Carlos Eduardo Cancino-Chacón

PERSONAL DETAILS

Birth	June 6, 1986
Citizenship	Mexican
Address	Austrian Research Institute for Artificial Intelligence (OFAI) Freyung 6 / 6 A-1010, Vienna, Austria
E-Mail	carlos.cancino@ofai.at
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MAIN AREAS OF RESEARCH

- Computational models of expressive music performance and music expectation
- Human–Computer interaction in music performance (automatic accompaniment systems, interfaces for musical expression)
- Cognitively-plausible computational models of music analysis
- Machine Learning (Deep Learning, Probabilistic Models)

ACADEMIC QUALIFICATIONS

PhD in Computer Science 10/2014–12/2018

Johannes Kepler University of Linz, Austria

Supervisor: Gerhard Widmer
Co-supervisor: Maarten Grachten
Thesis: Computational Modeling of Expressive Music Performance Through Linear and Non-linear Basis Function Models

Master's degree in Electrical Engineering and Audio Engineering 10/2011–07/2014

Graz University of Technology/University of Music and Performing Arts Graz, Austria

Supervisor: Franz Pernkopf
Thesis: Tarkus Belief Propagation: On Message Passing Algorithms and Computational Commutative Algebra

Bachelor's degree in Physics 08/2005–03/2011

National Autonomous University of Mexico, Mexico City, Mexico

Supervisor: Marcos Ley Koo
Thesis: Análisis teórico experimental de transductores de ultrasonido tipo Langevin

Bachelor's degree in Piano Performance 09/1999–02/2011

National Conservatory of Music, Mexico City, Mexico

Supervisor: Héctor Alfonso Rojas Ramírez

RESEARCH AND TEACHING EXPERIENCE

Postdoctoral Researcher 12/2018-present
Austrian Research Institute for Artificial Intelligence, Vienna, Austria
Intelligent Music Processing and Machine Learning Group
Project: Con Espressione (ERC grant)
Supervisor: Gerhard Widmer

Predoctoral Researcher 01/2014-11/2018
Austrian Research Institute for Artificial Intelligence, Vienna, Austria
Intelligent Music Processing and Machine Learning Group
Projects:

- Lrn2Cre8 (EU FP7 grant) (01/2014 – 09/2016)
  Supervisors: Maarten Grachten and Gerhard Widmer
- Con Espressione (ERG grant) (10/2016 – 11/2018)
  Supervisor: Gerhard Widmer

Course Lecturer Level B 01/2011-07/2011
National Conservatory of Music, Mexico City, Mexico
Courses: Elementary Music Theory I and Harmony (Levels I-III)

ACADEMIC ACTIVITIES

REVIEWING

1. **Journals:** Journal of New Music Research (2017), Neural Computing and Applications (2018)
2. **Conferences:** MCM (2015), DLM17 (2017), ISMIR (2014, 2015, 2016, 2017, 2018, 2019), SMC (2019), IJCAI (2019)

TALKS

1. Cancino-Chacón, C., Kosta, K. and Grachten, M. (upcoming November 2019) "Computational Models of Expressive Performance", tutorial session at the 20th International Society for Music Information Retrieval Conference, Delft, The Netherlands.
2. Cancino-Chacón, C. (March 2019) "Modeling Expressive Music Performance with Non-linear Basis Function Models", invited talk, Deep Learning Seminar, University of Vienna, Austria.
3. Cancino-Chacón, C. (January 2019) "Computational Modeling of Expressive Music Performance with Linear and Non-linear Basis Function Models", invited talk, Austrian Research Institute for Artificial Intelligence, Vienna, Austria.
4. Cancino-Chacón, C. (November 2016) "¿Escuchan los androides música electrónica?", invited talk, Pláticas DeMentes talk series. Faculty of Psychology, National Autonomous University of Mexico.
5. Cancino-Chacón, C. (November 2016) "En busca del factor Mozart", invited talk, National Conservatory of Music, Mexico City, Mexico.

AWARDS AND GRANTS

Award for Creative Achievement 06/2017
AccompaniX Competition, 2017 Turing Tests in the Creative Arts.
$500 team award for development of an expressive computer accompaniment system.

Fundación INBA – CONACYT Scholarship
Mexican National Council for Science and Technology 10/2012-02/2014

PUBLICATIONS

PEER REVIEWED JOURNAL ARTICLES

1. Bishop, L., Cancino-Chacón, C., and Goebel, W. (2019b). Moving to communicate, moving to interact: Patterns of body motion in musical duo performance. *Music Perception*, 37(1):1–25

2. Bishop, L., Cancino-Chacón, C., and Goebel, W. (2019a). Eye gaze as a means of giving and seeking information during musical interation. *Consciousness & Cognition*, 68:73–96

3. Cancino-Chacón, C., Grachten, M., Goebl, W., and Widmer, G. (2018). Computational Models of Expressive Music Performance: A Comprehensive and Critical Review. *Frontiers in Digital Humanities*, 5:25. `https://www.frontiersin.org/article/10.3389/fdigh.2018.00025`

4. Velarde, G., Cancino-Chacón, C., Meredith, D., Weyde, T., and Grachten, M. (2018). Convolution-based classification of audio and symbolic representations of music. *Journal of New Music Research*, 47(3):191–205. doi: 10.1080/09298215.2018.1458885

5. Cancino-Chacón, C. E., Gadermaier, T., Widmer, G., and Grachten, M. (2017d). An Evaluation of Linear and Non-linear Models of Expressive Dynamics in Classical Piano and Symphonic Music. *Machine Learning*, 106(6):887–909

6. Grachten, M., Cancino-Chacón, C. E., Gadermaier, T., and Widmer, G. (2017). Towards computer-assisted understanding of dynamics in symphonic music. *IEEE Multimedia*, 24(1):36–46

BOOK CHAPTERS

1. Grachten, M. and Cancino-Chacón, C. E. (2017). Temporal dependencies in the expressive timing of classical piano performances. In Lessafre, M., Maes, P.-J., and Leman, M., editors, *The Routledge Companion to Embodied Music Interaction*, pages 360–369. Routledge

PEER REVIEWED CONFERENCE PROCEEDINGS

1. Simonetta, F., Cancino-Chacón, C., Ntalampiras, S., and Widmer, G. (2019). A Convolutional Approach to Melody Line Identification in Symbolic Scores. In *Proceedings of the 20th International Society for Music Information Retrieval Conference (ISMIR 2019)*, Delft, The Netherlands

2. Cancino-Chacón, C., Grachten, M., Sears, D. R. W., and Widmer, G. (2017c). What Were You Expecting? Using Expectancy Features to Predict Expressive Performances of Classical Piano Music. In *Proceedings of the 10th International Workshop on Machine Learning and Music (MML 2017)*, Barcelona, Spain

3. Cancino-Chacón, C., Grachten, M., and Agres, K. (2017b). From Bach to The Beatles: The Simulation of Human Tonal Expectation Using Ecologically-Trained Predictive Models. In *Proceedings of the 18th International Society for Music Information Retrieval Conference (ISMIR 2017)*, Suzhou, China

4. Velarde, Gissel and Weyde, Tillman and Cancino Chacón, Carlos and Meredith, David and Grachten, Maarten (2016). Composer Recognition Based On 2D-Filtered Piano Rolls. In *Proceedings of the 17th International Society for Music Information Retrieval Conference (ISMIR 2016)*, pages 116–121, New York, NY, USA

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

6. Cancino Chacón, C. E. and Grachten, M. (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)*, pages 48–62, Banff, AB, Canada

7. Agres, K., Cancino, C., Grachten, M., and Lattner, S. (2015). Harmonics co-occurrences bootstrap pitch and tonality perception in music: Evidence from a statistical unsupervised learning model. In *Proceedings of the Annual Meeting of the Cognitive Science Society (CogSci 2015)*, Pasadena, CA, USA

8. Lattner, S., Grachten, M., Agres, K., and Cancino Chacón, C. E. (2015b). Probabilistic Segmentation of Musical Sequences using Restricted Boltzmann Machines. In *Fifth International Conference on Mathematics and Computation in Music (MCM 2015)*, London, UK

9. Lattner, S., Cancino Chacón, C. E., and Grachten, M. (2015a). Pseudo-Supervised Training Improves Unsupervised Melody Segmentation. In *In Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence (IJCAI 2015)*, pages 2459–2465, Buenos Aires, Argentina

10. Cancino Chacón, C. E. and Mowlaee, P. (2014). Least Squares Phase Estimation of Mixed Signals. In *15th Annual Conference of the International Speech Communication Association (INTERSPEECH 2014)*, Singapore

11. Cancino Chacón, C., Lattner, S., and Grachten, M. (2014a). Developing Tonal Perception Through Unsupervised Learning. In *Proceedings of the 15th International Society for Music Information Retrieval Conference (ISMIR 2014)*, pages 195–200

12. Grachten, M., Cancino Chacón, C. E., and Widmer, G. (2014). Analysis and Prediction of Expressive Dynamics Using Bayesian Linear Models. In *Proceedings of the 1st International Workshop on Computer and Robotic Systems for Automatic Music Performance (SAMP 14)*, pages 545–552, Venice, Italy

13. Tschiatschek, S., Cancino Chacón, C. E., and Pernkopf, F. (2013). Bounds for Bayesian network classifiers with reduced precision parameters. In *Proceedings of the 2013 International Conference on Acoustics, Speech and Signal Processing (ICASSP 2013)*, pages 3357–3361, Vancouver, Canada. IEEE

EXTENDED ABSTRACTS

1. Cancino-Chacón, C. E., Balke, S., Henkel, F., Stussak, C., and Widmer, G. (2019). The *Con Espressione!* Exhibit: Exploring Human–Machine Collaboration in Expressive Performance. In *Late Breaking/ Demo, 20th International Society for Music Information Retrieval Conference (ISMIR 2019)*, Delft, The Netherlands

2. Grachten, M., Cancino-Chacón, C., and Gadermaier, T. (2019). partitura: A Python Package for Handling Symbolic Musical Data. In *Late Breaking/ Demo, 20th International Society for Music Information Retrieval Conference (ISMIR 2019)*, Delft, The Netherlands

3. Weigl, D., Cancino-Chacón, C., Bonev, M., and Goebel, W. (2019). Linking and Visualising Performance Data and Semantic Music Encodings in Real-Time. In *Late Breaking/ Demo, 20th International Society for Music Information Retrieval Conference (ISMIR 2019)*, Delft, The Netherlands

4. Shi, Z., Cancino-Chacón, C., and Widmer, G. (2019). User Curated Shaping of Expressive Performances. In *Invited Paper at the ICML 2019 Workshop on Machine Learning for Music Discovery, 36th International Conference on Machine Learning (ICML 2019)*, Long Beach, CA, USA

5. Cancino-Chacón, C. and Grachten, M. (2018). A Computational Study of the Role of Tonal Tension in Expressive Piano Performance. In *Proceedings of the 15th International Conference on Music Perception and Cognition (ICMPC15 ESCOM10)*, Graz, Austria

6. Bishop, L., Cancino-Chacón, C. E., and Goebl, W. (2018). Visual Signals between Improvisers Indicate Attention rather than Intentions. In *Proceedings of the 15th International Conference on Music Perception and Cognition (ICMPC15 ESCOM10)*, Graz, Austria

7. Cancino-Chacón, C., Bonev, M., Durand, A., Grachten, M., Arzt, A., Bishop, L., Goebl, W., and Widmer, G. (2017a). The ACCompanion v0.1: An Expressive Accompaniment System. In *Late Breaking/ Demo, 18th International Society for Music Information Retrieval Conference (ISMIR 2017)*, Suzhou, China

8. Bishop, L., Cancino-Chacón, C., and Goebel, W. (2017). Mapping Visual Attention of Duo Musicians During Rehearsal of Temporally-Ambiguous Music. In *Proceedings of the International Symposium on Performance Science (ISPS 2017)*, Reykjavik, Iceland

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

TECHNICAL REPORTS

1. Cancino-Chacón, C. E. and Grachten, M. (2016). Rendering Expressive Performances of Musical Pieces Through Sampling From Generative Probabilistic Models. Technical Report OFAI-TR-2014-01, Austrian Research Institute for Artificial Intelligence, Vienna, Austria

2. Grachten, M. and Cancino Chacón, C. E. (2015). Strategies for Conceptual Change in Convolutional Neural Networks. Technical Report OFAI-TR-2015-04, Austrian Research Institute for Artificial Intelligence, Vienna, Austria

3. Cancino Chacón, C. E., Grachten, M., and Widmer, G. (2014b). Bayesian Linear Basis Models with Gaussian Priors for Musical Expression. Technical Report OFAI-TR-2014-12, Austrian Research Institute for Artificial Intelligence, Vienna, Austria