

Arthur Paté | Associate professor at Junia/ISEN, IEMN UMR CNRS 8520

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<https://scholar.google.com/citations?user=xXzQznIAAAAJ>

Education

Université Pierre et Marie Curie <i>Ph.D., with honors</i> Acoustics	Paris, France 2014
Université Pierre et Marie Curie <i>M.Sc., with honors</i> Acoustics, Signal processing & Computer science applied to Music (ATIAM)	Paris, France 2011
Université Pierre et Marie Curie <i>B.Sc., with honors</i> Engineering Science	Paris, France 2009
Université Paris Sorbonne <i>B.A., with highest honors</i> Music and Musicology	Paris, France 2009
CNR <i>DEM (final diplom at French conservatories), with highest honors</i> Chamber music	Versailles, France 2007
ENMD <i>DEM</i> Chamber music	Bourges, France 2005
ENMD <i>DEM</i> Music theory	Bourges, France 2002

Research Experience

Junia/ISEN – IEMN <i>Associate professor</i> Research in multimodal perception (mostly sound and vibrotactile), auditory and vibratory display.	Lille, France 2017–ongoing
Lamont-Doherty Earth Observatory, Columbia University <i>Post-doctoral research scientist</i> Exploration of large data bases of seismic signal by means of auditory display and machine learning ; application to discriminating thermo-cracking, hydraulic fracturing, and frictional sliding in human-induced earthquakes	Palisades, NY, USA 2016–2017
d'Alembert Inst. & Philharmonie de Paris/Musée de la Musique <i>Post-doctoral fellow</i> Mechanical and perceptual characterization of the voicing process of harpsichords (geometry and material of the plectra)	Paris, France 2015–2016

Université de Cergy-Pontoise / MRTE Lab **Cergy, France**
Post-doctoral fellow 2014–2015
 Perceptual investigation of the influence of temporal aspects (slope, duration, fluctuations) of aircraft sound signatures on the unpleasantness ; signal processing and statistical analysis

d'Alembert Inst. & IStEP **Paris, France**
Research fellow 2014
 Sonification of seismic signals, perceptual tests, link with geological features and processes

Université Pierre et Marie Curie / d'Alembert Inst. **Paris, France**
Ph.D. candidate 2011–2014
 Dissertation's title: "Lutherie of the solid body electric guitar: mechanical and perceptual aspects". Mechanical and perceptual characterization of the influence of the mechanical string/structure coupling on the sound in the case of the electric guitar

McGill University **Montréal, Canada**
Visiting researcher 2013
 Team CAML of the Music Technology department (G. Scavone). 6-week-long measurement campaign at a big industrial electric guitar manufacturer's

d'Alembert Inst. **Paris, France**
Research intern 2011
 Dissertation's title: "Vibroacoustic and perceptive study of electric guitars". Study of the influence of the neck/body junction of electric guitars, both on the vibratory behaviour and on perception

Puce Muse **Rungis, France**
Research intern 2010
 Development of new synthesizers and sound games for the platform "Méta-Mallette" (Max-based software for the production and control of music synthesizers with general public devices, mainly for educational purposes)

Teaching Experience

Junia/ISEN – IEMN **Lille, France**
Associate professor 2017–ongoing
 Deputy Team Leader of the Acoustics Team (9 researchers, 6 Ph.D. students)
 Coordinator of the "Music & Tech" curriculum (≈ 30 students)
 Teaching at undergraduate and graduate level in acoustics, audio, computer music, physics, signal processing, as well as supervision of student projects (≈ 6 groups/25 students + a dozen individual projects per semester), and the organization of conferences by external speakers

Sorbonne Université **Paris, France**
Invited lecturer 2019, 2021
 2h seminar, introduction to research in acoustics, taught to students in the Acoustics curriculum at M.Sc. level

CNED (French center for remote learning) **Chasseneuil, France**
Examiner 2018
 Writing and correction of exams in Acoustics for 1st and 2nd-year students in Musicology

Computer Music Center, Columbia University **New York, USA**
Teaching assistant 2017
 Seminar given in the series "Music Math and Mind", main instructors: David Sulzer, Brad Garton

Marie Curie ITN project Waves **Marseille, France**
Invited lecturer 2017
 Short course (12h) "Sonification of wave(s) data", with B. Holtzman, covered topics: data sonification methods, sound synthesis, spatialization, visualization, design strategies for communication to the general public. Taught to junior and senior researchers in the fields of physics, acoustics, Earth science

Computer Music Center, Columbia University **New York, USA**
Teaching assistant 2016
 Class "Sonic and Visual Representation of Natural Data (in python)", main instructor: B. Holtzman. Covered topics: importing and handling scientific data, sonification, visualization, Python, basics of musical theory. Taught to M.Sc. and Ph.D. students in music, arts, Earth science, computer science, physics

Université Pierre et Marie Curie**Paris, France***Teaching assistant**2011–2014*

Seminars (64h) and practical work (144h) in acoustics, continuum mechanics, signal processing, Fourier/Laplace transform, scientific computing, room acoustics. Supervision of 6 student projects and 2 internships.

Private music lessons**Various locations***Music teacher**2007–2015*

Electric and classical guitar lessons, music theory, to a total of 11 students (children, teenagers, adults)

Awards

CMMR conference**Marseille***Best demo award, France**2019*

Spatialized sonification and visualization of several seismic phenomena, see publication [D6]

As supervisor or advisor**Internal award, Junia****Lille, France***Best student project**2021*

Supervised 5 students who developed a mobile app to simulate hearing and visual impairments

Challenge Handicap et technologie**Lille, France***Favorite student project**2018*

Supervised 2 students who developed a device that detects a melody and displays it with 12 vibrators

LDEO Research as Art competition, Category “Movie”**Palisades, NY, USA***Winner**2017*

Project by Ph.D. candidates Joshua Russell and Celia Eddy at Columbia University, visualization and sonification of the Earth's resonant modes

Grants and funding

“Staccato” project*Vibrotactile mediation for shared musical practice**2020–2024*

Funded by the French National Research Agency (ANR) – 722k€ – PI H. Genevois – I act as a local scientific leader in this collaborative project between 5 labs

“VITAMIN” project*Visual and tactile modifications of an instrument**2020–2021*

Funded by IRCICA – 9k€ – consortium of 2 labs

“TOTEM” project*Touch the music**2018–2020*

Project leader: Arthur Paté – Funded by the European Agency Interreg FWVL – 30k€ – consortium of 1 lab/1 concert venue/1 start-up,

Travel grant*2014*

participation in the WoodSciCraft symposium funded by European program COST

Travel grant*2013*

participation in the SMAC2013 conference funded by the French acoustical society (GSAM/SFA)

Doctoral grant*2011–2014*

Research grant from the French department of higher education and research

Scholarly associations

- French Acoustical Society (SFA):

- Member since 2011

- Elected member of the musical acoustics group (GSAM) 2021–2023

- Elected member of the Northern France group (SRGNO) 2018–2023, scientific leader of this group 2021–2023
- o “Sciences and Musicology” alumni (AASM) (association promoting this double-curriculum at Sorbonne Université)
 - Founding member
 - Elected member of the executive board 2009–2014

Scientific outreach and dissemination

Junia/ISEN

Open House

3 times yearly open house where I show various demos in the lab: sound spatialization, sonification, vibrating floor and devices, models of metamaterials. . .

Lille, France

2017–ongoing

Université Catholique de Lille

Open Lab Days

Demo of sonified and spatialized seismic signals

Lille, France

2019

Hayden Planetarium / American Museum of Natural History

Seismodome

Exhibition with sonification and spatialization of seismic signals (major earthquakes, free oscillations of the Earth, event catalog) for introducing the general public to seismology. See www.seismicsoundlab.org

New York, USA

2017

LDEO/Columbia University

Open House

Introduction to the basics of seismology using sounds: sound design, exhibition booth preparation, and oral presentation to the general public

Palisades, NY, USA

2016

laguitare.com

Broadcast

Web-broadcast about the Les Paul guitar for this French website: dissemination of the results of my Ph.D

website www.laguitare.com

2015

Université de Cergy-Pontoise

“Allez Savoir !” magazine

Interview about my research on aircraft noise

Cergy, France

2015

Languages

French: Native

English: Fluent *B2 level of the French universities (CLEF) in 2010, followed by various research stays in the USA*

German: Fluent *B2 level obtained in 2008 as I was an Erasmus student at the Universität Wien (Vienna, Austria)*

Others: I took 1 year of Dutch lessons, and 1 year of Serbo-Croatian lessons. Now learning French Sign Language. . .

Computer skills

Music: Pure Data, Max/MSP/Jitter, RTcmix, Lilypond, Finale, Audacity — basics of: Sox, Protools, Nuendo, Reaper

Acoustics and mechanics: LEA, Cast3m, Modan

OS: Linux (mostly), Windows and Mac OS (basics)

Scientific Computing: Python, Octave, Matlab, Stata, Tanagra, Statgraphics, Uniwin, R (basics)

Office: Latex, LibreOffice, MS Office, Inkscape

Others: HTML, C/C++ (basics)

Supervision of students

Ph.D. Theses.....

- o Paul Cambourian (2019–2022), co-supervision with J. Vasseur (Université de Lille, France)

- Quentin Consigny (2020–2023), co-supervision with J.-L. Le Carrou & H. Genevois (Sorbonne Université, Paris, France)

Research internships.....

10 students at M.Sc. or B.Sc. level supervised or co-supervised: Rémi Blandin (2013), Elsa Jauffret (2014), Gretta Ngotteni (2018), Manon Guillou (2018), Audrey Gréciet (2019), Salamata Baldé (2020), Valentin Moutin (2020), Boris Légal (2020), Oscar Gal (2021), Léa Kaczmarek (2021).

Reviewing activities

Journals and conferences.....

Journals: Journal of the Acoustical Society of America, Applied Sciences, Applied Acoustics, Noise Control Engineering Journal, IEEE transactions on Haptics, Noise Control Engineering Journal

Conferences: International Conference on Auditory Display (ICAD), International Workshop on Haptic and Audio Interface Design (HAID)

Theses.....

External reviewer for:

- 1 Ph.D. thesis (2019, McGill University)
- 1 MS.c. thesis (2021, McGill University)

Publications and talks

Books.....

[B1] (Accepted) *Sensory Experiences: Exploring meaning and the senses*. D. Dubois, C. Cance, M. Coler, A. Paté, C. Guastavino. Amsterdam (NL): John Benjamins Publishing.

Book chapters.....

[BC9] (In press) *Chapter 1 — The five senses and the cognitivist approach of perception*. D. Dubois, C. Cance, M. Coler, A. Paté. In **[B1]**.

[BC8] (In press) *Chapter 6 — Exploring and talking about music*. A. Paté, P. Gaillard. In **[B1]**.

[BC7] (In press) *Chapter 9 — From perception to sensory experiences: A paradigm shift?*, D. Dubois, C. Cance, M. Coler, A. Paté, C. Guastavino. In **[B1]**.

[BC6] (In press) *Chapter 10 — Questioning sensory experience*. D. Dubois, C. Cance, M. Coler, A. Paté, C. Guastavino. In **[B1]**.

[BC5] (In press) *Chapter 12 — From stimulations to stimuli construction and selection*. D. Dubois, C. Cance, A. Paté, M. Coler. In **[B1]**.

[BC4] (In press) *Chapter 13 — Procedures and outcomes*. D. Dubois, C. Cance, A. Paté. In **[B1]**.

[BC3] (In press) *Chapter 15 — The Free Sorting Task: Procedure and data analysis*. A. Paté, D. Dubois, C. Guastavino. In **[B1]**.

[BC2] (In press) *An acoustician's approach of the solid body electric guitar*. A. Paté, J.-L. Le Carrou, B. Fabre. In *Quand la guitare s'électrise – When the guitar goes electric*, P. Bruguière, P. Gonin, B. Navarret (Eds.). Paris (FR): Cité de la Musique.

[BC1] *FA-RE-MI (Faire parler les instruments de musique du patrimoine): Making Historical Musical Instruments Speak*. S. Vaiedelich, H. Boutin, A. Paté, A. Givois, B. Fabre, S. Le Conte, J.-L. Le Carrou. In *Wooden Musical Instruments – Different Forms of Knowledge / Book of End of WoodMusIck COST Action FP1302*, M. A. Pérez and E. Marconi (Eds). Pp. 325–341. Paris (FR): Cité de la Musique Publishing (2018)

Theses.....

[T2] Ph.D. Thesis: *Lutherie de la guitare électrique solid body : aspects mécaniques et perceptifs*. Supervision: J.-L. Le Carrou, B. Fabre. Jury: C. Guastavino, F. Gautier, É. Parizet, V. Doutaut, L. Gagliardini, V. Martin, J.-L. Le Carrou, B. Fabre (2014).

[T1] M.Sc. Thesis: *Étude vibroacoustique et perceptive de guitares électriques*. Supervision: J.-L. Le Carrou, B. Navarret, D. Dubois (2011).

Peer-reviewed articles.....

- [A14] (In revision) *Perception of sound changes induced by a phononic crystal*. N. Côté, A. Paté, C. Croëne, J. Vasseur, A.-C. Hladky-Hennion. *Journal of the Acoustical Society of America*.
- [A13] (In press) *Sonification and animation of multivariate data to illuminate dynamics of geyser eruptions*. A. Barth, L. Karlstrom, B. Holtzman, A. Paté, A. Nayak. *Computer Music Journal*.
- [A12] *Influence of the player on the dynamics of the electric guitar*. J.-L. Le Carrou, A. Paté, B. Chomette. *The Journal of the Acoustical Society of America* 146(5):3123–3130 (2019)
- [A11] *Machine learning reveals cyclic changes in seismic source spectra in Geysers geothermal field*. B. Holtzman, A. Paté, J. Paisley, F. Waldhauser, D. Repetto. *Science Advances* 2018–4:eaao2929 (2018)
- [A10] *On the perception of audified seismograms*. L. Boschi, L. Delcor, J.-L. Le Carrou, C. Fritz, A. Paté, B. Holtzman. *Seismological Research Letters* 88(5):1279–1289 (2017)
- [A9] *Perception of Harpsichord Plectra Voicing*. A. Paté, A. Givois, S. Le Conte, J.-L. Le Carrou, M. Castellengo, S. Vaiedelich. *Acta Acustica united with Acustica* 103(4):685–704 (2017)
- [A8] *Influence of plectrum shape and jack velocity on the sound of the harpsichord: an experimental study*. A. Paté, J.-L. Le Carrou, A. Givois, A. Roy. *The Journal of the Acoustical Society of America* 141(3):1523–1534 (2017)
- [A7] *Auditory display of seismic data: On the use of experts' categorizations and verbal descriptions as heuristics for geoscience*. A. Paté, L. Boschi, D. Dubois, J.-L. Le Carrou, B. Holtzman. *The Journal of the Acoustical Society of America* 141(3):2143–2162 (2017)
- [A6] *Perceived unpleasantness of aircraft flyover noise: influence of temporal parameters*. A. Paté, C. Lavandier, A. Minard, I. Le Griffon. *Acta Acustica united with Acustica* 103(1):34–47 (2017)
- [A5] *Categorization of seismic sources by auditory display: A blind test*. A. Paté, L. Boschi, J.-L. Le Carrou, B. Holtzman. *International journal of human-computer studies* 85:57–67 (2016)
- [A4] *Modal parameter variability in industrial electric guitar making: Manufacturing process, wood variability, and lutherie decisions*. A. Paté, J.-L. Le Carrou, B. Fabre. *Applied Acoustics* 96:118–131 (2015)
- [A3] *Evolution of the modal behaviour of nominally identical electric guitars during the making process*. A. Paté, J.-L. Le Carrou, F. Teissier, B. Fabre. *Acta Acustica united with Acustica* 101(3):567–580 (2015)
- [A2] *Influence of the electric guitar's fingerboard wood on guitarists' perception*. A. Paté, J.-L. Le Carrou, B. Navarret, D. Dubois, B. Fabre. *Acta Acustica united with Acustica* 101(2):347–359 (2015)
- [A1] *Predicting the decay time of solid body electric guitar tones*. A. Paté, J.-L. Le Carrou, B. Fabre. *The Journal of the Acoustical Society of America* 135(5):3045–3055 (2014)

Other articles.....

- [OA1] *Sonification pour l'exploration et l'analyse de données – Résultats récents et perspectives via l'exemple de la sismologie*. A. Paté, L. Boschi, L. Delcor, B. Holtzman, D. Dubois, J.-L. Le Carrou, C. Fritz. *Acoustique et Technique* 88 (2018)

Conferences with proceedings.....

- [C13] *Investigating the vocabulary used by electric guitar players to speak about touch*. P. Cambourian, A. Paté, C. Cance, B. Navarret, J. Vasseur. *Proceedings of Forum Acusticum, Lyon (FR)* (2020).
- [C12] *Human and Machine Listening of Seismic Data*. A. Paté, B. Holtzman, F. Waldhauser, D. Repetto, J. Paisley. *ICAD (International Conference on Auditory Display)*, Penn State University (USA) (2017)
- [C11] *Harpsichord voicing: The player's auditive and tactile perception*. A. Paté, A. Givois, J.-L. Le Carrou, S. Le Conte, S. Vaiedelich. *ISMRA (International Symposium on Musical and Room Acoustics)*, La Plata (AR) (2016)
- [C10] *Un dispositif de mesure des caractéristiques géométriques et mécaniques de becs de clavecin (A measurement apparatus for geometrical and mechanical characteristics of harpsichord plectra)*. Arthur Givois, Arthur Paté, J.-L. Le Carrou, Sandie Le Conte, Stéphane Vaiedelich. *Congrès français d'Acoustique (French Congress on Acoustics)*, Le Mans, France, pp. 1785-1791 (2016)
- [C9] *Influence of temporal aspects of aircraft sound signature on perceived unpleasantness*. A. Paté, C. Lavandier, A. Minard. *Internoise*, pp. 1805-1816 (2015)
- [C8] *Can auditory display help us categorize seismic signals?* L. Boschi, A. Paté, Ben Holtzman, J.-L. Le Carrou. *ICAD (International Conference on Auditory Display)*, Graz, Austria (2015)

- [C7] *Modal parameter variability in industrial electric guitar manufacturing*. A. Paté, J.-L. Le Carrou, B. Fabre. ISMA/USD (Uncertainty in Structural Dynamics), Leuven, Belgium (2014)
- [C6] *Influence of the instrumentalist on the electric guitar vibratory behaviour*. J.-L. Le Carrou, B. Chomette, A. Paté. ISMA (International Symposium on Musical Acoustics), Le Mans, France, pp. 413-417 (2014)
- [C5] *Monitoring of the making process of a handcrafted electric guitar*. A. Paté, J.-L. Le Carrou, F. Teissier, B. Fabre. ISMA (International Symposium on Musical Acoustics), Le Mans, France (2014)
- [C4] *Influence de la touche de la guitare électrique : analyses perceptive et vibratoire*. A. Paté, J.-L. Le Carrou, B. Navarret, D. Dubois, B. Fabre. Congrès français d'Acoustique (French Congress on Acoustics), Poitiers, France, pp. 1129-1134 (2014)
- [C3] *Ebony vs. rosewood: experimental investigation about the influence of the fingerboard on the sound of a solid body electric guitar*. A. Paté, J.-L. Le Carrou, B. Fabre. SMAC (Stockholm Musical Acoustics Conference), pp. 182-187 (2013)
- [C2] *A vibro-acoustical and perceptive study of the neck-to-body junction of a solid-body electric guitar*. A. Paté, J.-L. Le Carrou, B. Navarret, D. Dubois, B. Fabre. Acoustics, Nantes, France (2012)
- [C1] *About the electric guitar: a cross-disciplinary context for an acoustical study*. A. Paté, B. Navarret, R. Dumoulin, J.-L. Le Carrou, B. Fabre, V. Doutaut. Acoustics, Nantes, France (2012)

Conferences without proceedings.....

- [D7] *Pairing a beer with a soundtrack, guided by geographical identity?* M. Vandenberghe-Descamps, S. Baldé, A. Paté, S. Chollet. 9th European Conference on Sensory and Consumer Research (Eurosense), Rotterdam, the Netherlands (2020)
- [D6] *Spatialized seismic soundscapes: exploring seismic data in virtual reality*. A. Paté, B. Holtzman, L. Boschi, G. Farge, A. Barth, S. Cluett, M. Pratt, J. Candler, D. Repetto, L. Karlstrom, J. Crozier, P. Poli, K. Okamoto, J. Nelson. CMMR (Conference on Multidisciplinary Music Research), Marseille, France (2019)
- [Best Demo Award]
- [D5] *Bottom pressure record of resonant oscillations in the Sea of Marmara*. P. Henry, S. Özeren, N. Postacioğlu, C. Chevalier, N. Yakupoğlu, E. de Saint-Léger, O. Desprez de Gésincourt, Z. Çakir, M. Çağatay, A. Paté, L. Géli. EGU (European Geosciences Union) General Assembly, Vienna, Austria (2019)
- [D4] *Machine listening for earthquake source characterization: subtle spectral differences indicate changes in thermal-mechanical state in geothermal reservoirs*. B. Holtzman, F. Waldhauser, J. Paisley, A. Paté, P. Martínez-Garzón, G. Kwiatek, L. Boschi, N. van der Elst. AGU Fall Meeting, New Orleans, USA (2018)
- [D3] *Audio-based, unsupervised machine learning reveals cyclic changes in earthquake mechanisms in the Geysers geothermal field, California*. Ben Holtzman, Arthur Paté, John Paisley, Felix Waldhauser, Douglas Repetto, Lapo Boschi. AGU Fall Meeting, New Orleans, USA (2017)
- [D2] *SeismoDome: Sonic and visual representation of earthquakes and seismic waves in the planetarium*. B. Holtzman, J. Candler, D. Repetto, M. Pratt, A. Paté, M. Turk, L. Gualtieri, D. Peter, V. Trakinski, D. Ebel, J. Gossmann, N. Lem. AGU Fall Meeting, New Orleans, USA (2017)
- [D1] *Investigating multimodal perception during the musical performance: The case of harpsichord voicing*. A. Paté, A. Givois, J.-L. Le Carrou, M. Castellengo, S. Le Conte, S. Vaiedelich. Meetings of the Acoustical Society of America, Boston, USA (2017)

Oral communications and Posters.....

- [OP5] (oral) *Schaeffer and Schafer: When musiciens promote scientific hypotheses on auditory experience*. C. Guastavino, A. Paté, P. Gaillard. Uncommon Senses 2, Montreal, Canada (2018)
- [OP4] (oral) *Cyclic changes in micro-seismicity in the Geysers geothermal field, as revealed by Machine Listening*. B. Holtzman, A. Paté, J. Paisley, F. Waldhauser, D. Repetto. Lamont Data Science Symposium, Palisades, USA (2017)
- [OP3] (poster) *Ebony & rosewood electric guitar fingerboards: do they really sound different?* A. Paté, J.-L. Le Carrou, B. Fabre. SMAC (Stockholm Musical Acoustics Conference) (2013)
- [OP2] (poster) *Symmetrical vs. asymmetrical electric guitar: what change for sound?* A. Paté, JJCAAS, Rennes, France (2012)
- [OP1] (poster) *Étude vibratoire et perceptive de guitares électriques*. A. Paté, JJCAAS, Rennes, France

(2011)

Invited talks and seminars.....

- Invited talk for the training of graduate students in the Marie Curie ITN project MultiTouch (PI Frédéric Giraud, L2EP and Polytech Lille, Lille, France) (2020)
- Invited talk for the Open Lab Days at Université Catholique de Lille (2019)
- Internal seminars at LIB/Sorbonne (2018), LDEO-SGT/Columbia (2017), Laboratoire de Géologie/ENS (2016), UME/ENSTA (2015), ISTeP/UPMC (2015), /INSA-Lyon (2015)

Others

About my work, in the media (I am not the author!!).....

- *Forskning: Tonetræs betydning er overvurderet*. Andreas Staarup Madsen. Apache - magasinet for danske guitarister (June 2018)
- *Neck Joints, Science, and Sound Opinions*. Heiko Hoepfinger. Premier Guitar, pp. 112–114 (May 2017)

Interests and hobbies

Music Electric guitar in various bands: progressive rock, jazz, metal, post-rock, folk
Experimental and improvised electro-acoustical music with my guitar and its effects, as well as my Pure-Data-loaded computer

Voluntary work Former member of the cooperative supermarkets la Louve (Paris, France) and Park Slope Food Coop (New York, USA), now involved in Lille with the project SuperQuinquin, where I am an elected member of the board responsible for general assemblies.

Active in the French “CIGALES” network (fundraising citizen association for social and solidarity economy, financing alternative projects with strong emphasis on the social, ecological and local aspects, that are excluded from the more traditional funding systems): member and treasurer of one in Paris, member of another one in Lille ; I’ve been involved with the regional coordination on the selection of projects and the management of internal training programs in Paris.

I am also involved in the project “9 Millions” (www.9milliards.com), a platform aiming at empowering citizens for developing open and ethical information media

Others Hiking, biking, reading, movies