Clément Gaultier

Postdoctoral Research Fellow, MRC Cognition and Brain Sciences Unit, University of Cambridge

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scholar: Clément Gaultier
31 years old, driving license

Research Positions

Dec. 2021 – current **Postdoctoral Research Fellow**, *MRC Cognition and Brain Sciences Unit*, Cambridge, UK, *Research.*

- Project: Speech Enhancement for people with cochlear implants, Fondation Pour l'Audition Fellowship
  - Deep Hearing Lab: Dr. Tobias Goehring,
  - multi-microphone signal processing,
  - deep learning,
  - auditory science, speech perception,
  - virtual acoustics.

Sept. 2019 – Feb. 2021 **Postdoctoral researcher**, *Orange, Orange Labs*, Cesson-Sévigné, FRANCE, *Research & Development.*

- Project: Multichannel acoustic echo cancellation for ad-hoc distributed audio systems
  - low-latency Acoustic Echo Cancellation (AEC),
  - Room Impulse Responses measurements,
  - speaker localization through multilateration,
  - patent pending on real-time acoustic echo cancellation robust to acoustic path change and double-talk scenario.

Feb. 2019 – Aug. 2019 **Research Engineer**, *Inria Rennes research center*, Rennes, FRANCE, *Research & Development.*

- Projects: audio restoration transfer of technology
  - pop noise removal,
  - multichannel declipping,
  - DSP algorithms code conversion,
  - listening tests.

Nov. 2015 – Jan. 2019 **Ph.D. candidate specialized in acoustic & audio signal processing**, *Inria Rennes research center*, Rennes, FRANCE, *Research.*

- Early stage researcher
- Projects: acoustic & audio signal processing inverse problems
  - digital sound processing,
  - non-convex optimization algorithms,
  - machine learning for binaural sound source localization,
  - science popularization.
- Teaching, mentoring & evaluation
  - Teaching wave propagation physics tutorials - acoustics, electromagnetics, optics - for second year students (INSA Rennes public school of engineering delivering a postgraduate degree in engineering),
  - Mentoring undergrads students on a room acoustics project,
  - Jury member for final year students graduating as sound engineers from ESRA Bretagne school.

March 2015 – Sept. 2015 **Postgraduate visiting student**, *Institute of Sound and Vibration Research*, Southampton, UK, University of Southampton.

Measuring the adaptation to noise for enhanced speech perception in individuals with normal hearing

- Under the supervision of Dr. Jessica J. M. Monaghan and Prof. Stefan Bleeck
- Research work on the auditory system, hearing in noise, speech intelligibility, signal processing
- Setting up listening experiments for people with normal hearing
  - noisy speech stimuli calibration,
  - ethical study / noise exposure validation,
  - statistical analysis,
  - participants recruitment.

Education

Nov. 2015 – Jan. 2019 **Ph.D. specialized in acoustic & audio signal processing**, *Université de Rennes 1*, Rennes, FRANCE, *Research.*
Design and evaluation of sparse models and algorithms for audio inverse problems
- Under the supervision of Dr. Nancy Bertin & Prof. Rémi Gribonval
- Graduated in: January 2019
- Projects: acoustic & audio signal processing inverse problems
  - denoising, declipping, dereverberation,
  - structured (co)sparsity for time-frequency modeling,
  - non-convex optimization algorithms,
  - virtually supervised learning for binaural sound source localization,
  - multichannel real-time audio reconstruction.

2014 – 2015 **Master 2 Acoustics**, *Le Mans Université*, Le Mans, FRANCE, *Research, with Honours.*
- A University Master of Science under the authority of the French Ministry of Education and Research
- Graduated in: October 2015
- Specialized in: acoustics
- Project: Characterization of inhomogeneous membranes vibrations (psychoacoustic descriptors, spectrum analysis, vibration behaviour)

2012 – 2015 **Acoustics and vibrations graduate engineer**, *ENSIM - École Nationale d'Ingénieurs du Mans*, Le Mans, *Spécialité Acoustique - Vibration - Capteurs.*
- A selective Engineering School in three years under the authority of the French Ministry of Education and Research delivering a postgraduate degree in engineering
- Graduated in: October 2015
- Specialized in: vibration, acoustics, sensors
- Projects: With ONERA the French Aerospace Lab (acoustic measurements, signal processing, BEM modelling, correlation techniques)

Grants & Awards

March 18th, 2021 **FPA Research Fellowship**, *Fondation pour L'Audition*, 13, rue Moreau, Paris.
- "RECOVER-CI: REverberation COmpensation using Virtual acoustics and multichannel speech Enhancement to Restore speech perception in noise with Cochlear Implants"
  - Research fellowship starting 08-12-2021 (24 months, University of Cambridge, UK),
  - Award amount: € 118 126

June 28th, 2019 **Best flash presentation and poster**, *JJCAAS, Journées Jeunes Chercheurs en Audition, Acoustique musicale et Signal Audio*, Le Mans, Laboratoire d'Acoustique de l'Université du Mans.
- "Désaturation audio multicanale : une approche par coparcimonie structurée"
  - Multichannel Audio Declipping : a structured cosparse approach,
  - French Young Researcher Days on Hearing, Musical Acoustics and Audio Signal Processing

March 2015 **Erasmus+ Grant**.
- European Union Mobility Grant accorded for a postgraduate visiting student stay at Institute of Sound and Vibration Research, Southampton, UK

March 2015 **Envoleo Grant**, *Région Pays de la Loire*, France.
- Regional Council Mobility Grant accorded for a postgraduate visiting student stay at Institute of Sound and Vibration Research, Southampton, UK

Other Scientific Activities

2017 – present **Occasional Reviewer**.
- International Journals
  - IEEE Journal of Selected Topics in Signal Processing,
  - IEEE Transactions on Audio, Speech, and Language Processing,
  - Elsevier Signal Processing,
- International Conferences
  - IEEE International Conference on Acoustics, Speech, and Signal Processing,
  - International Conference on Latent Variable Analysis and Signal Separation.

2016 – 2019 **Scientific Outreach**.

- Journée Science et Musique
  - Member of the organizing committee,
  - Financial manager, communication manager,
  - JSM (Journée Science et Musique) is a science popularization open day about science and music organized every year by the PANAMA team (IRISA research center, Rennes (France)),
  - More than 650 attendees.

Teaching & Mentoring

Oct. 2018 – June 2020 **Teaching wave propagation physics**, *INSA Rennes*, Rennes, France.

- Teaching wave propagation physics tutorials - acoustics, electromagnetics, optics - for second year students (INSA Rennes public school of engineering delivering a postgraduate degree in engineering)

June 2019 **Jury Member**, *ESRA Bretagne*, Rennes, France.

- Jury member for final year students graduating as sound engineers from ESRA Bretagne school,
- Report reviewer and defence jury.

Jan. 2016 – July 2016 **Mentoring undergraduate students**, *Lycée Joliot-Curie*, Rennes, France.

- Room acoustics project, modal theory modeling, reverberation, practical validation and measurements,
- Undergraduate students in preparatory class studying intensive math, physics and engineering before French schools of Engineering competitive exams

Publications & Scientific Communications

International Peer Reviewed Articles

C. Gaultier, A. Guérin, G. Pallone, and M. Emerit, "Double-talk robust acoustic echo cancellation using partition block frequency-domain adaptive filtering," in *29th European Signal Processing Conference (EUSIPCO)*. IEEE, 2021, pp. 171–175.

C. Gaultier, S. Kitić, R. Gribonval, and N. Bertin, "Sparsity-based audio declipping methods: selected overview, new algorithms, and large-scale evaluation," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 29, pp. 1174–1187, 2021.

S. Kitić, **C. Gaultier**, and G. Pallone, "A comparative study of multilateration methods for single-source localization in distributed audio," in *Conference of Open Innovations Association, FRUCT*, no. 27. FRUCT Oy, 2020, pp. 328–336.

R. Lebarbenchon, E. Camberlein, D. Di Carlo, **C. Gaultier**, A. Deleforge, and N. Bertin, "Evaluation of an open-source implementation of the SRP-PHAT algorithm within the 2018 locata challenge," in *2018 16th International Workshop on Acoustic Signal Enhancement (IWAENC), LOCATA Challenge*. IEEE, 2018.

C. Gaultier, N. Bertin, and R. Gribonval, "CASCADE: Channel-Aware Structured Cosparse Audio DEclipper," in *2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2018, pp. 571–575.

C. Gaultier, S. Kitić, N. Bertin, and R. Gribonval, "AUDASCITY: AUdio Denoising by Adaptive Social CosparsITY," in *2017 25th European Signal Processing Conference (EUSIPCO)*. IEEE, 2017, pp. 1265–1269.

C. Gaultier, S. Kataria, and A. Deleforge, "VAST: The Virtual Acoustic Space Traveler dataset," in *International Conference on Latent Variable Analysis and Signal Separation*. Springer, 2017, pp. 68–79.

S. Kataria, **C. Gaultier**, and A. Deleforge, "Hearing in a shoe-box: binaural source position and wall absorption estimation using virtually supervised learning," in *2017 IEEE International Conference on Acoustics, Speech and Signal Processing*. IEEE, 2017, pp. 226–230.

Workshops with Selecting Committee

C. Gaultier, N. Bertin, and R. Gribonval, "Désaturation audio multicanale : une approche par coparcimonie structurée," in *JJCAAS, Journées Jeunes Chercheurs en Audition, Acoustique musicale et Signal audio*, 2019.

C. Gaultier, N. Bertin, and R. Gribonval, "Multichannel cosparse declipping: Stucture helps," in *GDR MIA, Journée Thématique "Parcimonie et Applications"*, 2018.

C. Gaultier, S. Kitić, N. Bertin, and R. Gribonval, "Cosparse denoising: The importance of being social," in *The Signal Processing with Adaptive Sparse Structured Representations (SPARS) workshop*, 2017.

R. Gokula, **C. Gaultier**, J. J. M. Monaghan, and S. Bleeck, "Acclimatization to different english accents for enhanced speech intelligibility in noise in individuals with normal hearing," in *Basic Auditory Science Meeting*. British Society of Audiology, 2015.

Talks

C. Gaultier, "Double-talk robust acoustic echo cancellation using partition block frequency-domain adaptive filtering," in *29th European Signal Processing Conference (EUSIPCO)*, August, 26 2021.

C. Gaultier, "A double-talk robust frequency-domain acoustic echo cancellation algorithm," in *Orange Labs Seminar, Rennes*, February, 9 2021.

C. Gaultier, "Design and evaluation of sparse models and algorithms for audio inverse problems," in *Orange Labs Seminar, Rennes*, October, 10 2019.

C. Gaultier, "Désaturation audio multicanale : une approche par coparcimonie structurée," in *JJCAAS, Journées Jeunes Chercheurs en Audition, Acoustique musicale et Signal audio*, June, 27 2019.

C. Gaultier, "Multichannel cosparse declipping: Stucture helps," in *GDR MIA, Journée Thématique "Parcimonie et Applications"*, May, 03 2018.

C. Gaultier, "Cosparse denoising: The importance of being social," in *The Signal Processing with Adaptive Sparse Structured Representations (SPARS) workshop*, June, 05 2017.

C. Gaultier, "VAST: The Virtual Acoustic Space Traveler dataset," in *International Conference on Latent Variable Analysis and Signal Separation*, February, 21 2017.