumerle, F., **Comanducci, L.**, Zanoni, M., Bernardini, A., Antonacci, F.& Sarti , A. **Procedural music generation for videogames conditioned through video emotion recognition**, accepted at 4th International Symposium on the Internet of Sound (IS^{2}2023), 2023.

[C11] 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 (IS^{2}2023), 2023.

[C10] Olivieri, M., Simeon, F. **Comanducci, L.**, Antonacci, F.& Sarti , A. **JumpApp: an online didactic game for music training and education**, accepted at 4th International Symposium on the Internet of Sound (IS^{2}2023), 2023.

[C9] **Comanducci, L.**, Antonacci, F.& Sarti , A. **Timbre transfer using image-to-image denoising diffusion implicit models**, 24th International Society for Music Information Retrieval Conference (ISMIR 2023), 2023.

[C8] Olivieri, M., **Comanducci, L.**, Pezzoli, M., Balsarri, D., Menescardi, L., Buccoli, M., Pecorino, S., Grosso, A., Antonacci, F.& Sarti , A. **Real-time multichannel speech separation and enhancement using a beamspace-domain-based lightweight CNN**, ICASSP 2023-2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)

[C7] **Comanducci, L.**, Antonacci, F., & Sarti, A. **A deep learning-based pressure matching approach to soundfield synthesis**. In 2022 International Workshop on Acoustic Signal Enhancement (IWAENC) (pp. 1-5). IEEE.

[C6] Borra, F., Pezzoli, M., **Comanducci, L.**, Bernardini, A., Antonacci, F., Tubaro, S., & Sarti, A. **A fast ray space transform for wave field processing using acoustic arrays**. In 2020 28th European Signal Processing Conference (EUSIPCO) (pp. 186-190). IEEE.

[C5] Battello, R., **Comanducci, L.**, Antonacci, F., Sarti, A., Delle Monache, S., Cospito, G., Pietrocola, E. & Berbenni, F. **An adaptive metronome technique for mitigating the impact of latency in networked music performances**. In 2020 27th Conference of Open Innovations Association (FRUCT) (pp. 10-17). IEEE. ISO 690

[C4] **Comanducci, L.**, Cobos, M., Antonacci, F., & Sarti, A. **Time difference of arrival estimation from frequency-sliding generalized cross-correlations using convolutional neural networks.** In ICASSP 2020-2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 4945-4949). IEEE. ISO 690

[C3] **Comanducci, L.**, Buccoli, M., Zanoni, M., Sarti, A., Delle Monache, S., Cospito, G., Pietrocola, E., & Berbenni, F. **Investigating networked music performances in pedagogical scenarios for the intermusic project**. In 2018 23rd Conference of Open Innovations Association (FRUCT) (pp. 119-127). IEEE.

[C2] Pezzoli, M., **Comanducci, L.**, Waltz, J., Agnello, A., Bondi, L., Canclini, A., & Sarti, A. **A dante powered modular microphone array system**. In 2018 Audio Engineering Society Convention 145. Audio Engineering Society.

[C1] **Comanducci, L.**, Borra, F., Bestagini, P., Antonacci, F., Sarti, A., & Tubaro, S. (2018, September). **Ray space transform interpolation with convolutional autoencoder**. In 2018 16th International Workshop on Acoustic Signal Enhancement (IWAENC) (pp. 261-265). IEEE.

NATIONAL CONFERENCES

[NC2] Delle Monache, S., Buccoli, M., **Comanducci, L.**, Sarti, A., Cospito, G., Pietrocola, E., & Berbenni, F. (2018, November). **Time is not on my side: network latency, presence and performance in remote music interaction**. In Proceedings of the XXII CIM Colloquium on Music Informatics-Machine Sounds, Sound Machines (pp. 152-158).

[NC1] Baldan, S., Delle Monache, S., & **Comanducci, L. His engine's voice: towards a vocal sketching tool for synthetic engine sounds**. In Proceedings of the XX Colloquium on Musical Informatics (CIM), 2014. Università IUAV di Venezia, Rome.

BOOK CHAPTERS

[B2] Delle Monache, S. **Comanducci, L.**, Cospito, G., Sarti, A., Avanzini, F. **Synchronous Online Ensemble Performance**, in *Music, Technology, Innovation: Industry and Educational Perspectives (2024)*, Routledge

[B1] **Comanducci, L.*** (2022). **Intelligent Networked Music Performance Experiences**, in *Special Topics in Information Technology* (pp. 119-130). Cham: Springer International Publishing.

UNDER REVIEW

[U1] Ronchini, F., Passoni, R., **Comanducci, L.**, Serizel, R. & Antonacci, F. **Analyzing the Energy Consumption of Generative Text-to-Music Models**, submitted to *IEEE Transactions on Technology and Society*

Participation in International Research Projects

REPERTORIUM (Researching and Encouraging the Promulgation of European Repertory through Technologies Operating on Records Interrelated Utilising Machines), Grant agreement number 101095065. Horizon Europe. Cluster II. Culture, Creativity and Inclusive Society. Call HORIZON-CL2-2022-HERITAGE-01-02.
My main efforts consist in the co-supervision of two Ph.D. students for the development of solutions for Sound field reconstruction using deep learning techniques [C13,U3]. I also participated in recording sessions for the creation of datasets made through the use of spatial microphones [C14].

INTERMUSIC (INTERactive environment for MUSIC learning and practising), Erasmus + KA2 2017-1-IT02-KA203-036770
(2018-2020) During the project I collaborated with several national and international partners (Conservatorio di Milano,

Lithuanian Academy of Music and Theatre, Royal Danish Academy of Music) to study the feasibility of an online platform for music teaching. Specifically, team efforts consisted in the study of the effect of network latency [NC2, C3, J1] and immersivity on musicians as well as the development of an adaptive metronome technique that could help the musicians [C5, J5].

SkAT-VG (Sketching Audio Technologies using Vocalizations and Gestures) European-funded project. Internship for development of bachelor thesis, helped in the developing of the project "His Engine's Voice", a synthesizer for car sound based on physical models and controlled by the use of the human voice. Internship done at IUAV University of Venice (May - July 2014) (1 publication [NC1])

Collaborations with the industry

SampleSound I analyzed the state-of-the-art for concerning generative modeling of music audio samples via textual descriptions. I trained from scratch the MUSICGEN deep learning model by META using data from the company and developing the necessary data pipeline. (2023-2024)

INVENTVM Modeling of Piezoelectric Loudspeakers using COMSOL Multiphysics, Role: Researcher. I simulated using COMSOL the behavior of a piezoelectric loudspeaker mounted on a smartphone in order to match measurements that I performed in the anechoic chamber of the Department of Engineering of the Politecnico di Milano. (Jan - Jul 2022)

BdSound Deep Learning Algorithms for sound source separation, Role: Researcher. The project entailed the development of deep learning solutions for speech source separation. My main role consisted in the implementation of the data pipeline, training procedure and network of the proposed learning model (1 joint publication [C8]). I also implemented from scratch a model already proposed in the literature used as baseline (2021-2022)

Google Research Zurich I collaborated with Prof. Marco Tagliasacchi working on understanding inner workings of Convolutional Neural Networks (CNNs) applied to audio. Specifically, by taking embeddings extracted from pre-trained CNNs and training custom decoders to reconstruct the input speech signals. (1 joint publication [J4]) (2020-2021)

Eventide Inc. "eSticks" project between Politecnico di Milano and Eventide Inc. I collaborated for the implementation of spatial audio algorithms used to test the modular microphone array eSticks. (1 joint publication [C2])

Esperienza Didattica

In corso (dal 2025)	**Signals and Systems Module 2**, Teaching Assistant (M.Sc. in Music and Acoustic Engineering), Prof. Alberto Bernardini (10 ore nel 2025)	*Politecnico di Milano*
In corso (dal 2019)	**Creative Programming and Computing - Module 2: Platforms, Interaction Devices and Interface**, Teaching Assistant (M.Sc. in Music and Acoustic Engineering), Prof. Massimiliano Zanoni (20 ore nel 2019, 2020, 2021, 2024; 25 ore nel 2022; 10 ore nel 2023)	*Politecnico di Milano*
In corso (dal 2023)	**Music and Acoustic Engineering Capstone**, Teaching Assistant (M.Sc. in Music and Acoustic Engineering), Prof. Alberto Bernardini (20 ore nel 2023, 15 ore nel 2024)	*Politecnico di Milano*
Primavera 2022	**Project Course**, Teaching Assistant (M.Sc. in Music and Acoustic Engineering), Prof. Alberto Bernardini (10 ore)	*Politecnico di Milano*
2019–2022	**Musical Acoustics - Module 1: Modeling of Musical Instruments**, Teaching Assistant (M.Sc. in Music and Acoustic Engineering), Prof. Fabio Antonacci (20 ore nel 2019; 10 ore nel 2020, 2021 e 2022)	*Politecnico di Milano*
2020–2022	**Musical Acoustics - Module 1: Modeling of Musical Instruments**, Tutor (M.Sc. in Music and Acoustic Engineering), Prof. Fabio Antonacci (10 ore nel 2020, 2021, 2022)	*Politecnico di Milano*
2018	**Fundamentals of Computer Science**, Teaching Assistant (B.Sc. in Computer Engineering and Management Engineering), Prof. Luciano Baresi (20 ore)	*Politecnico di Milano*

Supervision of Master Theses

2025-2026	**Flavio Ingenito**, *Explainability for text-to-music models.*, M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini, Paolo Bestagini	*Politecnico di Milano*
2025-2026	**Riccardo Moschen**, *Interfaces for live acousmatic Music*, M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini, Massimo Colombo	*Politecnico di Milano*
2024-2025	**Alice Portentoso**, *Music Machine Unlearning*, M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini	*Politecnico di Milano*
2024-2025	**Alice Lenoci**, *Towards Black-Box Membership Inference in Diffusion-Based Music Generative Models*, M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini, Paolo Bestagini	*Politecnico di Milano*
2024-2025	**Francisco Messina**, *Towards memorization free audio diffusion models*, M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini, Paolo Bestagini	*Politecnico di Milano*
2024-2025	**Sophia Barbera**, *Fake Music Detection*, M.Sc. Thesis in Computer Science and Engineering, co-advisor: Francesca Ronchini, Paolo Bestagini	*Politecnico di Milano*
2024-2025	**Antonino Fabio Coppola**, *Investigating the Task of Automated Audio Captioning: Enhancements through Data Augmentation and Multilingual Translation, co-advisor: Prof. Elsa Ferreira Gomes (ISEP - Instituto Superior de Engenharia do Porto)*	*Politecnico di Milano*
2024-2025	**Nicolò Pisanu**, *Detection of Underwater Bioacoustic Events in Spectrograms via Object Detection Models, (thesis pursued at GemmoAI)*	*Politecnico di Milano*
2024-2025	**Wenjia Luo**, *Interaction Design for live performance of acousmatic music (In collaboration with Fondazione Culturale San Fedele)* , M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini, Massimo Colombo, Antonio Pileggi, Giovanni Cospito (Fondazione Culturale San Fedele)	*Politecnico di Milano*
2023-2024	**Marco Furio Colombo**, *Mamba-Foley: Time-Controlled Foley Sound Generation using Selective State-Space Models*, M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini	*Politecnico di Milano*
2023-2024	**Simone Marcucci**, *Text-to-music models for creative music practice: a user experience study*, M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini	*Politecnico di Milano*
2023-2024	**Guglielmo Fratticioli**, *Timbre Transfer using selective state-space models*, M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini	*Politecnico di Milano*
2023-2024	**Federico Angelo Luigi Ferreri**, *Sound Event Detection and Localization using Mel-FSGCC* , M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini, Maximo Cobos	*Politecnico di Milano*
2023-2024	**Riccardo Passoni**, *Balance between performance end carbon footspring of state-of-the-art deep learning systems for audio domain applications*, M.Sc. Thesis in Music and Acoustic Engineering, co-advisor: Francesca Ronchini	*Politecnico di Milano*

Co-supervision of Master Theses

2022-2023	**Juan Camilo Albarracín Sánchez**, *Head-related transfer function generation using denoising diffusion probabilistic models*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Mirco Pezzoli.	*Politecnico di Milano*
2022-2023	**Gabriele Perego**, *Prompt Audio Generator User Research Investigation* , M.Sc. Thesis in Music and Acoustic Engineering, Francesca Ronchini, Prof. Massimiliano Zanoni.	*Politecnico di Milano*
2022-2023	**Gabriele Maucione**, *A study on the effect of dynamic accents on the perception and measurement of rhythm complexity.*, M.Sc. Thesis in Music and Acoustic Engineering, Co-advisor: Alessandro Ilic Mezza, Advisor: Prof. Augusto Sarti.	*Politecnico di Milano*
2022-2023	**Francesco Zumerle**, *Procedural Music Generation For Video games*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Massimiliano Zanoni.	*Politecnico di Milano*
2022-2023	**Roberto Alessandri**, *A deep learning-based method for multi-zone sound field synthesis*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Fabio Antonacci.	*Politecnico di Milano*
2021-2022	**Silvio Pol**, *Timbre Transfer and Interpolation Using a Conditional Convolutional beta-Variational Autoencoder*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Massimiliano Zanoni.	*Politecnico di Milano*
2021-2022	**Federico Miotello**, *A deep prior approach to inpainting of audio signals*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Fabio Antonacci, Co-advisor: Prof. Mirco Pezzoli.	*Politecnico di Milano*
2020-2021	**Davide Mori**, *Towards soundfield rendering with distributed loudspeaker arrays using convolutional neural networks applied to the ray space transform*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Fabio Antonacci.	*Politecnico di Milano*
2020-2021	**Davide Gioiosa**, *Modeling harmonic complexity in automatic music generation using conditional variational autoencoders*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Massimiliano Zanoni.	*Politecnico di Milano*
2019-2020	**Alessandro Montali**, *Interpreting deep neural networks models for acoustic source localization using layer-wise relevance propagation*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Fabio Antonacci.	*Politecnico di Milano*
2019-2020	**Matteo Manzolini**, *Cellular music : a novel music-generation platform based on an evolutionary paradigm*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Augusto Sarti, Co-advisor: Dr. Clara Borrelli.	*Politecnico di Milano*
2019-2020	**Minh Cédric Schils**, *Audio frame reconstruction from incomplete observations using Deep Learning techniques*, M.Sc. Thesis in Music and Acoustic Engineering, Advisors: Prof. Augusto Sarti, Prof. Jean-Jacques Embrechts.	*Politecnico di Milano*
2019-2020	**Riccardo Battello**, *Techniques for mitigating the impact of latency in networked music performance (NMP) through adaptive metronomes*, M.Sc. Thesis in Music and Acoustic Engineering, Advisor: Prof. Augusto Sarti.	*Politecnico di Milano*

Awards, Fellowships, & Grants

(2025) **Travel Grant** 624$ from IEEE Signal Processing Society (SPS) and SPS Student and Young Professionals (SYP) Fund to attend IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA).

(2022) **Springer Award for the Ph.D. thesis** Politecnico di Milano IT PhD Board of professors. My Ph.D. thesis was selected among the best ones of the IT Ph.D. program of the politecnico di Milano, to be published in a Polimi SpringerBriefs volume [B1].

(2020) **Young Rearcher Award** for the paper An Adaptive Metronome Technique for Mitigating the Impact of Latency in Networked Music Performances. Riccardo Battello, Luca Comanducci, Fabio Antonacci, Augusto Sarti, Stefano Delle Monache, Giovanni Cospito, Enrico Pietrocola, Filippo Berbenni. 1st International Workshop on the Internet of Sounds, 27th Conference of Open Innovations Association FRUCT

Conference and Workshop Talks

AC- 2024	**Artificial Creativity. Looking at the future of Digital Culture**, Oral Presentation: Crafting Music and Audio via textual descriptions: Exploring the Future Evolution of Music Production and Audio Content Generation	*Milan, IT*
XAI-SA 2024	**IEEE ICASSP Workshop on Explainable Machine Learning for Speech and Audio**, Poster Presentation: Interpreting End-to-End Deep Learning Models for Speech Source Localization Using Layer-wise Relevance Propagation.	*Seoul, KR*
ISMIR 2023	**24th conference of the International Society for Music Information Retrieval (ISMIR)**, Poster Presentation: Timbre transfer using image-to-image denoising diffusion implicit models.	*Milano, IT*
IS^2 2023	**4th International Symposium on the Internet of Sounds**, Oral Presentation: Procedural music generation for videogames conditioned through video emotion recognition.	*Pisa, IT*
IWAENC 2022	**17th International Workshop on Acoustic Signal Enhancement, 5-8 September 2022**, Poster Presentation: A deep learning-based pressure matching approach to soundfield synthesis.	*Bamberg, GE*
ICASSP 2022	**IEEE International Conference on Acoustics, Speech, and Signal Processing, 22-27 May 2022**, Poster Presentation: Reconstructing Speech from CNN embeddings	*Online*
IWIS 2020	**1st IEEE International Workshop on the Internet of Sounds**, Oral presentation: An adaptive metronome technique for mitigating the impact of latency in networked music performances, 7-8 September 2020.	*Online*
ICASSP 2020	**IEEE International Conference on Acoustics, Speech, and Signal Processing, 22-27 May 2022**, Poster presentation: Time difference of arrival estimation from frequency-sliding generalized cross-correlations using convolutional neural networks	*Online*
ISAI 2018	**IEEE FRUCT International Workshop on Semantic Audio and the Internet of Things, 14-15 November 2018**, Oral Presentation: Investigating networked music performances in pedagogical scenarios for the intermusic project	*Bologna, IT*

Invited Talks

16 July 2021	**Seminar**, Space-time Parametric approach to extended Audio Reality (SP-EAR) /Intelligent Networked Music Performance (with Dr. Mirco Pezzoli)	*Valencia, Spain*
26 June 2020	**Webinar**, Ideas, technologies and tools for an e-learning platform dedicated to music, as part of the INTERMUSIC Webinar	*online*
14 Dec 2024 - Dec 2023	**Seminar**, Music Complexity, with Dr. Alessandro Ilic Mezza, as part of the Computer Music - Representations and Models course of the M.Sc. in Music and Acoustic Engineering, Politecnico di Milano, held by Prof. Alberto Bernardini	*Milan, Italy*

Major External Research Collaborations

Prof. C. Rinaldi, (CNIT Consorzio Nazionale Inter-universitario per le Telecomunicazioni, L'Aquila, Italy). Research of novel solutions for immersive audio applications including networked music performances within RESTART – FUNMedia project. (1 submitted joint publication [J11])

Prof. Mark D'Inverno, (Goldsmiths, University of London) Co-supervision of two students for the development of an augmented musical instrument (harmonizer) for the jazz singer Maria Pia De Vito (1 joint publication [C11]).

Prof. Matthew Yee-King (Goldsmiths, University of London) Co-supervision of two students for the development of an augmented musical instrument (harmonizer) for the jazz singer Maria Pia De Vito (1 joint publication [C11]).

Dr. Eleonora Oreggia (Goldsmiths, University of London) Co-supervision of three students as part of the Music and Acoustic Engineering Capstone Course, organizing a workshop to test a digital musical instrument.

Prof. Maximo Cobos (ETSE Universitat de València Frequency-sliding Generalized Cross Correlation (FSGCC) for time-delay estimation (2 joint publications [J2, C4]) Research visit at ETSE Universitat de València of 2 weeks (july 2021).

Prof. Marco Tagliasacchi (Google Research Zurich) Inverting embedding representations obtained via CNN trained for audio classification (1 joint publication [J4])

Dr. Stefano Delle Monache (Delft University of Technology) Study of the effect of latency and immersivity in Networked Music Performance for the INTERMUSIC project (4 joint publications[J1,C5,C3,NC2])

Prof. Emeritus Giovanni Cospito (Conservatorio di Milano) Study of the effect of latency and immersivity in Networked Music Performance for the INTERMUSIC project (5 joint publications [J1,J5,C5,C3,NC2])

Prof. Romain Serizel (Université de Lorraine, CNRS, Inria, LORIA) Study of the energy consumption and carbon emission of text-to-audio generative models (help in supervision of the M.Sc. thesis of Riccardo Passoni)

Outreach & Professional Development

ORGANIZATION OF EVENTS

5-9 Nov 2023 **24th International Society for Music Information Retrieval Conference (ISMIR)**, Organizing Committee, Virtual Technology, Social Media and Website
Milan

REVIEWER FOR INTERNATIONAL JOURNALS

Eurasip Journal on Audio, Speech, and Music Processing
IEEE Signal Processing Letters - IEEE
Journal of Signal Processing Systems - Springer Nature
Journal of the Audio Engineering Society - AES
IEEE Communications Magazine
IEEE Open Journal of Signal Processing
IEEE/ACM Transactions on Audio, Speech and Language Processing

REVIEWER FOR INTERNATIONAL CONFERENCES

IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2021, 2022, 2024,2025
IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA) 2021, 2025
European Signal Processing Conference (EUSIPCO) 2022, 2023, 2024, 2025
Audio Mostly (2022, 2024)
Colloquio di Informatica Musicale (CIM, 2024)
NGMSE2024 (2024 IEEE Symposium on Computers and Communications (ISCC)
Detection and Classification of Acoustic Scenes and Events Workshop (DCASE) 2024, 2025
International Joint Conference on Neural Networks (IJCNN 2025)
Interspeech 2025
New Interfaces for Musical Expression (NIME) 2025
International Joint Conference on Neural Networks 2025
IEEE International Symposium on the Internet of Sounds 2024, 2025

PROFESSIONAL MEMBERSHIPS

IEEE Student Member 2020, 2021, 2022
IEEE Member 2024, 2025, 2026
IEEE Signal Processing Society 2020, 2021, 2022, 2024, 2025, 2026

OTHER ACADEMIC SERVICES

Mentor, Widening Inclusion in Music Information Retrieval (WiMIR) mentoring program 2024, 2025, 2026