Marc **Vidal**

Dep of Data Analysis, Ghent University.
Dep of Neurology, Max Planck Institute for Human Cognitive and Brain Sciences
marc.vidalbadia@ugent.be (UGhent) OR vidal@cbs.mpg.de (MPI)

Github ORCID Scopus Math Genealogy

Academic positions

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

Publications

2025 **Vidal, M.** A family of moment operators for functional data and its discriminative properties. In: Aneiros, G., Bongiorno, E., Goia, A., Hušková, M. (eds) *Functional Statistics and Related Fields, IWFOS25, Contributions to Statistics, Springer, Cham.*_DOI: doi.org/10.1007/978-3-031-92383-8_66

Rosseel, Y., **Vidal, M**. A tutorial for understanding SEM using R: Where do all the numbers come from? *British Journal of Mathematical and Statistical Psychology,* 00:1–38. DOI: doi.org/10.1111/bmsp.70003

– **Vidal, M.,** Moura, N., Van Kerrebroeck, B., Aguilera A. M., Fritz, T. H., and Leman, M. Modeling Emotional Arousal With Turbulence Measured by EEG. *Psychophysiology,* 62(6):e70093. DOI: doi.org/10.1111/psyp.70093

– **Vidal, M.**, Leman, M., Aguilera, A. M. Functional independent component analysis by choice of norm: a framework for near-perfect classification. *Advances in Data Analysis and Classification*. DOI: 10.1007/s11634-024-00622-5

– **Vidal, M.**, Aguilera, A. M. Wavelet thresholding on independent subspace factorizations of spatially indexed wide functional data for robust estimation of cortical activity. *Mathematics and Computers in Simulation,* 232:346-361. DOI: 10.1016/j.matcom.2025.01.012

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

– **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

2022 **Vidal, M.**, Aguilera, A. M. Novel whitening approaches in functional settings. *Stat*,12(1):e516. DOI: 10.1002/sta4.516 *Erratum*: follow this link. (Soon available)

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 *Updated version*: follow this link.

Working papers

2025 **Vidal, M.**, Rosseel, Y. Noise-resilient penalty operators based on statistical differentiation schemes.

– **Vidal, M.**, et al. Moments of *H*-valued random elements and generalized Fisher subspaces.

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]

– Moura, N.**, Vidal, M.** Future directions in music embodiment: contributions of a collection of studies including neurophysiological, motor, and behavioral data. Presented at the 18th International Conference on Music Perception and Cognition. São Paulo, Brazil. [Contributed poster]

– **Vidal, M**. A family of moment operators for functional data and its discriminative properties. Presented at the International Workshop on Functional and Operatorial Statistics (IWFOS) 2025. Università del Piemonte Orientale, Novara, Italy. [Contributed talk]

Vidal, M., Aguilera, A. M. EEG-Based Diagnosis of Major Depressive Disorder Using Functional ICA Classification. Presented at the 41th Annual Congress of the Spanish Statistical Society, University of Lleida, Lleida, Spain. [Invited talk]

– **Vidal, M.**, Rosseel, Y. Towards a structural after measurement model for functional data. Presented at the 2025 Meeting of the Structural Equation Modelling. University of Technology Chemnitz, Chemnitz, Germany. [Contributed 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 underlaying principles of functional classification problems. The 31st 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

2020–2024 Joint PhD in Art Science and Mathematical and Applied Statistics (CUM LAUDE) ~ Ghent & Granada Universities
Thesis: 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 – **Dimensionality reduction methods**, Flames course, Ghent University, Ghent, Belgium.

Nov 2023 – **Course in functional statistics**, Ghent University, Ghent, Belgium. Lecture contents: probability principles, curve approximation (Fourier, B-spline, Wavelets), functional PCA and inference with functional data.

2013–2020 – **Tenured lecturer**, Conservatory of Music, Granollers, Spain. Subjects: music theory, piano. Coordination of the Music Theory Department

Merits

2024 **Postdoctoral fellowship "María de Maetzu"**. Institute of Mathematics, University of Granada.

2024 **Postdoctoral fellowship FWO**. Ghent University and Flemish Government.

2024 **Faculty travel Grant**, Ghent University

2024 **Invited research contract**. Max Planck Institute for Human Cognitive and Brain Sciences.

2023 **Doctoral schools fellowship**, Ghent University and Flemish Government.

2022 **Invited research contract**. Max Planck Institute for Human Cognitive and Brain Sciences.

2020 **PhD Fellowship** in Art Science Research, Ghent University and Flemish Government.
2019 International **Master Studies Scholarship**, University of Granada, Erasmus+.
2016 **First Prize** at “Frederic Mompou” International Composition Award.

Service to profession

As a reviewer	Applied Sciences, Biosensors, Brain Sciences, Communications in Statistics, European Journal of Neuroscience, Journal of Computational and Graphical Statistics, Musicae Scientiae, Sensors, Signal Processing (Elsevier)
As associate editor	Musicae Scientiae (since 2022, SAGE Q1 IF: 2.4)
Event organization	– 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

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