

## Zafar Rafii

Gracernote  
Media Technology Lab  
2000 Powell Street, Suite 1500, Emeryville, CA 94608, USA  
+1 (773) 782-5153  
[zrafii@gracernote.com](mailto:zrafii@gracernote.com)  
[zafarrafii@u.northwestern.edu](mailto:zafarrafii@u.northwestern.edu)  
<http://www.cs.northwestern.edu/~zra446/>

### EDUCATION

- 2008-2014** PhD in Computer Science (+ Certificate in Cognitive Science)  
Thesis: "Source Separation by Repetition"  
*Northwestern University, Chicago/Evanston, IL, USA*
- 2005-2006** Master of Science in Electrical Engineering  
*Illinois Institute of Technology, Chicago, IL, USA*
- 2003-2006** Master of Electrical Engineering, Computer Science and Telecommunications  
*Ecole Nationale Supérieure d'Electronique et de ses Applications, Cergy, France*
- 2001-2003** Classes Préparatoires aux Grandes Ecoles, Physics and Engineering Science  
*Jacques Decour, Paris, France*
- 1998-2001** Baccalauréat in Sciences  
*Louis-le-Grand, Paris, France*

### EMPLOYMENT

- 2014-20??** Research Engineer  
*Gracernote, Emeryville, CA, USA*
- 2013** PhD Internship (6 months)  
*Gracernote, Emeryville, CA, USA*
- 2007-2008** Research Engineer (1+ year)  
*Audionamix, Paris Cyber-Village, France*
- 2002-2004** Student Internship (3 months)  
*Dalkia, Paris-la-Defense, France*

### TEACHING

- 2014** *Machine Perception of Music and Audio (course evaluation: 5.4/6)*
- 2012** *Machine Perception of Music and Audio (course evaluation: 5.0/6)*
- 2010** *Introduction to Electrical Engineering (course evaluation: 5.2/6)*

### FELLOWSHIPS

- 2014** *Terminal Year Fellowship*
- 2012** *Advanced Cognitive Science Fellowship for Interdisciplinary Research Projects*
- 2008** *Walter P. Murphy Fellowship*

## PUBLICATIONS

### Patents

- Zafar Rafii and Bryan Pardo. "Acoustic Separation System and Method," US Patent No. 20,130,064,379. 14 March 2013.

### Journal Articles

- Zafar Rafii, Zhiyao Duan, and Bryan Pardo. "Combining Rhythm-based and Pitch-based Methods for Background and Melody Separation," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, 22(12):1884—1893, December 2014.
- Antoine Liutkus, Derry FitzGerald, Zafar Rafii, Bryan Pardo, and Laurent Daudet. "Kernel Additive Models for Source Separation," *IEEE Transactions on Signal Processing*, 62(16):4298—4310, August 2014.
- Zafar Rafii and Bryan Pardo. "REpeating Pattern Extraction Technique (REPET): A Simple Method for Music/Voice Separation," *IEEE Transactions on Audio, Speech, and Language Processing*, 21(1):71—82, January 2013.
- Andrew Todd Sabin, Zafar Rafii, and Bryan Pardo. "Weighting-Function-Based Rapid Mapping of Descriptors to Audio Processing Parameters," *Journal of the Audio Engineering Society*, 59(6):419—430, June 2011.

### Conference Proceedings

- Derry FitzGerald, Antoine Liutkus, Zafar Rafii, Bryan Pardo, and Laurent Daudet. "Harmonic/Percussive Separation using Kernel Additive Modelling," *25<sup>th</sup> IET Irish Signals and Systems Conference*, Limerick, Ireland, June 26-27 2014.
- Zafar Rafii, Bob Coover, and Jinyu Han. "An Audio Fingerprinting System for Live Version Identification using Image Processing Techniques," *39<sup>th</sup> International Conference on Acoustics, Speech and Signal Processing*, Florence, Italy, May 4-9 2014.
- Zafar Rafii, François G. Germain, Dennis L. Sun, and Gautham J. Mysore. "Combining Modeling of Singing Voice and Background Music for Automatic Separation of Musical Mixtures," *14<sup>th</sup> International Society for Music Information Retrieval*, Curitiba, PR, Brazil, November 4-8 2013.
- Zafar Rafii and Bryan Pardo. "Online REPET-SIM for Real-time Speech Enhancement," *38<sup>th</sup> International Conference on Acoustics, Speech and Signal Processing*, Vancouver, BC, Canada, May 26-31 2013.
- Zafar Rafii and Bryan Pardo. "Music/Voice Separation using the Similarity Matrix," *13<sup>th</sup> International Society for Music Information Retrieval*, Porto, Portugal, October 8-12 2012.
- Antoine Liutkus, Zafar Rafii, Roland Badeau, Bryan Pardo, and Gaël Richard. "Adaptive Filtering for Music/Voice Separation Exploiting the Repeating Musical Structure," *37<sup>th</sup> International Conference on Acoustics, Speech and Signal Processing*, Kyoto, Japan, March 25-30 2012.
- Zafar Rafii and Bryan Pardo. "A Simple Music/Voice Separation Method based on the Extraction of the Repeating Musical Structure," *36<sup>th</sup> International Conference on Acoustics, Speech and Signal Processing*, Prague, Czech Republic, May 22-27 2011.
- Zafar Rafii and Bryan Pardo. "Degenerate Unmixing Estimation Technique using the Constant Q Transform," *36<sup>th</sup> International Conference on Acoustics, Speech and Signal Processing*, Prague, Czech Republic, May 22-27 2011.

- Zafar Rafii and Bryan Pardo. "Learning to control a Reverberator using Subjective Perceptual Descriptors," *10<sup>th</sup> International Society for Music Information Retrieval*, Kobe, Japan, October 26-30 2009.

### Workshop Papers

- Antoine Liutkus, Zafar Rafii, Bryan Pardo, Derry FitzGerald, and Laurent Daudet. "Kernel Spectrogram Models for Source Separation," *4<sup>th</sup> Joint Workshop on Hands-free Speech Communication and Microphone Arrays*, Nancy, France, May 12-14 2014.
- Mark Cartwright, Zafar Rafii, Jinyu Han, and Bryan Pardo. "Making Searchable Melodies: Human vs. Machine," *3<sup>rd</sup> Human Computation Workshop*, San Francisco, CA, USA, August 8 2011.
- Zafar Rafii, Raphael Blouet, and Antoine Liutkus. "Discriminant Approach within Non-negative Matrix Factorization for Musical Components Recognition," *DMRN+2: Digital Music Research Network One-day Workshop 2007*, Queen Mary, University of London, UK, December 18 2007.

### Book Chapters

- Bryan Pardo, Zafar Rafii, and Zhiyao Duan. "Audio Source Separation in Musical Context," *Handbook of Systematic Musicology*, Springer. (under review)
- Zafar Rafii, Antoine Liutkus, and Bryan Pardo. "REPET for Background/Foreground Separation in Audio," *Blind Source Separation*, chapter 14, pages 395—411, Springer Berlin Heidelberg, 2014.

### Technical Reports

- Zafar Rafii and Bryan Pardo. "A Digital Reverberator Controlled through Measures of the Reverberation," Northwestern University, EECS Department Technical Report NWU-EECS-09-08, 2009.

## PRESENTATIONS

### Tutorials

- Josh McDermott, Bryan Pardo, and Zafar Rafii. "Leveraging Repetition to Parse the Auditory Scene," *13<sup>th</sup> International Society for Music Information Retrieval*, Porto, Portugal, October 8-12 2012.

### Seminars

- Zafar Rafii. "An Audio Fingerprinting System for Live Version Identification using Image Processing Techniques," *Midwest Music Information Retrieval Gathering*, Evanston, IL, USA, June 14 2014.
- Zafar Rafii. "A Simple Music/Voice Separation Method based on the Extraction of the Underlying Repeating Structure," Telecom ParisTech, Paris, France, July 29 2011.
- Zafar Rafii. "REPET," *Midwest Music Information Retrieval Gathering*, Evanston, IL, USA June 24, 2011.

## REVIEWER

<b>2013-2015</b>	<i>IEEE International Conference on Acoustics, Speech and Signal Processing</i>
<b>2014</b>	<i>European Signal Processing Conference</i>
<b>2014</b>	<i>IEEE Signal Processing Letters</i>
<b>2013-2014</b>	<i>ACM International Conference on Multimedia</i>
<b>2013</b>	<i>International Conference on Digital Audio Effects</i>
<b>2010-2013</b>	<i>IEEE Transactions on Audio, Speech and Language Processing</i>
<b>2009-2014</b>	<i>International Society for Music Information Retrieval</i>

## PERSONAL

### Languages

- English, French (native), German (intermediate), Italian (beginner), Persian (beginner).

### Hobbies

- Bass guitar, biking, cooking, hiking, poetry, running, traveling.

### Traveling

- Andorra, Austria, Belgium, Canada, Czech Republic, France, Germany, Hungary, Italy, Iran, Japan, Malta, Netherlands, Portugal, Spain, United Kingdom, United States.