

# Prem Seetharaman

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## Education

Northwestern University, Evanston, IL  
09/2019 - PhD, Computer Science  
Committee: Bryan Pardo, Ken Forbus, Oliver Coissart  
Title: “Bootstrapping the Learning Process for Computer Audition”  
  
Northwestern University, Evanston, IL  
BS, Computer Science, Music Composition - 2013

## Professional employment

**Northwestern University, Evanston, IL**  
Teaching Postdoctoral Scholar: 2019 - Present

**Northwestern University, Evanston, IL**  
Doctoral Student in Interactive Audio Lab: 2013 - 2019

**Northwestern University, Evanston, IL**  
Teaching Assistant: 2014 - Present

**Mitsubishi Electric Research Labs, Cambridge, MA**  
Research Intern: 2018

**Adobe Research, San Francisco, CA**  
Research Intern: 2017-2018

**Gracenote, Emeryville, CA**  
Research Intern: 2016

## Publications

### ■ Thesis

- [1] Prem Seetharaman. “Bootstrapping the Learning Process for Computer Audition”. PhD thesis. Northwestern University, 2019.

### ■ Patents

- [1] Markus K Cremer, Zafar Rafii, Robert Coover, and **Prem Seetharaman**. *Automated Cover Song Identification*. US Patent App. 15/698,557. July 2018.
- [2] Zafar Rafii and **Prem Seetharaman**. *Audio Identification Based on Data Structure*. US Patent App. 15/698,532. Mar. 2018.

### ■ Refereed Journal Articles

- [1] Vivian Tang, **Seetharaman, Prem**, Kevin Chao, Bryan Pardo, and Suzan van der Lee. “Automating the Detection of Dynamically Triggered Earthquakes via a Deep Metric Learning Algorithm”. In: *Seismological Research Letters* (to appear) (2019).

- [2] Bryan Pardo, Mark Cartwright, **Seetharaman, Prem**, and Bongjun Kim. “Learning to Build Natural Audio Production Interfaces”. In: *Arts*. Vol. 8. 3. Multidisciplinary Digital Publishing Institute. 2019, p. 110.
- [3] Eric J Humphrey, Sravana Reddy, **Prem Seetharaman**, Aparna Kumar, Rachel M Bittner, Andrew Demetriou, Sankalp Gulati, Andreas Jansson, Tristan Jehan, Bernhard Lehner, et al. “An Introduction to Signal Processing for Singing-Voice Analysis: High Notes in the Effort to Automate the Understanding of Vocals in Music”. In: *IEEE Signal Processing Magazine* 36.1 (2019), pp. 82–94.
- [4] **Prem Seetharaman** and Bryan Pardo. “Audealize: Crowdsourced Audio Production Tools”. In: *Journal of the Audio Engineering Society* 64.9 (2016), pp. 683–695.

## Refereed Conference Papers

- [1] Fatemeh Pishdadian, Bongjun Kim, **Seetharaman, Prem**, and Bryan Pardo. “Classifying Non-Speech Vocals: Deep vs Signal Processing Representations”. In: *Proceedings of DCASE 2019* (2019).
- [2] Ethan Manilow, Gordon Wichern, **Seetharaman, Prem**, and Jonathan Le Roux. “Cutting Music Source Separation Some Slakh: A Dataset to Study the Impact of Training Data Quality and Quantity”. In: *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*. 2019.
- [3] **Seetharaman, Prem**, Gordon Wichern, Jonathan Le Roux, and Bryan Pardo. “Bootstrapping Deep Music Separation from Primitive Auditory Grouping Principles”. In: *arXiv preprint arXiv:1910.11133* (2019).
- [4] Ethan Manilow, **Seetharaman, Prem**, and Bryan Pardo. “Simultaneous Separation and Transcription of Mixtures with Multiple Polyphonic and Percussive Instruments”. In: *arXiv preprint arXiv:1910.12621* (2019).
- [5] Alisa Liu, **Seetharaman, Prem**, and Bryan Pardo. “Model Selection for Deep Audio Source Separation via Clustering Analysis”. In: *arXiv preprint arXiv:1910.12626* (2019).
- [6] **Prem Seetharaman**, Gautham Mysore, Bryan Pardo, Paris Smaragdis, and Celso Gomes. “VoiceAssist: Guiding Users to High-Quality Voice Recordings”. In: *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (SIGCHI)*. ACM. 2019.
- [7] **Prem Seetharaman**, Gordon Wichern, Shrikant Venkataramani, and Jonathan Le Roux. “Class-Conditional Embeddings for Music Source Separation”. In: *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE. 2019.
- [8] **Prem Seetharaman**, Gordon Wichern, Jonathan Le Roux, and Bryan Pardo. “Bootstrapping Single-Channel Source Separation via Unsupervised Spatial Clustering on Stereo Mixtures”. In: *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE. 2019.
- [9] Ethan Manilow, **Prem Seetharaman**, and Bryan Pardo. “The Northwestern University Source Separation Library”. In: *International Society on Music Information Retrieval (ISMIR)*. 2018.
- [10] Julia Wilkins, **Prem Seetharaman**, Alison Wahl, and Bryan Pardo. “VocalSet: A Singing Voice Dataset”. In: *Proceedings of the 19th International Society for Music Information Retrieval Conference (ISMIR)*. 2018.
- [11] **Prem Seetharaman**, Gautham J Mysore, Paris Smaragdis, and Bryan Pardo. “Blind Estimation of the Speech Transmission Index for Speech Quality Prediction”. In: *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018. 2018.
- [12] **Prem Seetharaman**, Fatemeh Pishdadian, and Bryan Pardo. “Music/Voice Separation Using the 2D Fourier Transform”. In: *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*. New Paltz, NY, USA, October 15-18, 2017.
- [13] Ethan Manilow, **Prem Seetharaman**, Fatemeh Pishdadian, and Bryan Pardo. “Predicting Algorithm Efficacy for Adaptive Multi-Cue Source Separation”. In: *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*. New Paltz, NY, USA, October 15-18, 2017 (Finalist for Best Student Paper Award).
- [14] **Prem Seetharaman** and Zafar Rafii. “Cover Song Identification with 2D Fourier Transform Sequences”. In: *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. 2017.
- [15] Taylor Zheng, **Prem Seetharaman**, and Bryan Pardo. “Socialfx: Studying a Crowdsourced Folksonomy of Audio Effects Terms”. In: *Proceedings of the 2016 ACM on Multimedia Conference*. ACM. 2016, pp. 182–186.

- [16] **Prem Seetharaman** and Bryan Pardo. “Simultaneous Separation and Segmentation in Layered Music”. In: *Proceedings of the 17th International Society for Music Information Retrieval Conference (ISMIR)*. 2016, pp. 495–502.
- [17] **Prem Seetharaman** and Bryan Pardo. “Crowdsourcing a Reverberation Descriptor Map”. In: *Proceedings of the 22nd ACM international conference on Multimedia (ACMMM)*. ACM. 2014, pp. 587–596.
- [18] **Prem Seetharaman** and Stephen P Tarzia. “The Hand Clap as an Impulse Source for Measuring Room Acoustics”. In: *Audio Engineering Society Convention 132*. Audio Engineering Society. 2012.

#### ■ Refereed Extended Abstracts

- [1] **Prem Seetharaman** and Bryan Pardo. “Reverbalize: A Crowdsourced Reverberation Controller”. In: *Proceedings of the 22nd ACM international conference on Multimedia (ACMMM)*. ACM. 2014, pp. 739–740.
- [2] Michael Donovan, **Prem Seetharaman**, and Bryan Pardo. “A Web Audio Node for the Fast Creation of Natural Language Interfaces for Audio Production”. In: *Web Audio Conference*. 2017.

#### ■ Non-refereed Abstracts

- [1] Vivian Tang, P Seetharaman, K Chao, BA Pardo, and S van der Lee. “Siamese networks for triggered earthquakes detection”. In: *AGU Fall Meeting Abstracts*. 2018.
- [2] K Chao, P Seetharaman, V Tang, BA Pardo, and S Van der Lee. “Automatic classification of triggered tectonic tremor with deep learning”. In: *AGU Fall Meeting Abstracts*. 2018.

## Service

I regularly review papers for ICASSP, ACM Multimedia, WASPAA, IEEE Transactions on Multimedia, IEEE/ACM Transactions on Audio, Speech, and Language Processing, ISMIR, among other conferences and journals. I helped organize the Midwest Music and Audio Day (MMAD), a workshop for research in my field at Northwestern University, in 2015 and 2017.

### AI Journal Club

Founder and officer

2016 - 2019

AJJC was established to create a venue for open discussion for all topics regarding AI, fostering a sense of community among like-minded researchers at Northwestern.

### CS Phd Advisory Council

Founder

2017 - Present

I helped establish CSPAC, an organization that gives PhD students a voice in decisions made in the department, a sense of ownership and responsibility for the department. CSPAC plans events and fund clubs that foster community and build a department culture.

## References

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Gautham Mysore - gmysore@adobe.com

Zafar Raffi - zrafi@gracenote.com

Paris Smaragdis - paris@illinois.edu

Jonathan Le Roux - leroux@merl.com