Zafar Rafii

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EMPLOYMENT

2022-now	Research Scientist	
	Audible Magic, Los Gatos, CA, USA	
2021-2022	Research Engineer Manager	
	Gracenote, Emeryville, CA, USA	
2018-2021	Senior Research Engineer	
	Gracenote, Emeryville, CA, USA	
2014-2017	Research Engineer	
	Gracenote, Emeryville, CA, USA	
2013	PhD Intern (6 months)	
	Gracenote, Emeryville, CA, USA	
2007-2008	Research Engineer (1+ year)	
	Mist Technologies (now Audionamix), Paris, France	
2002-2004	Student Internship (3 months)	
	Dalkia, Paris, France	

EDUCATION

2008-2014	PhD in Electrical Engineering and Computer Science
	Northwestern University, Evanston, IL, USA
	Thesis: Source Separation by Repetition
2008-2011	Certificate in Cognitive Science
	Northwestern University, 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 Preparatoires aux Grandes Ecoles, Physics and Engineering Science
	Jacques Decour, Paris, France
1998-2001	Baccalauréat in Sciences
	Louis-le-Grand, Paris, 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
2008	Walter P. Murphy Fellowship

VOLUNTEERING

Organizer

2015-now	*Bay Innovative Signal Hackers (BISH) Bash meetup*
2015-2017	*Community-based Signal Separation Evaluation Campaign (SiSEC)*

Journal Reviewer

2014-now	*IEEE Signal Processing Letters*
2021	*IEEE Signal Processing Magazine*
2015-2021	*Journal of the Audio Engineering Society (JAES)*
2017-2020	*EURASIP Journal on Audio, Speech, and Music Processing (JASMP)*
2010-2020	*IEEE Transactions on Audio, Speech and Language Processing (TASLP)*
2018	*EURASIP Journal on Advances in Signal Processing (JASP)*
2017	*IEEE Access*

Conference Reviewer

2015-now	*IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*
2014-now	*European Signal Processing Conference (EUSIPCO)*
2013-now	*IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*
2009-now	*International Society for Music Information Retrieval (ISMIR)*
2018	*International Conference on Latent Variable Analysis and Signal Separation (LVA/ICA)*
2013-2016	*ACM International Multimedia Conference*
2013	*International Conference on Digital Audio Effects (DAFx)*

Other

2020-now	*Women in Music Information Retrieval (WiMIR) mentor*
2019-now	*IEEE ICASSP session chair*
2019-now	*IEEE ICASSP reviewer chair*
2017-now	*IEEE Audio and Acoustic Signal Processing Technical Committee member*
2012-now	*IEEE Senior Member*
2021	*IEEE WASPAA industry liaison chair*

PUBLICATIONS

Patents

- Markus Cremer, Robert Coover, Zafar Rafii, Aneesh Vartakavi, Andreas Schmidt, Todd Hodges. "Methods and Apparatus to Control Lighting Effects," 16/698,697, May 2021.
- Zafar Rafii. "Methods and Apparatus to Extract a Pitch-independent Timbre Attribute from a Media Signal," 17/157,780, May 2021.
- Markus Cremer, Zafar Rafii, Robert Coover, and Prem Seetharaman. "Automated Cover Song Identification," 17/065,479, February 2021.
- Zafar Rafii, Markus Cremer, and Bongjun Kim. "Methods, Apparatus and Articles of Manufacture to Identify Sources of Network Streaming Services," 16/984,091, Jan 2021.
- Zafar Rafii. "Methods and Apparatus to Improve Detection of Audio Signatures," 16/455,025, December 2020.
- Zafar Rafii and Prem Seetharaman. "Audio Identification based on Data Structure," 16/927,577, October 2020.
- Zafar Rafii. "Audio Matching based on Harmonogram," 16/913,162, October 2020.
- Zafar Rafii. "Methods and Apparatus to Perform Windowed Sliding Transforms," 15/899,220, July 2020.
- Zafar Rafii, Markus Cremer, and Bongjun Kim. "Methods and Apparatus to Identify Sources of Network Streaming Services using Windowed Sliding Transforms," 16/843,582, July 2020.
- Rober Coover and Zafar Rafii. "Methods and Apparatus to Fingerprint an Audio Signal via Normalization," 16/453,654, March 2020.
- Bryan Pardo and Zafar Rafii. "Audio Separation System and Method," 13/612,413, July 2015.

Journal Articles

- Zafar Rafii. "The Constant-Q Harmonic Coefficients: A Timbre Feature Designed for Music Signals," *IEEE Signal Processing Magazine*, vol. 39, no. 3, May 2022.
- Zafar Rafii. "Sliding Discrete Fourier Transform with Kernel Windowing," *IEEE Signal Processing Magazine*, vol. 35, no. 6, November 2018.
- Zafar Rafii, Antoine Liutkus, Fabian-Robert Stöter, Stylianos Ioannis Mimilakis, Derry FitzGerald, and Bryan Pardo. "An Overview of Lead and Accompaniment Separation in Music," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 26, no. 8, August 2018.
- 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*, vol. 22, no. 12, December 2014.
- Antoine Liutkus, Derry FitzGerald, Zafar Rafii, Bryan Pardo, and Laurent Daudet. "Kernel Additive Models for Source Separation," *IEEE Transactions on Signal Processing,* vol. 62, no. 16, 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*, vol. 21, no. 1, 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*, vol. 59, no. 6, June 2011.

Conference Proceedings
- Aneesh Vartakavi, Amanmeet Garg, and Zafar Rafii. "Audio Summarization for Podcasts," *29th European Signal Processing Conference*, Dublin, Ireland, August 23-27, 2021.
- Bongjun Kim and Zafar Rafii. "Lossy Audio Compression Identification," *26th European Signal Processing Conference*, Rome, Italy, September 3-7, 2018.
- Prem Seetharaman and Zafar Rafii. "Cover Song Identification with 2d Fourier Transform Sequences," *42nd IEEE International Conference on Acoustics, Speech and Signal Processing*, New Orleans, USA, March 5-9, 2017.
- Derry FitzGerald, Zafar Rafii, and Antoine Liutkus. "User Assisted Separation of Repeating Patterns in Time and Frequency using Magnitude Projections," *42nd IEEE International Conference on Acoustics, Speech and Signal Processing*, New Orleans, USA, March 5-9, 2017.
- Antoine Liutkus, Fabian-Robert Stöter, Zafar Rafii, Daichi Kitamura, Bertrand Rivet, Nobutaka Ito, Nobutaka Ono, and Lujie Fontecave. "The 2016 Signal Separation Evaluation Campaign," *13th International Conference on Latent Variable Analysis and Signal Separation*, Grenoble, France, February 21-23, 2017.
- Nobutaka Ono, Zafar Rafii, Daichi Kitamura, Nobutaka Ito, and Antoine Liutkus. "The 2015 Signal Separation Evaluation Campaign," *12th International Conference on Latent Variable Analysis and Signal Separation*, Liberec, Czech Republic, August 25-28, 2015.
- Zafar Rafii, Antoine Liutkus, and Bryan Pardo. "A Simple User Interface System for Recovering Patterns Repeating in Time and Frequency in Mixtures of Sounds," *40th IEEE International Conference on Acoustics, Speech and Signal Processing*, Brisbane, Australia, April 19-24, 2015.
- Antoine Liutkus, Derry FitzGerald, and Zafar Rafii. "Scalable Audio Separation with Light Kernel Additive Modelling," *40th IEEE International Conference on Acoustics, Speech and Signal Processing*, Brisbane, Australia, April 19-24, 2015.
- Derry FitzGerald, Antoine Liutkus, Zafar Rafii, Bryan Pardo, and Laurent Daudet. "Harmonic/Percussive Separation using Kernel Additive Modelling," *25th IET Irish Signals and Systems Conference*, Limerick, Ireland, June 26-27, 2014.
- Antoine Liutkus, Zafar Rafii, Bryan Pardo, Derry FitzGerald, and Laurent Daudet. "Kernel Spectrogram Models for Source Separation," *4th Joint Workshop on Hands-free Speech Communication and Microphone Arrays*, Nancy, France, May 12-14, 2014.

- Zafar Rafii, Bob Coover, and Jinyu Han. "An Audio Fingerprinting System for Live Version Identification using Image Processing Techniques," *39th IEEE 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," *14th International Society for Music Information Retrieval*, Curutiba, PR, Brazil, November 4-8, 2013.
- Zafar Rafii and Bryan Pardo. "Online REPET-SIM for Real-time Speech Enhancement," *38th IEEE 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," *13th 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," *37th IEEE International Conference on Acoustics, Speech and Signal Processing*, Kyoto, Japan, March 25-30, 2012.
- Mark Cartwright, Zafar Rafii, Jinyu Han, and Bryan Pardo. "Making Searchable Melodies: Human vs. Machine," *3rd Human Computation Workshop*, San Francisco, CA, USA, August 8, 2011.
- Zafar Rafii and Bryan Pardo. "A Simple Music/Voice Separation Method based on the Extraction of the Repeating Musical Structure," *36th IEEE 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," *36th IEEE 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," *10th International Society for Music Information Retrieval*, Kobe, Japan, October 26-30, 2009.

Book Chapters
- Bryan Pardo, Zafar Rafii, and Zhiyao Duan. "Audio Source Separation in a Musical Context," *Handbook of Systematic Musicology*, Springer, Berlin, Heidelberg, 2018.
- Zafar Rafii, Antoine Liutkus, and Bryan Pardo. "REPET for Background/Foreground Separation in Audio," *Blind Source Separation*, 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.

Data Sets
- Zafar Rafii, Antoine Liutkus, Fabian-Robert Stöter, Stylianos Ioannis Mimilakis, and Rachel Bittner. "MUSDB18-HQ – an uncompressed version of MUSDB18," https://doi.org/10.5281/zenodo.3338373, 2019.
- Zafar Rafii, Antoine Liutkus, Fabian-Robert Stöter, Stylianos Ioannis Mimilakis, and Rachel Bittner. "The MUSDB18 corpus for music separation," https://doi.org/10.5281/zenodo.1117372, 2017.

PRESENTATIONS

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

Workshops

- Zafar Rafii. "An Audio Fingerprinting System for Live Version Identification using Image Processing Techniques," *Midwest Music Information Retrieval Gathering*, Northwestern University, Evanston, IL, USA, June 14, 2014.
- Zafar Rafii. "REPET," *Midwest Music Information Retrieval Gathering*, Northwestern University, Evanston, IL, USA, June 24, 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, London, UK, December 18, 2007.

Talks
- Zafar Rafii. "Sliding DFT with Kernel Windowing," Tokyo-BISH Bash, Tokyo, Japan, March 30, 2021.
- Zafar Rafii. "Identifying Video Sources by Identifying Audio Compression," Télécom ParisTech, Paris, France, April 13, 2018.
- Zafar Rafii. "Source Separation by Repetition," Center for Computer Research in Music and Acoustics, Stanford University, Stanford, CA, USA, July 15, 2015.
- Zafar Rafii. "Source Separation by Repetition," Center for New Music and Audio Technologies, University of California at Berkeley, Berkeley, CA, USA, May 11, 2015.
- Zafar Rafii. "A Simple Music/Voice Separation Method based on the Extraction of the Underlying Repeating Structure," Télécom ParisTech, Paris, France, July 29, 2011.

Lectures
- Zafar Rafii. "Audio Fingerprinting," EECS 352: Machine Perception of Music and Audio, Northwestern University, 2014.
- Zafar Rafii. "REpeating Pattern Extraction Technique (REPET)," EECS 352: Machine Perception of Music and Audio, Northwestern University, 2014.
- Zafar Rafii. "Rhythm Analysis in Music," EECS 352: Machine Perception of Music and Audio, Northwestern University, 2014.
- Zafar Rafii. "Time-frequency Masking," EECS 352: Machine Perception of Music and Audio, Northwestern University, 2014.

PERSONAL

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

Hobbies
- Baking, bass guitar, biking, brewing, cheesemaking, cooking, eating, reading, running, traveling.

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