

## DOCTORAL THESIS BOARD

Doctoral student: Georgi Dzhambazov	
Title of the Doctoral Thesis: Knowledge-based Probabilistic Modeling for Tracking Lyrics in Music Audio Signals	
Doctoral Programme : Information and Comm. Technologies	Deposit date: 26.04.2017
Supervisor 1: Dr. Xavier Serra Casals University: Universitat Pompeu Fabra, Barcelona	NATIONAL ID NO.: 36936560D E-mail: <a href="mailto:xavier.serra@upf.edu">xavier.serra@upf.edu</a>
Supervisor 2: University:	NATIONAL ID NO.: E-mail:

Joint Supervision (*Cotutela*) :    ☐ Yes    ☒ No

Videoconference (*Member*):    ☐ Yes    ☒ No

### PROPOSED DOCTORAL THESIS BOARD \*

	Name and surname(s)	University
<b>President</b>	Axel Röbel	IRCAM, France
<b>Secretary</b>	Emilia Gómez	Universitat Pompeu Fabra
<b>Member</b>	Matthias Mauch	Queen Mary University of London, UK
<b>Substitute 1</b>	Rafael Ramirez	Universitat Pompeu Fabra
<b>Substitute 2</b>	Maarten Grachten	Institut d'Investigació en Intel·ligència Artificial (IIIA)

(date)	<i>Signature(s) of the doctoral thesis supervisor(s)</i>
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Academic committee approval:
(date)

\*Attached: Suitability reports on the 5 proposed members

### APPROVAL OF THE DOCTORAL THESIS BOARD

I, Dra. Núria Sebastián Gallés, director of the Pompeu Fabra University Doctoral School,

- Designate the board members proposed by the doctoral thesis supervisor
- Do not approve the board proposal submitted by the doctoral thesis supervisor

(Date)	<i>Signature of the Director of the Doctoral School</i>
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### PROPOSAL FOR PRESIDENT OF THE BOARD

Dr.: Axel Röbel	National ID /passport no.: C4TY5NJM4
Doctor from the University Technical University of Berlin	Year: 1993
University/Research Centre: Institut de Recherche et Coordination Acoustique/Musique (IRCAM)	A c a d e m i c Professor category:
Department/Institution: Analysis/Synthesis team	
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### SUITABILITY REPORT

- **Explanation of the research done in the subject area of the thesis (preferably in the last 5 years) justifying knowledge of the subject and accrediting the doctor proposed as a member of this board.**

Dr. Axel Röbel is a professor and head of the Institut de Recherche et Coordination Acoustique/Musique (IRCAM), France. His team is one of the pioneers in Music Information Retrieval and leading research unit in singing voice analysis (the main topic of my thesis). He has been at IRCAM for around 10 years and participated either as a collaborator or the principal investigator in more than 5 projects. His ongoing projects cover several relevant topics such as singing voice analysis/transformation.

- **List of 5 publications or relevant contributions (preferably in the last 5 years) accrediting the scientific value of the proposed board member.**

Obin, N., Roebel A., Similarity Search of Acted Voices for Automatic Voice Casting, IEEE/ACM Transactions on Audio, Speech and Language Processing, vol. 24, n° 9, Septembre, 2016

Huber, S. and Roebel, A., Voice quality transformation using an extended source-filter speech model. In 12th Sound and Music Computing Conference (SMC) 2015, July, (pp. 69-76).

Degottex G., Ardaillon L., Roebel A., Multi-frame amplitude envelope estimation for modification of singing voice, IEEE/ACM Transactions on Audio, Speech and Language Processing, Institute of Electrical and Electronics Engineers, 2016, 24 (7), pp.1242-1254

Roebel A., Pons J., Liuni M, Lagrange M., On automatic drum transcription using non-negative matrix deconvolution and itakura saito divergence, Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Apr 2015, Brisbane, Australia. pp.414 - 418

Ardaillon L., Degottex G., Roebel A, A multi-layer F0 model for singing voice synthesis using a B-spline representation with intuitive controls, Interspeech 2015, Sep 2015, Dresden, Germany

## PROPOSAL FOR SECRETARY OF THE BOARD

Dr.: Emilia Gómez		National ID: 28912150-T	
Doctor from the University Universitat Pompeu Fabra		Year:	2006
University/Research Centre: Universitat Pompeu Fabra		Academic category:	Associate Professor
Department/Institution:	Dept. of Information and Communication Technologies		
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### SUITABILITY REPORT

- **Explanation of the research done in the subject area of the thesis (preferably in the last 5 years) justifying knowledge of the subject and accrediting the doctor proposed as a member of this board.**

Dr. Emilia Gomez is a leading researcher within the Music Information Retrieval (MIR) field. She aims to understand the way humans describe music and emulate these descriptions by computational models dealing with big music data. She has developed methods to automatically describe music audio signals in terms of melody, tonality and rhythm; to measure similarity between pieces and automatically classify music according to style, emotion or culture. In addition, she has researched on the computational modeling of flamenco music, improving current techniques for automatic singing voice description. In this thesis we have used as a baseline some of her work. She is also the president elect of the International Society for Music Information Retrieval.

- **List of 5 publications or relevant contributions (preferably in the last 5 years) accrediting the scientific value of the proposed board member**

Kroher, N., & Gómez E. (2016). Automatic Transcription of Flamenco Singing From Polyphonic Music Recordings. IEEE/ACM Transactions on Audio, Speech, and Language Processing. 25(5), 901-913.

Mora, J., Gómez-Martin F., Gómez E., & Díaz-Báñez J. M. (2016). Melodic Contour and Mid-Level Global Features Applied to the Analysis of Flamenco Cantes. Journal of New Music Research .

Valero-Mas, J. J., Salamon J., & Gómez E. (2015). Analyzing the influence of pitch quantization and note segmentation on singing voice alignment in the context of audio-based Query-by-Humming. Sound and Music Computing Conference.

Oramas, S., Gómez F., Gómez E., & Mora J. (2015). FlaBase: Towards the Creation of a Flamenco Music Knowledge Base. 16th International Society for Music Information Retrieval Conference.

Kroher, N., Gómez E., Guastavino C., Gómez-Martín F., & Bonada, J. (2014). Computational models for perceived melodic similarity in a cappella flamenco cantes. 15th International Society for Music Information Retrieval Conference.

PROPOSAL FOR MEMBER OF THE BOARD	
Dr.:Matthias Mauch	National ID /passport no.: C7X0N6XF9
Doctor from the University: Queen Mary University of London	Year: 2010
University/Research Centre: Queen Mary University of London	A c a d e m i c V i s i t i n g category: Academic
Department/Institution: School of Electronic Engineering and Computer Science	
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Contact telephone: +44 7852 671648	Contact fax number:-

SUITABILITY REPORT
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- **Explanation of the research done in the subject area of the thesis (preferably in the last 5 years) justifying knowledge of the subject and accrediting the doctor proposed as a member of this board.**

Dr. Matthias Mauch is a visiting lecturer and researcher in music informatics at Queen Mary University of London (QMUL). QMUL is one of the leading groups in Music Information Retrieval.

In recent years his research has been focused on probabilistic modeling for tracking singing voice and has yielded some seminal papers that have established the field. Some of the modeling methods presented in this thesis build upon his research, in particular upon his singing melody note transcription algorithms. He is also the author of one of the state-of-the art systems for Lyrics-to-audio alignment (the topic of this thesis).

- **List of 5 publications or relevant contributions (preferably in the last 5 years) accrediting the scientific value of the proposed board member.**

M. Mauch, C. Cannam, R. Bittner, G. Fazekas, J. Salamon, Jiajie Dai, J. Bello, and S. Dixon. Computer-aided melody note transcription using the tony software: Accuracy and efficiency. In Proceedings of the First International Conference on Technologies for Music Notation and Representation (TENOR 2015), pages 23–30, 2015

M. Mauch and K. Frieler, S. Dixon, Intonation in Unaccompanied Singing: Accuracy, Drift and a Model of Reference Pitch Memory, Journal of the Acoustical Society of America, 2014.

M. Mauch, H. Fujihara, and M. Goto. Integrating additional chord information into hmm-based lyrics-to-audio alignment. Audio, Speech, and Language Processing, IEEE Transactions on, 20(1):200–210, 2012

S. Dixon, M. Mauch and D. Tidhar, Estimation of Harpsichord Inharmonicity and Temperament from Musical Recordings, Journal of the Acoustical Society of America, 2011.

M. Mauch, Automatic Chord Transcription from Audio Using Computational Models of Musical Context. PhD thesis, Queen Mary University of London, 2010.

**PROPOSAL FOR SUPLENT OF THE BOARD**

Dr.: Rafael Ramirez	National ID /passport no.: x4539697a
Doctor from the University: Bristol University	Year: 1997
University/Research Centre: Universitat Pompeu Fabra	A c a d e m i c A s s o c i a t e category: Professor
Department/Institution: Dept. of Information and Communication Technologies	
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Contact telephone:	Contact fax number:

**SUITABILITY REPORT**

- **Explanation of the research done in the subject area of the thesis (preferably in the last 5 years) justifying knowledge of the subject and accrediting the doctor proposed as a member of this board.**

Dr. Rafael Ramirez is an Associate Professor and leader of the Music and Machine Learning Lab at the Music Technology Group at UPF. The aim of his research is to understand and simulate music creativity by modeling music processes and high-level music actions. He supervises projects that conduct research on topics such as machine learning, expressive music performance modeling. To this end, some of his main research methods include temporal probabilistic models, which are the main contribution of this thesis. He is also the organiser of the International Workshop on Machine Learning and Music (MML).

- **List of 5 publications or relevant contributions (preferably in the last 5 years) accrediting the scientific value of the proposed board member.**

Ramirez, R., Giraldo, S., Vamvakousis, Z. (2013), EEG-Based Emotion Detection in Music Listening, In Proceedings of the Fifth International Brain-Computer Interface Meeting 2013. Graz University of Technology Publishing House, University of Technology Publishing House, California, USA

Ramirez, R., Giraldo, S., Vamvakousis, Z. (2013) EEG-Based Emotion Detection In Live-Music Listening, In proc. of International Conference on Music & Emotion. Jyväskylä, Finland.

Ramirez, R., Maestre, E., Serra, X. (2012). A Rule-Based Evolutionary Approach to Music Performance Modeling, IEEE Transactions on Evolutionary Computation, 16(1): 96-107.

Ramirez, R., Maestre, E., Serra, X. (2011). Automatic Performer Identification in Celtic Violin Audio Recordings, Journal of New Music Research, 40(2): 165–174.

Ramirez, R., Vamvakousis, Z. (2012). Detecting Emotion from EEG Signals using the Emotiv Epoc Device, Lecture Notes in Computer Science 7670, Springer.



**PROPOSAL FOR SUPPLEMENT OF THE BOARD**

Dr.:Maarten Grachten	National ID /passport no.: NX44HF1R6
Doctor from the University Universitat Pompeu Fabra	Year: 2007
University/Research Centre: Campus UAB	Academic Senior category: Researcher
Department/Institution: Institut d'Investigació en Intel·ligència Artificial (IIIA)	
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**SUITABILITY REPORT**

- **Explanation of the research done in the subject area of the thesis (preferably in the last 5 years) justifying knowledge of the subject and accrediting the doctor proposed as a member of this board.**

Dr. Maarten Grachten is one of the leading researchers in computational modelling of expression in music performances, including expression of singing voice. His methods include mainly probabilistic learning and self organization. In this respect, he is one of the experts of tracking in a probabilistic way music performance, which is highly related to the methods we propose in this thesis. Over the last years, he has been one of the principal researchers in the PHENICX FP7 STREP EU Project, trying to innovate the way we experience classical music concerts.

- **List of 5 publications or relevant contributions (preferably in the last 5 years) accrediting the scientific value of the proposed board member.**

Chacón C. E. Cancino, Grachten M. (2016). The Basis Mixer: A Computational Romantic Pianist. Late Breaking/Demo at the 17th International Society for Music Information Retrieval Conference (ISMIR 2016), New York, USA

G. Velarde, T. Weyde, C. E. Cancino Chacón, D. Meredith, M. Grachten (2016). Composer Recognition based on 2D-Filtered Piano-Rolls. In Proceedings of the 17th International Society for Music Information Retrieval Conference (ISMIR 2016), New York, USA

T. Gadermaier, M. Grachten, C. E. Cancino Chacón (2016). Modeling Loudness Variations in Ensemble Performance. In Proceedings of the 2nd International Conference on New Music Concepts (ICNMC 2016). Treviso, Italy

M. Grachten, C. E. Cancino Chacón (2015). Strategies for Conceptual Change in Convolutional Neural Networks. Technical Report, Österreichisches Forschungsinstitut für Artificial Intelligence, Wien, TR-2015-04.

C. E. Cancino Chacón, M. Grachten (2015). An evaluation of score descriptors combined with non-linear models of expressive dynamics in music. In Proceedings of the 18th International Conference on Discovery Science (DS 2015). pp. 48-62