Oriol Nieto

CONTACT INFORMATION

Pandora Media, Inc.
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RESEARCH INTERESTS

Machine Learning, Deep Learning, Music Information Retrieval, Large-scale Recommender Systems.

EDUCATION

New York University, New York City, NY USA

Ph.D., Music Technology, Defended in February 2015

- Dissertation Title: *Discovering Structure in Music: Automatic Approaches and Perceptual Evaluations*
- Adviser: Professor Morwaread Farbood
- Co-Adviser: Professor Juan Pablo Bello
- Areas of Study: Music information retrieval, machine learning, music cognition

Stanford University, Stanford, CA USA

M.A., Music, Science and Technology, August 2010

- Adviser: Professor Jonathan Berger
- Digital Audio Signal Processing
- Music Computing and Design
- Stanford Laptop Orchestra
- Area of Study: Music Technology

Pompeu Fabra University, Barcelona, Spain

M.S., Information, Communication and Audiovisual Media Technologies, June 2008

- Thesis: *Voice Transformations for Extreme Vocal Effects*
- Advisers: Professors Xavier Serra and Jordi Bonada
- Ground Truth Data Base for Voice and Music Information Retrieval algorithms

Polytechnic University of Catalonia, Barcelona, Spain

B.S., Computer Engineering, June 2007

- Thesis: *Open Source Development for e-Learning*
- Adviser: Professor Marc Alier
- Software Engineering T.A.
- Operating Systems T.A.

PUBLICATIONS

Oramas, S., Nieto, O., Sordo, M., Serra, X., A Deep Multimodal Approach for Cold-start Music Recommendation. Deep Learning for Recommender Systems Workshop, RecSys, Como, Italy, 2017.

McFee, B., Nieto, O., Farbood, M., Bello, J. P., Evaluating Hierarchical Structure In Music Annotations. Frontiers in Psychology, section Cognition, 2017.

Oramas, S., Nieto, O., Barbieri, F., Serra, X., Multi-label Music Genre Classification From Audio, Text, and Images Using Deep Features. Proc. of the 18th International Society for Music Information Retrieval Conference (ISMIR). Suzhou, China, 2017.

Nieto, O., Bello, J. P., Systematic Exploration Of Computational Music Structure Research. Proc. of the 17th International Society for Music Information Retrieval Conference (ISMIR). New York City, NY, USA, 2016.

Nieto, O., MSAF V0.1.0 Submission. Music Information Retrieval Evaluation eXchange (MIREX). New York City, NY, USA, 2016.

McFee, B., Nieto, O., Bello, J. P., Hierarchical Evaluation of Segment Boundary Detection. Proc. of the 16th International Society for Music Information Retrieval Conference (ISMIR). Málaga, Spain, 2015.

McFee, B., Raffel, C., Liang, D., Ellis, D. P. W., McVicar, M., Battenberg, E., Nieto, O., LibROSA: Audio and Music Signal Analysis in Python. Proc. of the 14th Python in Science Conference. Austin, TX, USA, 2015.

Nieto, O., Discovering Structure in Music: Automatic Approaches and Perceptual Evaluations, Ph.D Dissertation, New York University, 2015.

Nieto, O., Bello, J.P., MIREX 2014 Entry: 2D Fourier Magnitude Coefficients. Music Information Retrieval Evaluation eXchange (MIREX), Taipei, Taiwan, 2014.

Nieto, O., Farbood, M., MIREX 2014 Entry: Music Segmentation Techniques and Greedy Path Finder Algorithm to Discover Musical Patterns. Music Information Retrieval Evaluation eXchange (MIREX), Taipei, Taiwan, 2014.

Nieto, O., Jehan, T., MIREX 2014 Entry: Convex Non-negative Matrix Factorization. Music Information Retrieval Evaluation eXchange (MIREX), Taipei, Taiwan, 2014.

Nieto, O., Farbood, M., Identifying Polyphonic Musical Patterns From Audio Recordings Using Music Segmentation Techniques. Proc. of the 15th International Society for Music Information Retrieval Conference (ISMIR). Taipei, Taiwan, 2014.

Nieto, O., Farbood, M., Jehan, T., Bello, J.P., Perceptual Analysis of the F-Measure to Evaluate Section Boundaries in Music. Proc. of the 15th International Society for Music Information Retrieval Conference (ISMIR). Taipei, Taiwan, 2014.

Raffel, C., McFee, B., Humphrey, E., Salamon, J., Nieto, O., Liang, D., Ellis, D., `mir_eval`: A Transparent Implementation of Common MIR Metrics. Proc. of the 15th International Society for Music Information Retrieval Conference (ISMIR). Taipei, Taiwan, 2014.

Humphrey, J.E., Salamon, J., Nieto, O., Forsyth, J., Bittner, R., Bello, J.P., JAMS: A JSON Annotated Music Specification for Reproducible MIR Research. Proc. of the 15th International Society for Music Information Retrieval Conference (ISMIR). Taipei, Taiwan, 2014.

Ballús, A., Arnau, E., Nieto, O., Font, F., Torrents, A. G., Embodying Theoretical Research in Music Cognition: Four Proposals for Theory-Driven Experimentation. In Proc. of the 13th International Conference on Music Perception and Cognition. Seoul, South Korea, 2014.

Nieto, O., Bello, J.P., Music Segment Similarity Using 2D-Fourier Magnitude Coefficients. Proc. of the 39th IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP). Florence, Italy, 2014.

Nieto, O., Smith, J. B. L., 2013 Late Break Session on Music Segmentation. Proc. of the 14th International Society for Music Information Retrieval Conference (ISMIR). Curitiba, Brazil, 2013.

Nieto, O., Farbood, M., MIREX 2013: Discovering Musical Patterns Using Audio Structural Segmentation Techniques. Music Information Retrieval Evaluation eXchange (MIREX), Curitiba, Brazil, 2013.

Nieto, O., Shasha, D., *Hand Gesture Recognition in Mobile Devices: Enhancing The Musical Experience*. Proc. of the 10th International Symposium on Computer Music Multidisciplinary Research (CMMR). Marseille, France, 2013.

Humphrey, E. J., Nieto, O., Bello, J. P., *Data Driven and Discriminative Projections for Large-Scale Cover Song Identification*. Proc. of the 14th International Society for Music Information Retrieval Conference (ISMIR). Curitiba, Brazil, 2013.

Park, T.H., Crawford, L., Nieto, O., *Even More Tactile Feedback for Mobile Devices*. Proc. of the 39th International Computer Music Conference (ICMC), Perth, Australia, 2013.

Park, T.H., Nieto, O., *Fortissimo: Force-Feedback for Mobile Devices*. Proc. of the 13th International Conference on New Interfaces for Musical Expression (NIME), Kaist, South Korea, 2013.

Nieto, O., *Unsupervised Clustering of Extreme Vocal Effects*. Proc. of the 10th International Conference Advances in Quantitative Laryngology, Voice and Speech Research (AQL), pages 115-116. Cincinnati, OH, USA, 2013.

Nieto, O., Jehan, T., *Convex Non-negative Matrix Factorization For Automatic Music Structure Identification*. Proc. of the 38th International Conference on Acoustics, Speech, and Signal Processing (ICASSP). Vancouver, Canada, 2013.

Rocha, B., Smith, J.B.L., Peeters, G., Ross, J.C., Nieto, O., Van Balen, J., *Late-break Session on Music Structure Analysis*. Proc. of the 13th International Society for Music Information Retrieval Conference (ISMIR). Porto, Portugal, 2012.

Nieto O., Humphrey E. J., Bello J. P., *Compressing Music Recordings Into Audio Summaries*. Proc. of the 13th International Society for Music Information Retrieval Conference (ISMIR), Porto, Portugal, 2012.

Nieto O., Farbood M., *Evaluating Automatically Extracted Music Motives*. Proc. of the 12th International Conference on Music Perception and Cognition (ICMPC). Thessaloniki, Greece, 2012.

Nieto O. *Voice Transformations for Extreme Vocal Effects*. Pompeu Fabra University. 2008.

Nieto O., Pajuelo A., López D., Millan A., Heredero A., Duran A., Herrero J.R., Verdú X., Becerra Y., Morancho E. *Sistemas Operativos: Cuaderno de Laboratorio*. Department of Computer Architecture. Polytechnic University of Catalonia. ISBN 978-84-612-1002-2. 2007.

Awards

Best *ISMIR* Poster Presentation

- Best poster presentation at the 15th International Society for Music Information Retrieval Conference for the paper: `mir_eval`: A Transparent Implementation of Common MIR Metrics, 2014.

Caja Madrid Fellowship

- Awarded with the *Caja Madrid* Graduate Fellowship Program for the course 2011-2013

Best *SoundCloud* Hack

- Awarded with the best *SoundCloud* hack in the Music Hack Day for the SCREAM-INATOR, New York 2010

La Caixa Fellowship

- Awarded with the *La Caixa* Graduate Fellowship Program for the course 2009-2011

Enderrock Award Nomination

- Nomination to the Best Catalan Album of the Year 2009 with Sargon Vida by Enderrock Magazine

Teaching Experience

New York University, NY USA

Adjunct Teacher for C Programming **September 2013 to January 2015**

- Teaching the main C Programming course and its lab.

New York University, NY USA

Adjunct Teacher for Applications on iOS Platform **May to July 2013**

- Teaching a new course that focuses on the development of applications on the iOS platform (e.g. iPhone), with an emphasis on audio engineering.

New York University, NY USA

Adjunct Teacher for C Programming Lab **September 2011 to January 2013**

- Teaching the lab of Professor Morwaread Farbood's C Programming course.
- One hour and a half of class per week, with 20 students, plus office hours.
- Introductory C course, covering broad material from basic types, loops and recursion, to data structures, different audio libraries and file handlers.

UPC Foundation, Polytechnic University of Catalonia, Barcelona, Spain

Teacher of Web Technologies course **May 2007**

- Teacher of the course *State of the art in Web Technologies*.

Polytechnic University of Catalonia, Barcelona, Spain

Teacher Assistant at DAC **January 2005 to June 2006**

- Teacher assistant for the Operative System courses.
- C developer under GNU/Linux of basic applications for helping the students.
- Computer Architecture Department (DAC).

Professional Experience

Pandora, Oakland, CA, USA

Scientist **September 2015 to Present**

- Research on deep learning for music recommendation systems with the Music Information Retrieval team.
- Leading the deep learning seminars in Pandora.
- Prototyping in Python with TensorFlow.

CAAST - CORD, Beverly Hills, CA, USA

Audio Scientist **May 2015 to August 2015**

- Developing a music analyzer to be included in their iOS and Android tablet ebooks.
- Prototyping in Python with Theano + Lasagne.

Harmonix, Cambridge, MA, USA

Audio Researcher and Engineer **April 2013 to August 2013**

- Developed a music structure analysis algorithm currently included in the Harmonix VR Music game.
- Prototyping in Python, final implementation in C++.

The Echo Nest, Somerville, MA USA

Engineering Intern **May 2012 to August 2012**

- Research on automatically extracting music sections (*e.g.* chorus, verse, bridge).
- Prototyping in Python, final implementation in C++.

Wizdom Music, New City, NY USA

Software Developer **August 2010 to January 2011**

- Implemented Social Features for iOS Applications *MorphWiz* and *SketchWiz*.
- Designing and implementing new music application for iOS to mahs-up and process different samples.

Sonoma Wire Works, Los Altos, CA USA

Engineering Intern **June 2010 to August 2010**

- Designed and implemented a 4 band EQ in Objective-C and C++ for iOS.
- Implemented the import feature for the *FourTracks* iOS application.

Mobivery, Barcelona, Spain

Project Manager and Software Developer **September 2008 to July 2009**

- Developer of commercial applications for iOS such as iBicis, Avisame, Pisos.com, BeeLoop Guides, Dali Softwatches, ...
- Project Manager for the applications Pisos.com and BeeLoop Guides.

Music Technology Group, Pompeu Fabra University, Barcelona, Spain

Engineer and Teacher Assistant **January 2008 to September 2008**

- Working on algorithms in C++ for synthesizing Extreme Vocal effects.
- Designed and implemented a Ground Truth Data Base for Voice.
- Developing in C++ and Python.

Polytechnic University of Catalonia, Barcelona, Spain

Software Developer at LSI **June 2006 to July 2007**

- Developer of the wiki module for Moodle in PHP.
- Languages and Computer Systems department (LSI).

NTE, Lliçà d'Amunt, Barcelona, Spain

Software Developer **June 2004 to December 2004**

- Designed and implemented a WebService in C#.NET for medical applications in Hospitals in Italy.

TECHNICAL SKILLS Languages: Python, C, C++, Spark, SQL, bash scripting, git, hg.

Machine Learning and Deep Learning: Prototyping in Python, typically employing the following modules: TensorFlow, Keras, Numpy, Scipy, Scikit-learn, Pandas, Matplotlib, Jupyter.

Computer Applications: Vim, TEX (LATEX, BIBTEX), most common productivity packages (for Windows, OS X, and GNU/Linux platforms).

Excellent teamwork skills, and ability to learn new languages and/or technologies.

PROJECTS **MSAF**: Open-source Music Structure Analysis Framework written in Python, including most popular music segmentation algorithms (**https://github.com/urinieto/msaf**).

Screaminator: An iOS app that detects and rates "screams".

ReactPad: An iOS Instrument that is based on the ReacTable from the Music Technology Group in Barcelona.

VoxCarina: An iOS App that is half an Ocarina and half a Talk Box.

Growl Hero: Musical game leveraging feature-based scream-detection.

DIANA: Dynamic Interface Audio and Noise Analyzer.

Gesture Guitar: A Gesture Enhanced Guitar with an Accelerometer and PD Patches developed at the MTG, Barcelona 2008

OTHER ACTIVITIES Lead vocalist of the metal band Arkaen, from Concord, California, since 2016. One EP published.

Vocalist, guitarist, violinist, and iPad player of the Catalan band La Bossa d'Urina since 2011. One album and two singles published in 2015 with Cydonia Records.

Teacher of the Ultimate Lessons to learn how to Scream on-line.

Member of the iPhone Orchestra at Stanford and the Stanford Laptop Orchestra (2009-2010).

Lead vocalist, guitarist, and violin player of the Barcelona metal band Sargon (1998-2009). Two albums, one EP, and one DVD released with two different record labels.

Violin player for Catalan pop rock band Madee (2007-2009).

Eight years of music theory studies in the Conservatory of Granollers (Barcelona), specialized in violin and classical guitar.