

# Sylvain Marchand

## *Curriculum Vitæ*

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Grade : Professeur des Universités 1<sup>ère</sup> classe

Établissement d'affectation : IUT de La Rochelle, 15 rue François de Vaux de Foletier, 17026 La Rochelle

Unité de recherche d'appartenance : Laboratoire Informatique, Image et Interaction (L3i), EA 2118,

Pôle Sciences & Technologie, Université de La Rochelle, avenue Michel Crépeau, 17042 La Rochelle cedex 1

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### Titres et diplômes :

- 2008        **Habilitation à Diriger des Recherches**, LaBRI, Université Bordeaux 1  
Spécialité : informatique musicale, modélisation sonore  
Sujet : « Avancées en modélisation spectrale du son musical »  
Habilitation soutenue le 5 décembre 2008
- 1997–2000   **Doctorat en Informatique**, LaBRI, Université Bordeaux 1  
Spécialité : informatique musicale, modélisation sonore  
Sujet : « Modélisation informatique du son musical »  
Directrice : Myriam Desainte-Catherine  
Thèse soutenue le 12 décembre 2000
- 1995–1996   **DEA Informatique**, Université Bordeaux 1 – LIX (École Polytechnique)  
Spécialité : informatique répartie avec tolérance aux pannes  
Sujet : « Le problème du consensus en environnement distribué asynchrone »  
Directeurs : Robert Cori (LaBRI) et Bernadette Charron-Bost (LIX)
- 1994–1995   **Maîtrise Informatique**, Université Bordeaux 1  
Sujet du mémoire : « Conversion entre protocoles d'informatique musicale »
- 1993–1994   **Licence Informatique**, Université Bordeaux 1

### Expérience professionnelle :

- 2015–...    **Professeur des Universités** (1CL) en informatique  
à l'IUT de La Rochelle
- 2011–2015   **Professeur des Universités** (2CL) en informatique  
à l'Université de Bretagne Occidentale (Brest)
- 2001–2011   **Maître de Conférences** en informatique à l'Université Bordeaux 1  
09/2007–02/2009 en délégation 18 mois auprès du CNRS  
(avec séjours au CIRMMT – McGill et au CCRMA – Stanford)
- 2000–2001   **ATER** à l'Université Bordeaux 1 (2 mi-temps : IUT Info et UFR Math-Info)
- 1997–2000   **Monitorat d'initiation à l'enseignement supérieur** (1998–2000)

## Activités scientifiques

J'étudie les façons de modéliser informatiquement et de manipuler interactivement les images et les sons, en vue d'applications principalement artistiques. Au début concentré sur la manipulation du temps, je me suis ensuite orienté vers la manipulation de l'espace.

Ma recherche fondamentale est constituée par la modélisation spectrale. Je m'intéresse notamment aux méthodes d'analyse précise basées sur la transformée de Fourier. J'ai proposé une **nouvelle méthode basée sur les dérivées du signal sonore**, qui a conduit à la **démonstration de l'équivalence des méthodes basées sur la phase du spectre**.

Ces recherches se sont généralisées au travers de l'analyse de scènes auditives (**audition par ordinateur**), et la séparation de sources sonores en tirant parti par exemple de la structure harmonique ou de la localisation spatiale. Cette approche spatiale (« son 3D ») perceptive a été très poussée, avec notamment la proposition d'un **modèle simplifié d'HRTF (Head-Related Transfer Functions)** utile pour la **localisation** comme la **spatialisation**, prenant en compte l'azimut et la distance (et prochainement l'élévation) de chaque source sonore. Ceci permet une boucle de **rétroaction** : un spatialisateur qui écoute le son produit et ajuste ses paramètres de spatialisation en fonction de l'erreur constatée.

Mais les résultats en séparation de sources se sont eux révélés insuffisants pour une exploitation musicale. Or il est possible d'augmenter la qualité des résultats en injectant de l'information. Je suis ainsi à l'origine d'un nouveau thème de recherche : la **résolution informée de problèmes inverses**, où une information partielle sur la solution permet de contrôler la qualité du résultat. L'informatique musicale est un domaine d'application privilégié, car cette information supplémentaire est accessible en collaborant avec les compositeurs. Ainsi, nous nous sommes attaqués à la séparation de sources sonores (dé-mixage), mais aussi à l'inversion des autres traitements de la chaîne de production : la « dé-composition musicale », ou rétro-ingénierie audio-numérique. Nous avons ainsi rendu possible **l'écoute active** de la musique fixée sur support, c'est-à-dire la possibilité pour l'auditeur de modifier la musique pendant sa diffusion (interaction), à la manière d'un chef d'orchestre ou d'un **Disc Jockey**. J'ai coordonné nationalement le projet ANR DReaM (le Disque Repensé pour l'écoute active de la Musique) sur ce sujet.

Je développe également une activité en informatique graphique, et plus précisément en analyse d'images archéologiques. Le projet IBISA est une application de ces techniques de **vision par ordinateur** à la **reconnaissance d'objets archéologiques** (comme les monnaies antiques).

Ma recherche est donc **pluridisciplinaire**, avec des aspects de traitement des sons et des images, des représentations mathématiques et des considérations psycho-physiques. Mais mon approche reste avant tout celle d'un informaticien, préoccupé par les algorithmes, les structures de données et la complexité. Je m'intéresse ainsi à la modélisation informatique des sons et des images, notamment pour **l'audition et la vision par ordinateur** à des fins d'**interaction**, avec des applications respectivement en musique et en archéologie.

## Rayonnement scientifique

### Comités de lecture de revues internationales

Je suis régulièrement sollicité par les éditeurs respectifs des revues internationales suivantes pour des rapports sur des articles soumis :

- *IEEE Transactions on Audio, Speech, and Language Processing* ;
- *IEEE Transactions on Signal Processing* ;
- *IEEE Journal of Selected Topics in Signal Processing* ;
- *Annals of Telecommunications* ;
- *Journal of the Audio Engineering Society* (JAES) ;
- *EURASIP Journal on Advances in Signal Processing* ;
- *IEEE Signal Processing Letters* ;
- *Signal Processing* (Elsevier).

### Comités de sélection de conférences

Je fais régulièrement partie des comités de lecture des conférences suivantes :

- nationales :
  - CORESA (COmpression et REprésentation des Signaux Audiovisuels) ;
  - JIM (Journées d'Informatique Musicale) ;
- internationales :
  - SMC (*Sound and Music Computing*) ;
  - DAFx (*Digital Audio Effects*) ;
  - EUSIPCO (*EUropean SIgnal Processing COference*) ;
  - CMMR (*International Symposium on Computer Music Modeling and Retrieval*) ;
  - IEEE WASPAA (*Workshop on Applications of Signal Processing to Audio and Acoustics*) ;
  - IEEE ICASSP (*International Conference on Audio, Speech, and Signal Processing*) ;
  - AES (*Audio Engineering Society*) Conferences & Conventions ;
  - CAA (*Computer Applications and Quantitative Methods in Archaeology*).

**Membre du comité scientifique du cycle de conférences internationales DAFx** <http://www.dafx.de>

Je suis membre du comité scientifique de la conférence internationale DAFx (*Digital Audio Effects*) depuis 2006. De plus, à la demande des organisateurs respectifs, j'anime régulièrement une session de cette conférence, en tant que *chairman*. En 2007, j'étais à la tête du comité d'organisation de l'édition de Bordeaux.

### Expertises

Je suis (ou ai été) expert pour

- l'ANR depuis 2010 ;
- le Ministère de l'Enseignement Supérieur et de la Recherche (MESR) / Délégations Régionales à la Recherche et à la Technologie (DRRT) depuis 2011,
- l'AERES en 2012,
- l'HCERES en 2017.

## Publications et production scientifique

### Ouvrages collectifs (livres)

- [1] Sylvain Marchand. *Informatique musicale : du signal au signe musical*, chapter La synthèse additive, page 67–117. Traité IC2, série Informatique et systèmes d’information. HERMES Sciences, Paris, May 2004. ISBN 2-7462-0825-3 (448 pages), in French.
- [2] Sylvain Marchand. *Informatique musicale : du signal au signe musical*, chapter L’analyse de Fourier, page 365–402. Traité IC2, série Informatique et systèmes d’information. HERMES Sciences, Paris, May 2004. ISBN 2-7462-0825-3 (448 pages), in French.
- [3] Gianpaolo Evangelista, Sylvain Marchand, Mark D. Plumbley, and Emmanuel Vincent. *DAFX : Digital Audio Effects*, chapter Sound Source Separation, page 551–588. John Wiley and Sons, Ltd, second edition, 2011. ISBN 978-0-470-66599-2 (604 pages).
- [4] Sylvain Marchand. *Computational Phonogram Archiving*, volume 5 of *Current Research in Systematic Musicology*, chapter Spatial Manipulation of Musical Sound : Informed Source Separation and Respatialization, pages 175–190. Springer Nature Switzerland AG, 2019.

### Articles en revues internationales (avec comités de lecture)

- [5] Myriam Desainte-Catherine and Sylvain Marchand. High Precision Fourier Analysis of Sounds Using Signal Derivatives. *Journal of the Audio Engineering Society*, 48(7/8) :654–667, July/August 2000.
- [6] Sylvain Marchand. Musical Audio Effects in the SAS Model. *Journal of New Music Research*, 30(3) :259–269, September 2001.
- [7] Myriam Desainte-Catherine, György Kurtag, Sylvain Marchand, Catherine Semal, and Pierre Hanna. Playing With Sounds as Playing Video Games. *ACM Journal : Computers in Entertainment*, 2(2) :16, April/June 2004. (22 pages).
- [8] Mathieu Lagrange, Sylvain Marchand, and Jean-Bernard Rault. Long Interpolation of Audio Signals Using Linear Prediction in Sinusoidal Modeling. *Journal of the Audio Engineering Society*, 53(10) :891–905, October 2005.
- [9] Laurent Girin, Mohammad Firouzmand, and Sylvain Marchand. Perceptual Long-Term Variable-Rate Sinusoidal Modeling of Speech. *IEEE Transactions on Audio, Speech, and Language Processing*, 15(3) :851–861, March 2007.
- [10] Mathieu Lagrange and Sylvain Marchand. Estimating the Instantaneous Frequency of Sinusoidal Components Using Phase-Based Methods. *Journal of the Audio Engineering Society*, 55(5) :385–399, May 2007.
- [11] Mathieu Lagrange, Sylvain Marchand, and Jean-Bernard Rault. Enhancing the Tracking of Partial for the Sinusoidal Modeling of Polyphonic Sounds. *IEEE Transactions on Audio, Speech, and Language Processing*, 15(5) :1625–1634, July 2007.
- [12] Sylvain Marchand, Boris Mansencal, and Laurent Girin. Interactive Music with Active Audio CDs. *Lecture Notes in Computer Science – Exploring Music Contents*, 6684 :31–50, 2011. (extended version of the CMMR’10 article).
- [13] Stanislaw Gorlow and Sylvain Marchand. Informed Audio Source Separation Using Linearly Constrained Spatial Filters. *IEEE Transactions on Audio, Speech, and Language Processing*, 21(1) :3–13, January 2013.
- [14] Dominique Fourer and Sylvain Marchand. Informed Spectral Analysis : Audio Signal Parameter Estimation Using Side Information. *EURASIP Journal on Applied Signal Processing*, 2013(1) :178, December 2013.

### Article en revue nationale (avec comité de lecture)

- [15] Mathieu Lagrange, Roland Badeau, Bertrand David, Nancy Bertin, Olivier Derrien, Sylvain Marchand, and Laurent Daudet. Décompositions en éléments sonores et applications musicales. *Traitement du Signal*, 28(6) :665–689, October 2011. In French.

## Conférences internationales (avec comités de programme et actes publiés)

- [16] Sylvain Marchand. Improving Spectral Analysis Precision with an Enhanced Phase Vocoder using Signal Derivatives. In *Proceedings of the Digital Audio Effects (DAFx'98) Workshop*, page 114–118, Barcelona, Spain, November 1998. Audiovisual Institute, Pompeu Fabra University and COST (European Cooperation in the Field of Scientific and Technical Research).
- [17] Myriam Desainte-Catherine and Sylvain Marchand. Vers un modèle pour unifier musique et son dans une composition multiéchelle. In *Proceedings of the Journées d'Informatique Musicale (JIM'99)*, page 59–68, Paris, May 1999. CEMAMu. In French.
- [18] Robert Strandh and Sylvain Marchand. Real-Time Generation of Sound from Parameters of Additive Synthesis. In *Proceedings of the Journées d'Informatique Musicale (JIM'99)*, page 83–88, Paris, May 1999. CEMAMu.
- [19] Myriam Desainte-Catherine and Sylvain Marchand. Structured Additive Synthesis : Towards a Model of Sound Timbre and Electroacoustic Music Forms. In *Proceedings of the International Computer Music Conference (ICMC'99)*, page 260–263, Beijing, China, October 1999. International Computer Music Association (ICMA).
- [20] Sylvain Marchand and Robert Strandh. InSpect and ReSpect : Spectral Modeling, Analysis and Real-Time Synthesis Software Tools for Researchers and Composers. In *Proceedings of the International Computer Music Conference (ICMC'99)*, page 341–344, Beijing, China, October 1999. International Computer Music Association (ICMA).
- [21] Sylvain Marchand. Musical Sound Effects in the SAS Model. In *Proceedings of the Digital Audio Effects (DAFx'99) Workshop*, page 139–142, Trondheim, December 1999. Norwegian University of Science and Technology (NTNU) and COST (European Cooperation in the Field of Scientific and Technical Research).
- [22] Sylvain Marchand. ProSpect : une plate-forme logicielle pour l'exploration spectrale des sons et de la musique. In *Proceedings of the Journées d'Informatique Musicale (JIM'2000)*, page 31–40, Bordeaux, May 2000. SCRIME – LaBRI, Université Bordeaux 1. In French.
- [23] Sylvain Marchand. Compression of Sinusoidal Modeling Parameters. In *Proceedings of the Digital Audio Effects (DAFx'2000) Conference*, page 273–276, Verona, Italy, December 2000. Università degli Studi di Verona and COST (European Cooperation in the Field of Scientific and Technical Research).
- [24] Jean-Christophe Gonzato and Sylvain Marchand. Photo-Realistic Simulation and Rendering of Halos. In Vaclav Skala, editor, *Proceedings of WSCG'2001, the 9th International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision*, volume Short Communications (ISBN 80-7082-713-0), page 106–113, Prague, Czech Republic, February 2001. University of West Bohemia.
- [25] Jean-Christophe Gonzato and Sylvain Marchand. Efficient Simulation of Halos for Computer Graphics. In *Proceedings of ECSIA'2001, the 8th European Congress for Stereology and Image Analysis*, page 181, Bordeaux, France, September 2001. LEPT / CDGA, CNAM.
- [26] Mathieu Lagrange and Sylvain Marchand. Real-Time Additive Synthesis of Sound by Taking Advantage of Psychoacoustics. In *Proceedings of the Digital Audio Effects (DAFx'01) Conference*, page 5–9, Limerick, Ireland, December 2001. University of Limerick and COST (European Cooperation in the Field of Scientific and Technical Research).
- [27] Sylvain Marchand. An Efficient Pitch-Tracking Algorithm Using a Combination of Fourier Transforms. In *Proceedings of the Digital Audio Effects (DAFx'01) Conference*, page 170–174, Limerick, Ireland, December 2001. University of Limerick and COST (European Cooperation in the Field of Scientific and Technical Research).
- [28] Mathieu Lagrange, Sylvain Marchand, and Jean-Bernard Rault. Sinusoidal Parameter Extraction and Component Selection in a Non Stationary Model. In *Proceedings of the Digital Audio Effects (DAFx'02) Conference*, page 59–64, Hamburg, Germany, September 2002. University of the Federal Armed Forces.
- [29] Florian Keiler and Sylvain Marchand. Survey on Extraction of Sinusoids in Stationary Sounds. In *Proceedings of the Digital Audio Effects (DAFx'02) Conference*, page 51–58, Hamburg, Germany, September 2002. University of the Federal Armed Forces.
- [30] Mathieu Lagrange, Sylvain Marchand, Martin Raspaud, and Jean-Bernard Rault. Enhanced Partial Tracking Using Linear Prediction. In *Proceedings of the Digital Audio Effects (DAFx'03) Conference*, page 141–146, London, United Kingdom, September 2003. Queen Mary, University of London.

- [31] Laurent Girin, Sylvain Marchand, Joseph di Martino, Axel Röbel, and Geoffroy Peeters. Comparing the Order of a Polynomial Phase Model for the Synthesis of Quasi-Harmonic Audio Signals. In *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA'03)*, page 193–196, New Paltz, New York, USA, October 2003. Institute of Electrical and Electronics Engineers (IEEE).
- [32] Mathieu Lagrange, Sylvain Marchand, and Jean-Bernard Rault. Partial Tracking Based on Future Trajectories Exploration. In *Proceedings of the 116th Convention of the AES*, Berlin, Germany, May 2004. Audio Engineering Society (AES).
- [33] Mathieu Lagrange, Sylvain Marchand, and Jean-Bernard Rault. Using Linear Prediction to Enhance the Tracking of Partial. In *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'04)*, volume 4, page 241–244, Montreal, Quebec, Canada, May 2004. Institute of Electrical and Electronics Engineers (IEEE).
- [34] Laurent Girin and Sylvain Marchand. Watermarking of Speech Signals Using the Sinusoidal Model and Frequency Modulation of the Partial. In *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'04)*, volume 1, page 633–636, Montreal, Quebec, Canada, May 2004. Institute of Electrical and Electronics Engineers (IEEE).
- [35] Laurent Girin, Mohammad Firouzmand, and Sylvain Marchand. Long Term Modeling of Phase Trajectories within the Speech Sinusoidal Model Framework. In *Proceedings of the INTERSPEECH – 8th International Conference on Spoken Language Processing (ICSLP'04)*, Jeju Island, Korea, October 2004.
- [36] Sylvain Marchand and Martin Raspaud. Enhanced Time-Stretching Using Order-2 Sinusoidal Modeling. In *Proceedings of the Digital Audio Effects (DAFx'04) Conference*, page 76–82, Naples, Italy, October 2004. Federico II University of Naples.
- [37] Mathieu Lagrange, Sylvain Marchand, and Jean-Bernard Rault. Tracking Partial for the Sinusoidal Modeling of Polyphonic Sounds. In *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'05)*, volume 3, page 229–232, Philadelphia, New York, USA, March 2005. Institute of Electrical and Electronics Engineers (IEEE).
- [38] Mohammad Firouzmand, Laurent Girin, and Sylvain Marchand. Comparing Several Models for Perceptual Long-Term Modeling of Amplitudes and Phase Trajectories of Sinusoidal Speech. In *Proceedings of the INTERSPEECH – EUROSPEECH Conference*, Lisboa, Portugal, September 2005.
- [39] Vincent Goudard, Christophe Havel, Sylvain Marchand, and Myriam Desainte-Catherine. Data Anticipation for Gesture Recognition in the Air Percussion. In *Proceedings of the International Computer Music Conference (ICMC'05)*, page 49–52, Barcelona, Spain, September 2005. International Computer Music Association (ICMA).
- [40] Myriam Desainte-Catherine, Pierre Hanna, Christophe Havel, Gyorgy Kurtag, Mathieu Lagrange, Sylvain Marchand, Edgard Nicouleau, Martin Raspaud, Matthias Robine, and Robert Strandh. SCRIME Studio Report. In *Proceedings of the International Computer Music Conference (ICMC'05)*, page 515–518, Barcelona, Spain, September 2005. International Computer Music Association (ICMA).
- [41] Martin Raspaud, Sylvain Marchand, and Laurent Girin. A Generalized Polynomial and Sinusoidal Model for Partial Tracking and Time Stretching. In *Proceedings of the Digital Audio Effects (DAFx'05) Conference*, page 24–29, Madrid, Spain, September 2005. Universidad Politécnica de Madrid.
- [42] Mathieu Lagrange, Sylvain Marchand, and Jean-Bernard Rault. Improving Sinusoidal Frequency Estimation Using a Trigonometric Approach. In *Proceedings of the Digital Audio Effects (DAFx'05) Conference*, page 110–115, Madrid, Spain, September 2005. Universidad Politécnica de Madrid.
- [43] Sylvain Marchand and Mathieu Lagrange. On the Equivalence of Phase-Based Methods for the Estimation of Instantaneous Frequency. In *Proceedings of the 14th European Conference on Signal Processing (EUSIPCO'2006)*, Florence, Italy, September 2006. EURASIP.
- [44] Matthias Robine, Robert Strandh, and Sylvain Marchand. Fast Additive Sound Synthesis Using Polynomials. In *Proceedings of the Digital Audio Effects (DAFx'06) Conference*, page 181–186, Montreal, Quebec, Canada, September 2006. McGill University.
- [45] Guillaume Meurisse, Pierre Hanna, and Sylvain Marchand. A New Analysis Method for Sinusoids+Noise Spectral Models. In *Proceedings of the Digital Audio Effects (DAFx'06) Conference*, page 139–144, Montreal, Quebec, Canada, September 2006. McGill University.

- [46] Joan Mouba and Sylvain Marchand. A Source Localization/Separation/Respatialization System Based on Unsupervised Classification of Interaural Cues. In *Proceedings of the Digital Audio Effects (DAFx'06) Conference*, page 233–238, Montreal, Quebec, Canada, September 2006. McGill University.
- [47] Mathieu Lagrange and Sylvain Marchand. Assessing the Quality of the Extraction and Tracking of Sinusoidal Components : Towards an Evaluation Methodology. In *Proceedings of the Digital Audio Effects (DAFx'06) Conference*, page 239–245, Montreal, Quebec, Canada, September 2006. McGill University.
- [48] Myriam Desainte-Catherine, Sylvain Marchand, Pierre Hanna, Mathieu Lagrange, Matthias Robine, Martin Raspaud, Robert Strandh, Antoine Allombert, Guillaume Meurisse, Joan Mouba, Jean-Louis Di Santo, and Gyorgy Kurtag. SCRIME Studio Report. In *Proceedings of the International Computer Music Conference (ICMC'07)*, page 317–320, Copenhagen, Denmark, August 2007. International Computer Music Association (ICMA).
- [49] Martin Raspaud and Sylvain Marchand. Enhanced Resampling for Sinusoidal Modeling Parameters. In *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA'07)*, page 327–330, New Paltz, New York, USA, October 2007. Institute of Electrical and Electronics Engineers (IEEE).
- [50] Fabien Gallot, Owen Lagadec, Myriam Desainte-Catherine, and Sylvain Marchand. iKlax : a New Musical Audio Format for Interactive Music. In *Proceedings of the International Computer Music Conference (ICMC'08)*, page 85–88, Belfast, Ireland, August 2008. International Computer Music Association (ICMA).
- [51] Joan Mouba, Sylvain Marchand, Boris Mansencal, and Jean-Michel Rivet. RetroSpat : a Perception-Based System for Semi-Automatic Diffusion of Acousmatic Music. In *Proceedings of the Sound and Music Computing (SMC'08) Conference*, page 33–40, Berlin, Germany, July/August 2008.
- [52] Sylvain Marchand and Philippe Depalle. Generalization of the Derivative Analysis Method to Non-Stationary Sinusoidal Modeling. In *Proceedings of the Digital Audio Effects (DAFx'08) Conference*, page 281–288, Espoo, Finland, September 2008. TKK, Helsinki University of Technology.
- [53] Sylvain Marchand and Anne Vialard. The Hough Transform for Binaural Source Localization. In *Proceedings of the Digital Audio Effects (DAFx'09) Conference*, page 252–259, Como, Italy, September 2009. Politecnico di Milano.
- [54] Sylvain Marchand, Pascal Desbarats, Anne Vialard, Françoise Bechtel, Ayed Ben Amara, Béatrice Ciccittini, Jean-Pierre Bost, Alain Bresson, Koray Konuk, and Anthony Beurivé. IBISA : Image-Based Identification / Search for Archaeology. In *Proceedings of the 10th International Symposium on Virtual Reality, Archaeology and Cultural Heritage (VAST'09)*, page 57–60, St. Julians, Malta, September 2009. The Eurographics Association. VAST-STAR, Short and Project Proceedings.
- [55] Brian Hamilton, Philippe Depalle, and Sylvain Marchand. Theoretical and Practical Comparisons of the Reassignment Method and the Derivative Method for the Estimation of the Frequency Slope. In *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA'09)*, page 345–348, New Paltz, New York, USA, October 2009. Institute of Electrical and Electronics Engineers (IEEE).
- [56] Sylvain Marchand, Boris Mansencal, and Laurent Girin. Interactive Music with Active Audio CDs. In *Proceedings of the 7th International Symposium on Computer Music Modeling and Retrieval (CMMR'10)*, page 73–74, Málaga, Spain, June 2010. Universidad de Málaga (Spain).
- [57] Mathieu Lagrange, Roland Badeau, Bertrand David, Nancy Bertin, José Echeveste, Olivier Derrien, Sylvain Marchand, and Laurent Daudet. The DESAM Toolbox : Spectral Analysis of Musical Audio. In *Proceedings of the Digital Audio Effects (DAFx'10) Conference*, page 254–261, Graz, Austria, September 2010. Institute of Electronic Music and Acoustics (IEM).
- [58] Sylvain Marchand and Dominique Fourer. Breaking the Bounds : Introducing Informed Spectral Analysis. In *Proceedings of the Digital Audio Effects (DAFx'10) Conference*, page 359–366, Graz, Austria, September 2010. Institute of Electronic Music and Acoustics (IEM).
- [59] Stanislaw Gorlow and Sylvain Marchand. Informed Source Separation : Underdetermined Source Signal Recovery from an Instantaneous Stereo Mixture. In *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA'11)*, page 309–312, New Paltz, New York, USA, October 2011. Institute of Electrical and Electronics Engineers (IEEE).

- [60] Dominique Fourer and Sylvain Marchand. Informed Spectral Analysis for Isolated Audio Source Parameters Estimation. In *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA'11)*, page 57–60, New Paltz, New York, USA, October 2011. Institute of Electrical and Electronics Engineers (IEEE).
- [61] Nicolas Sturmel, Antoine Liutkus, Jonathan Pinel, Laurent Girin, Sylvain Marchand, Gaël Richard, Roland Badeau, and Laurent Daudet. Linear Mixing Models for Active Listening of Music Productions in Realistic Studio Conditions. In *Proceedings of the 132nd Convention of the AES*, Budapest, Hungary, April 2012. Audio Engineering Society (AES). Best Paper Award.
- [62] Antoine Liutkus, Stanislaw Gorlow, Nicolas Sturmel, Shuhua Zhang, Laurent Girin, Roland Badeau, Laurent Daudet, Sylvain Marchand, and Gaël Richard. Informed Audio Source Separation : A Comparative Study. In *Proceedings of the European Conference on Signal Processing (EUSIPCO'2012)*, Bucharest, Romania, August 2012. EURASIP.
- [63] Dominique Fourer and Sylvain Marchand. Informed Multiple-F0 Estimation Applied to Monaural Audio Source Separation. In *Proceedings of the European Conference on Signal Processing (EUSIPCO'2012)*, Bucharest, Romania, August 2012. EURASIP.
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- [66] Stanislaw Gorlow and Sylvain Marchand. On the Informed Source Separation Approach for Interactive Remixing in Stereo. In *Proceedings of the 134th Convention of the AES*, Roma, Italy, May 2013. Audio Engineering Society (AES).
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- [69] Sylvain Marchand. Fourier-based Methods for the Spectral Analysis of Musical Sounds. In *Proceedings of the 21st European Conference on Signal Processing (EUSIPCO'2013)*, Marrakech, Morocco, September 2013. EURASIP.
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## **Brevets**

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- FR0952397, FR2010050583, WO2010116068 : Procédé et dispositif de formation d'un signal mixé, procédé et dispositif de séparation de signaux, et signal correspondant (France, Europe, États-Unis), co-inventeurs : Mathieu Parvaix, Laurent Girin, Jean-Marc Brossier et Sylvain Marchand (2010) ;
- FR1159310, EP2012069625, WO2013053631 : Procédé et dispositif pour séparer des signaux par filtrage spatial itératif (France), co-inventeurs : Stanislaw Gorlow et Sylvain Marchand (2013) ;
- FR1259115, EP2013069937, WO2014048970 : Procédé et dispositif pour séparer des signaux par filtrage spatial à variance minimum sous contrainte linéaire, co-inventeurs : Stanislaw Gorlow et Sylvain Marchand (2014).

## **Norme**

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