

# Marc Vidal

Dep of Data Analysis, Ghent University.

Dep of Neurology, Max Planck Institute for Human Cognitive and Brain Sciences

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[Github](#) [ORCID](#) [Scopus](#) [Math Genealogy](#)

## Academic positions

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2024–Pres	<b>Research Associate (Postdoc)</b> Dep of Data Analysis, Ghent University
2022–Pres	<b>Guest Researcher</b> Research Group Music Evoked Brain Plasticity, Dep of Neurology Max Planck Institute for Human Cognitive and Brain Sciences
2020–2024	<b>PhD Fellow</b> IPEM Institute, Ghent University Dep of Statistics and Institute of Mathematics, University of Granada

## Publications

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| 2025 | <b>Vidal, M.</b> A family of moment operators for functional data and its discriminative properties. Accepted in: Aneiros, G., Bongiorno, E., Goia, A., Hušková, M. (eds) <i>Functional Statistics and Related Fields, IWFO25, Contributions to Statistics</i> , Springer, Cham.  |
| –    | <b>Vidal, M.</b> , Leman, M., Aguilera, A. M. Functional independent component analysis by choice of norm: a framework for near-perfect classification. <i>Advances in Data Analysis and Classification</i> . DOI: <a href="https://doi.org/10.1007/s11634-024-00622-5">10.1007/s11634-024-00622-5</a>  |
| –    | <b>Vidal, M.</b> , Aguilera, A. M. Wavelet thresholding on independent subspace factorizations of spatially indexed wide functional data for robust estimation of cortical activity. <i>Mathematics and Computers in Simulation</i> , 232:346-361. DOI: <a href="https://doi.org/10.1016/j.matcom.2025.01.012">10.1016/j.matcom.2025.01.012</a> |
| 2023 | <b>Vidal, M.</b> , 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. <i>European Journal of Neuroscience</i> , 59(9):2193–2207. DOI: <a href="https://doi.org/10.1111/ejn.15998">10.1111/ejn.15998</a>               |
| –    | <b>Vidal, M.</b> , Aguilera, A. M. pfica: Independent components analysis techniques for functional data. R Foundation for Statistical Computing. Package Version 0.1.3.  |
| –    | Moura, N., <b>Vidal, M.</b> , Aguilera, A. M., Vilas-Boas, J.P., Serra, S., Leman, M. Knee flexion of saxophone players anticipates tonal context of music. <i>npj Science of Learning</i> , 8(22). DOI: <a href="https://doi.org/10.1038/s41539-023-00172-z">10.1038/s41539-023-00172-z</a>  |
| 2022 | <b>Vidal, M.</b> , Aguilera, A. M. Novel whitening approaches in functional settings. <i>Stat</i> , 12(1):e516. DOI: <a href="https://doi.org/10.1002/sta4.516">10.1002/sta4.516</a><br><i>Erratum: follow <a href="#">this link</a>.</i>   |
| 2021 | <b>Vidal, M.</b> , Rosso, M., Aguilera, A. M. Bi-smoothed functional independent component analysis for EEG artifact removal. <i>Mathematics</i> , 9(11):1243. DOI: <a href="https://doi.org/10.3390/math9111243">10.3390/math9111243</a> <i>Updated version: follow <a href="#">this link</a>.</i>   |

### Working papers

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| 2025 | <b>Vidal, M.</b> , Moura, N., Aguilera, A. M., Fritz, T. H., Leman, M. <i>Modeling emotional arousal with turbulence measured by EEG</i> . |
| –    | Rosseel, Y., <b>Vidal, M.</b> A tutorial for understanding SEM using R: Where do all the numbers come from?                                |

## Conferences

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| 2025 | <b>Vidal, M.</b> , Aguilera, A.M. Multivariate functional independent component analysis for modelling turbulent flows on the cortical field. In: <a href="#">Advanced models in functional data analysis for brain function</a> . Presented at the 65th ISI World Statistics Congress, The Hague, Netherlands. [Organized session - Invited talk] |
| –    | <b>Vidal, M.</b> , Rosseel, Y. Towards a structural after measurement model for functional data. Presented at the 2025 Meeting of the Structural Equation Modeling. University of Technology Chemnitz, Chemnitz, Germany. [Contributed talk]   |
| 2024 | <b>Vidal, M.</b> , 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]  |
| –    | <b>Vidal, M.</b> 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]   |
| –    | <b>Vidal, M.</b> <a href="#">Functional data analysis for complex neuroscientific data</a> . Presented at the Institute of Mathematics, University of Granada, Granada, Spain. [Invited talk]  |
| –    | <b>Vidal, M.</b> , 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

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

Jan 2025	– <b>Dimensionality reduction methods</b> , Flames course, Ghent University, Ghent, Belgium.
Nov 2023	– <b>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

2024	<b>Postdoctoral fellowship "María de Maetzu"</b> . Institute of Mathematics, University of Granada.
2024	<b>Postdoctoral fellowship FWO project</b> . Ghent University and Flemish Government.
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

<b>As a reviewer</b>	Applied Sciences, Biosensors, Brain Sciences, Communications in Statistics, European Journal of Neuroscience, Journal of Computational and Graphical Statistics, Musicae Scientiae, Sensors, Signal Processing (Elsevier)
<b>As associate editor</b>	Musicae Scientiae (since 2022, SAGE Q1 IF: 2.4)
<b>Event organization</b>	– Symposium “Music interactions and advanced statistical models”, Ghent University (main organizer).

- 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.
- 39th Annual Congress of the Spanish Statistical Society (organizing committee member).

## 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