Diego DI CARLO

Mobilite Doctorale Sorante 2019

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born in 1989, Italy

Scientific background and current research interest

Machine Learning

Bayesian modeling for supervised learning

- *Regression and classification*
- *Deep learning*
- *Latent variable models*
- *Non-negative matrix factorization*

Auditory Scene Analysis

Acoustic echoes identification for auditory scene analysis

- *Room impulse response and Acoustic Channel estimation and Simulators*
- *Room geometry reconstruction*
- *Machine listening*

Audio inverse problem

Audio signal processing

- *Sound source localization and Separation*
- *De-reverberation*
- *Convolutive and probabilistic mixing models*

On going projects and achievements

Personal projects

- *Winner of the Abbey Roads®Hackthon 2019*

PhD-related projects

On going projects

- *Sound Source Localization with Honda®*
- *Sound Source Separation with Dolby®*
- *Developer for the IEEE®'s SPCup19 Challenge*

Education and Training

October 2017 – today **Ph.D**, *Virtually-Supervised Approach for Auditory Scene Analysis*, INRIA, Rennes, France.
Auditory scene analysis, room impulse response, room geometry reconstruction, channel estimation, supervised learning, mixture models and regression.
Supervisors: Nancy Bertin and Antoine Deleforge.

2016 **Master in Sound and Music Computing**, *Erasmus exchange program*, Aalborg University (Copenhagen), Denmark.
Music information retrieval, spatial audio (WFS), physical modeling, VR/AR and NIME.

2014–2017 **Master degree in Computer Engineering**, University of Padova, Italy, grade 108/110.
Digital signal processing, information and probability theory, sound and music computing, computer science and architecture.
Thesis title: *Guassian Framework for Interference Reduction in Live Recordings.*

2008–2014 **Bachelor degree in Information Engineering**, *University of Padova*, grade 99/110.
Signal processing, computer science, information and probability theory, calculus, electronics and telecommunication.
Thesis title: *Sequential Feature Selection: Algorithms And Applications For Audio Information Retrieval*

2008–2010 **Classical Double Bass with German bow**, *Conservatory of Vicenza "Arrigo Pedrollo"*.

Work experience

2016–2017 **Research internship**, *Multispeech team - Inria*, Nancy, France.
Gaussian process applied to interference reduction in live recording and its Python implementation. Supervisor: Antoine Liutkus.

2014–2016 **R&D Engineer**, *Zamperla s.r.l*, Vicenza, Italy.
Virtual reality on amusements rides and PC-to-PLC communication. - `www.zamperla.com`.

Publications

2019 *Mirage: 2D Source Localization using Microphone Pair Augmentation with Echoes* , D. Di Carlo, A. Deleforge and N. Bertin. accepted in ICASSP - IEEE International Conference on Acoustics, Speech, and Signal Processing, 2019.

2018 *Evaluation of an open-source implementation of the SRP-PHAT algorithm within the 2018 LOCATA challenge.*, R. Lebarbenchon, E. Camberlein, D. Di Carlo, C. Gaultier, A. Deleforge and N. Bertin. IWAENC - International Workshop on Acoustic Signal Enhancement, 2018.

2018 *Interference reduction on full-length live recordings*, D. Di Carlo, A. Liutkus and K. Déguernel. ICASSP - IEEE International Conference on Acoustics, Speech, and Signal Processing, 2018.

2018 *Separake: Source Separation with a Little Help From Echoes*, R. Scheibler, D. Di Carlo, A. Deleforge and I. Dokmanic. ICASSP - IEEE International Conference on Acoustics, Speech, and Signal Processing, 2018.

2017 *Gaussian framework for interference reduction in live recordings*, D. Di Carlo, K. Déguernel and A. Liutkus.Audio Engineering Society (AES) conference on Semantic Audio, 2017.

2014 *Automatic music "listening" for automatic music performance: a grandpiano dynamics classifier*, D. Di Carlo and A. Rodà, proceeding of 1st international workshop on computer and robotic Systems for Automatic Music Performance, 2014.

Languages

Italian **Fluent**, *Native*.

English **Fluent**, *TOEFL iBT: 82*.

French **Basic knowledge**.

Computer skills and competences

Languages Python3, MatLab, Java, Android, PureData, Processing, C++, Arduino.

Scientific writing LaTeX, BibTeX, Overleaf.

IDE, Editor and Tools Jupyter Notebooks, Numpy, Pytorch, Matlab, Weka. Sublime, Atom, Vim, Unity, Visual Studio. Git (Github, GitLab).

OS and programs Linux, OAR cluster, Windows, Office suite, Prezi, Gimp.

DAW and Music Tools Ableton, Sonic Visualizer, Reaper, Audacity, Renoise.

Personal insterest

Music
- *Compose and performing electronic music with controller and audio device.*
- *Play bass and doublebass from age of 15.*
- *Several music projects of jazz, pop, hip hop, rock, death-black metal, grind-core, post, prog, dubstep, EDM and IDM.*

Computer
- *Linux configuration and customization.*
- *Playing MMORPG.*
- *Contributing to open-source code.*

Hobby
- *DIY footpedal effect.*
- *Technical, narrative and horrible books.*
- *Mountain, snowboarding and sunsets.*