

# Marc Vidal

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## Publications

- 2023 **Vidal, M.**, Onderdijk, K. E., Aguilera, A. M., Six, J., Maes, P.-J., Fritz, T. H., Leman, M. Cholinergic-related pupil activity reflects level of emotionality during motor performance. *European Journal of Neuroscience*, 59(9):2193–2207. DOI: [10.1111/ejn.15998](https://doi.org/10.1111/ejn.15998)
- **Vidal, M.**, Aguilera, A. M. pfica: Independent components analysis techniques for functional data. R Foundation for Statistical Computing. Package Version 0.1.3.
  - Moura, N., **Vidal, M.**, Aguilera, A. M., Vilas-Boas, J.P., Serra, S., Leman, M. Knee flexion of saxophone players anticipates tonal context of music. *npj Science of Learning*, 8(22). DOI: [10.1038/s41539-023-00172-z](https://doi.org/10.1038/s41539-023-00172-z)
- 2022 **Vidal, M.**, Aguilera, A. M. Novel whitening approaches in functional settings. *Stat*, 12(1):e516. DOI: [10.1002/sta4.516](https://doi.org/10.1002/sta4.516)
- 2021 **Vidal, M.**, Rosso, M., Aguilera, A. M. Bi-smoothed functional independent component analysis for EEG artifact removal. *Mathematics*, 9(11):1243. DOI: [10.3390/math9111243](https://doi.org/10.3390/math9111243)

### Working papers

- 2024 **Vidal, M.**, Moura, N., Aguilera, A. M., Fritz, T. H., Leman, M. Geometric-based turbulence analysis of EEG signals for modeling emotional arousal during singing performance in virtual environments.
- **Vidal, M.**, Leman, M., Aguilera, A. M. Functional independent component analysis by choice of norm: a framework for near-perfect classification.
  - **Vidal, M.**, Aguilera, A. M. Wavelet thresholding on independent subspace factorizations of spatially indexed wide functional data for robust estimation of cortical activity.

## Conferences

- 2025 **Vidal, M.**, Aguilera, A.M. Multivariate functional independent component analysis for modelling turbulent flows on the cortical field. In: [Advanced models in functional data analysis for brain function](#). Presented at the 65th ISI World Statistics Congress, The Hague, Netherlands. [Organized session - Invited talk]
- 2024 **Vidal, M.**, Aguilera, A.M. Some properties of ICA in infinite-dimensional settings. 18th Conference International Joint Conference on Computational and Financial Econometrics (CFE) and Computational and Methodological Statistics (CMStatistics). King's College London, London. [Invited talk]
- **Vidal, M.** On the underlying principles of functional classification problems. The 31<sup>st</sup> Annual Meeting of the Royal Statistical Society of Belgium. Ghent University, Ghent, Belgium. [Contributed talk]
  - **Vidal, M.** [Functional data analysis for complex neuroscientific data](#). Presented at the Institute of Mathematics, University of Granada, Granada, Spain. [Invited talk]
  - **Vidal, M.**, Aguilera, A.M. Wavelet spatial ICA for wide functional data. Presented at the II Joint Workshop on Functional Data Analysis and Nonparametric Statistics, Universidad Autónoma de Madrid, Miraflores de la Sierra, Spain. [Contributed talk]
  - **Vidal, M.**, Leman, M., Aguilera, A.M. Classification of neuroscientific data under the probabilistic principles of near-perfect classification. 18th Conference of the International Federation of Classification Societies, University of Costa Rica, San José, Costa Rica. [Invited talk]
  - **Vidal, M.** [Mathematical modelling of brain arousal systems using functional data approaches based on ICA](#). Presented at the Patricia Román conference series in statistics and data science, Institute of Mathematics and Department of Statistics and O.R., University of Granada, Granada, Spain. [Invited talk]
  - **Vidal, M.**, Aguilera, A.M. Multivariate functional ICA for spatially indexed data. Presented at the fda-lille: Functional Data Analysis Workshop, Centre Inria of Lille University, Lille, France. [Invited talk]
- 2023 **Vidal, M.**, Aguilera, A.M. Wavelet-based sparse optimization via fixed-point iteration scheme in high-dimensional data analysis. Presented at the 21st IMACS World Congress, University “La Sapienza”, Rome, Italy. [Invited talk]
- **Vidal, M.**, Aguilera, A. M. Smoothed functional principal/independent components: computational and theoretical considerations. Presented at the 64th ISI World Statistics Congress, Ottawa, Canada. [Contributed talk]
  - **Vidal, M.**, Aguilera, A. M. Some properties of whitening transformations in function spaces. Presented at the 40th Annual Congress of the Spanish Statistical Society, University Miguel Hernández, Elche, Spain. [Invited talk]
- 2022 **Vidal, M.**, Onderdijk, K. E., Aguilera, A. M., Six, J., Maes, P.-J., Fritz, T., Leman, M. Measuring arousal with pupil dilation during experience of musical agency. Presented at the 2nd Conference on Music & Eye-Tracking, Max Planck Institute for Empirical Aesthetics, Frankfurt, Germany. [Contributed talk]
- **Vidal, M.**, Aguilera, A. M. On the independent components model for functional data. Presented at the 39th Annual Congress of the Spanish Statistical Society, Institute of Mathematics, Granada, Spain. [Contributed talk]
- 2021 **Vidal, M.**, Leman, M., Aguilera, A. M., Fritz, T. Neuromodulatory effects of movement during auditory-motor tasks. Presented at the 17th Annual Neuromusic VConference, McMaster University, Hamilton, Canada. [Contributed poster]

- **Vidal, M.**, Aguilera, A. M., Leman, M., Vindas, J. Estimation process in Hilbertian independent component analysis models. Presented at the 28th Annual meeting of the Royal Statistical Society of Belgium, University of Liège, Liège, Belgium. [Contributed poster]
- **Vidal, M.**, Aguilera, A. M. Independent component analysis techniques for functional data. Presented at the 5th International Workshop on Functional and Operatorial Statistics, Brno, Czech Republic. [Contributed poster]

## Education

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2020–2024	Joint PhD in Art Science and Mathematical and Applied Statistics (CUM LAUDE) ~ Ghent & Granada Universities <b>Thesis:</b> Hilbertian statistical models in music neuroscience Advisors: Prof. A. M. Aguilera, Prof. M. Leman and Prof. T. H. Fritz
2018–2020	MSc in Mathematical and Applied Statistics (hons, first-class) ~ University of Granada
2004–2010	B. and MEd. in Music ~ Catalonia College of Music
2000–2004	Technical studies (major in mathematics and physics) ~ laSalle Barcelona

## Teaching experience

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Nov 2023	– <b>Lecturer for a course in functional statistics</b> , Ghent University, Ghent, Belgium. Lecture contents: probability principles, curve approximation (Fourier, B-spline, Wavelets), functional PCA and inference with functional data.
2013–2020	– <b>Tenured lecturer</b> , Conservatory of Music, Granollers, Spain. Subjects: music theory, piano. Coordination of the Music Theory Department

## Merits

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2024	<b>Postdoctoral fellowship "María de Maetzu"</b> . Institute of Mathematics, University of Granada.
2024	<b>Faculty travel Grant</b> , Ghent University
2024	<b>Invited research contract</b> . Max Planck Institute for Human Cognitive and Brain Sciences.
2023	<b>Doctoral schools fellowship</b> , Ghent University and Flemish Government.
2022	<b>Invited research contract</b> . Max Planck Institute for Human Cognitive and Brain Sciences.
2020	<b>PhD Fellowship</b> in Art Science Research, Ghent University and Flemish Government.
2019	International <b>Master Studies Scholarship</b> , University of Granada, Erasmus+.
2016	<b>First Prize</b> at "Frederic Mompou" International Composition Award.

## Service to profession

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<b>As a reviewer</b>	Applied Sciences, Biosensors, Brain Sciences, Communications in Statistics, European Journal of Neuroscience, Musicae Scientiae, Sensors
<b>As associate editor</b>	Musicae Scientiae (since 2022, SAGE Q1 IF: 2.4)
<b>Event organization</b>	<ul style="list-style-type: none"> <li>– Symposium "Music interactions and advanced statistical models", Ghent University (main organizer).</li> <li>– Workshop "Functional data analysis and applications in digital and augmented humanities", Ghent University (main organizer). Invited researchers: J. Beran, A. Caponera, I. Daubechies and A. Menafoglio.</li> <li>– 39th Annual Congress of the Spanish Statistical Society (organizing committee member).</li> </ul>

## Skills

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<b>Languages</b>	Spanish (native), Catalan (native), English (C2, certificate date: 06-2019, place: UGR)
<b>Operating systems</b>	macOS, Linux
<b>Programming languages</b>	R, Python, LATEX, C/C++, HTML, Matlab