

Name: Nicholas J. Bryan

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Web: <https://njb.github.io>

ABOUT

- 9+ years of industry experience in audio research, development, and productization
- 10+ tech transfers, 34+ peer-reviewed papers, 11+ patents, 10+ patents pending

RESEARCH INTERESTS

- Music and audio AI, machine learning (ML), and signal processing (DSP)
- Audio generative models (diffusion, GANs, LLMs), content authenticity

EDUCATION

2014 Ph.D., Computer-based Music Theory and Acoustics, Stanford, GPA 3.94

2011 M.S., Electrical Engineering, Stanford, GPA 3.92

2008 M.A., Music, Science, and Technology, Stanford, GPA 3.92

2007 B.S., Electrical Engineering., U. of Miami-FL, Summa cum laude, GPA 3.95

2007 B.M., Music Eng. Tech., U. of Miami-FL, Summa cum laude, GPA 3.95

WORK EXPERIENCE

- **Adobe Research** (San Francisco, CA).....07/18-Now
 - Music GenTech Lead (01/23 -- Current)
 - Senior Research Scientist II (02/22 – Current)
 - Senior Research Scientist I (07/20 – 02/22)
 - Research Scientist II (07/18 – 07/20)
- **Apple Inc.**, Interactive Media Group (Cupertino, CA).....01/14-07/18
 - Senior Audio Algorithm Engineer (10/16 – 07/18)
 - Audio Algorithm Engineer (01/14 – 10/16)

PREVIOUS WORK EXPERIENCE

- Research Intern, Adobe Research (San Francisco, CA).....06/12-05/13
- Research Intern, Adobe Advanced Technology Labs (San Francisco, CA)....06/11-12/11
- iOS Developer and Consultant, Youth Radio (Oakland, CA).....09/10-09/11
- Software Developer Intern, Smule Inc. (Palo Alto, CA).....06/10-09/10
- Research Intern, Electrical & Comp. Eng.-UM (Coral Gables, FL).....06/07-09/07
- Engineering Intern, Analog Devices Inc. (Wilmington, MA).....05/06-08/06
- Recording Engineer, Recording Services-UM (Coral Gables, FL).....09/03-01/06
- Research Intern, Marine Geology & Geophysics-UM (Virginia Key, FL).....06/05-08/05
- Research Intern, Professional Instruments Co. (St. Louis Park, MN).....06/02-09/02

JOURNAL PUBLICATIONS (PEER-REVIEWED)

5. [Submitted] S-L. Wu, C. Donahue, S. Watanabe, and N. J. Bryan, "Music ControlNet: Multiple Time-varying Controls for Music Generation." *ACM/IEEE Transactions on Audio, Speech, and Language Processing*, 2023.
4. J. Casebeer, N. J. Bryan, P. Smaragdis, "MetaAF: Meta-learning for Adaptive Filtering." *ACM/IEEE Transactions on Audio, Speech, and Language Processing*, 2023.
3. C. J. Steinmetz, N. J. Bryan, J. D. Reiss. "Style Transfer of Audio Effects with Differentiable Signal Processing." *Journal of AES* 2022.
2. Z. Tang, N. J. Bryan, D. Li, T. Langlois, D. Manocha, "Scene-Aware Audio Rendering via Deep Acoustic Analysis." *IEEE VR Journal Papers*, 2020.
1. T. Quirino, M. Kubat, N. J. Bryan. "Instinct-Based Mating in Genetic Algorithms Applied to the Tuning of 1-NN Classifiers." *IEEE Transactions on Knowledge and Data Engineering*. December 2010.

CONFERENCE PUBLICATIONS (PEER-REVIEWED)

31. [Submitted] Casebeer, N. J. Bryan, P. Smaragdis, "Scaling Up Adaptive Filter Optimizers." *IEEE Int. Conference on Acoustics, Speech, and Signal Processing*, 2024.
30. J. Wu, J. Casebeer, N. J. Bryan, P. Smaragdis, "Meta-learning for Adaptive Filters with Higher-order Frequency Dependencies." *IEEE International Workshop on Acoustic Signal Enhancement (IWEANC)*, 2022.
29. H. Yang, S. Firodiya, N. J. Bryan, M. Kim. "Don't Separate, Learn to Remix: End-to-End Neural Remixing with Joint Optimization," *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*, 2022.
28. M. Won, J. Salamon, N. J. Bryan, G. J. Mysore, X. Serra, "Emotion Embedding Spaces for Matching Music to Stories." *International Society for Music Information Retrieval Conference (ISMIR)*. Online, 2021. **(Best student paper award)**
27. J. Salamon, O. Nieto, N. J. Bryan. "Deep Embeddings and Section Fusion Improve Music Segmentation." *Int. Society for Music Info. Retrieval Conf. (ISMIR)*, 2021.
26. Y. Wang, N. J. Bryan, J. Salamon, M. Cartwright, J. P. Bello. "Who Calls the Shots? Rethinking Few-Shot Learning for Audio." *IEEE Workshop on Applications of Signal Proc. to Audio and Acoustics (WASPAA)*, 2021. **(IEEE Special best paper award).**
25. J. Casebeer, N. J. Bryan, P. Smaragdis. "Auto-DSP: Learning to Optimize Acoustic Echo Cancellers." *IEEE Workshop on App. of Sig. Proc. to Audio and Acoustics*, 2021.
24. M. A. Martínez Ramírez, O. Wang, P. Smaragdis, N. J. Bryan. "Differentiable Signal Processing with Black-Box Audio Effects." *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2021.
23. Y. Wang, N. J. Bryan, M. Cartwright, J. P. Bello, J. Salamon. "Few-shot Continual Learning for Audio Classification." *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2021.

22. M. Morrison, L. Rencker, Z. Jin, N. J. Bryan, J.-P. Caceres, B. Pardo. "Context-aware Prosody Correction for Text-based Speech Editing." *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2021.
21. P. Manocha, A. Finkelstein, Z. Jin, R. Zhang, N. J. Bryan, G. J. Mysore. "A Differentiable Perceptual Audio Metric Learned from Just Noticeable Differences." In *Interspeech*, 2020. **(Best student paper finalist)**
20. M. Morrison, Z. Jin, J. Salamon, N. J. Bryan, G. J. Mysore. "Controllable Neural Prosody Synthesis." In *Interspeech*, 2020.
19. J. Lee, N. J. Bryan, J. Salamon, Z. Jin, J. Nam. "Metric Learning vs Classification for Disentangled Music Representation Learning." In *International Society for Music Information Retrieval*, 2020.
18. Y. Wang, J. Salamon, M. Cartwright, N. J. Bryan, J. P. Bello. "Few-shot Drum Transcription in Polyphonic Music." In *International Society for Music Information Retrieval*, 2020.
17. J. Lee, N. J. Bryan, J. Salamon, Z. Jin, J. Nam. "Disentangled Multidimensional Metric Learning for Music Similarity." In *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2020.
16. Y. Wang, J. Salamon, N. J. Bryan, J.-P. Bello. "Few-Shot Sound Event Detection." In *IEEE Int. Conference on Acoustics, Speech, and Signal Processing*, 2020. **(Press)**
15. S. I. Mimilakis, N. J. Bryan, P. Smaragdis. "One-Shot Parametric Audio Production Style Transfer with Application to Frequency Equalization." In *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2020.
14. N. J. Bryan. "Impulse Response Data Augmentation and Deep Neural Networks for Blind Room Acoustic Parameter Estimation." In *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2020.
13. N. J. Bryan, G. J. Mysore, G. Wang. "ISSE: An Interactive Source Separation Editor." In *Conference on Human Factors in Computing Systems*. April 2014.
12. N. J. Bryan. "Interactive Sound Source Separation." *Ph.D. Thesis*, Stanford University, 2014. **Audio Eng. Society Graduate Student Design Gold Award (2013).**
11. N. J. Bryan, G. J. Mysore, G. Wang. "Source Separation of Polyphonic Music with Interactive User-Feedback on a Piano-Roll Display." In *International Society for Music Information Retrieval Conference*. November 2013.
10. N. J. Bryan, G. J. Mysore. "An Efficient Posterior Regularized Latent Variable Model for Interactive Sound Source Separation." In *International Conference on Machine Learning*. May 2013.
9. N. J. Bryan, G. J. Mysore. "Interactive Refinement of Supervised and Semi-Supervised Sound Source Separation Estimates." In *IEEE International Conference on Acoustics, Speech, and Signal Processing*. May 2013.
8. N. J. Bryan, J. Herrera, G. Wang. "User-Guided Variable-Rate Time-Stretching Via Stiffness Control." In *International Conf. on Digital Audio Effects*. September 2012.

7. N. J. Bryan, P. Smaragdis, G. J. Mysore. "Clustering and Synchronizing Multi-Camera Video via Landmark Cross-Correlation." In *IEEE International Conference on Acoustics, Speech, and Signal Processing*. March 2012.
6. N. J. Bryan, G. Wang. "Musical Influence Network Analysis and Rank of Sample-Based Music." In *International Society for Music Information Retrieval Conf.* October 2011.
5. N. J. Bryan, G. Wang. "Two Turntables and a Mobile Phone." In *International Conference on New Interfaces for Musical Expression*. May 2011. **(Press)**
4. K. Lee, N. J. Bryan, J. S. Abel. "Approximating Measured Reverberation Using A Hybrid Fixed/Switched Convolution Structure." In *International Conference on Digital Audio Effects*. October 2010.
3. N. J. Bryan, J. Herrera, J. Oh, G. Wang. "MoMu: A Mobile Music Toolkit." In *International Conf. on New Interfaces for Musical Expression*. June 2010. **(Press)**
2. J. Oh, J. Herrera, N. J. Bryan, G. Wang. "Evolving The Mobile Phone Orchestra." In *International Conference on New Interfaces for Musical Expression*. June 2010.
1. G. Wang, N. Bryan, J. Oh, R. Hamilton. "Stanford Laptop Orchestra (SLORK)." In *International Computer Music Conference*. August 2009. **(Press)**

OTHER PUBLICATIONS

6. M. Morrison, Z. Jin, N. J. Bryan, J.-P. Caceres, B. Pardo, "Neural Pitch-Shifting and Time-Stretching with Controllable LPCNET." arXiv, 2021.
5. N. J. Bryan, G. J. Mysore. "Interactive User-Feedback for Sound Source Separation." *International Conference on Intelligent User-Interfaces (IUI) Workshop on Interactive Machine Learning (Extended Abstract/Workshop Paper)*. March 2013.
4. J. S. Abel, N. J. Bryan, T. Skare, M. Kolar, P. Huang, D. Mostowfi, J. O. Smith III. "A Configurable Microphone Array with Acoustically Transparent Omnidirectional Elements." In *Audio Engineering Society Convention*. October 2009.
3. N. J. Bryan, M. A. Kolar, J. S. Abel. "Impulse Response Measurements in the Presence of Clock Drift." In *Audio Engineering Society Convention*. November 2010.
2. N. J. Bryan, J. S. Abel. "Methods For Extending Room Impulse Responses Beyond Their Noise Floor." In *Audio Engineering Society Convention*. November 2010.
1. J. S. Abel, N. J. Bryan, et al. "On Estimating Room Impulse Responses from Recorded Balloon Pops." In *Audio Eng. Society Convention*. November 2010.

ACADEMIC AWARDS

- Best Student Paper Award (mentor), ISMIR, 2021.
- IEEE Best Audio Few-shot Learning Paper, IEEE WASPAA, 2021.
- Best Student Paper Finalist, Interspeech, 2020.
- Best Reviewer Award, ISMIR, 2020.

- Gold Award, AES Graduate Student Design, 2013.
- U of Miami-FL, Summa cum laude honors, General honors, Dept. of EE honors 2007.
- U of Miami-FL, Tzay Y. Young Best EE Senior Design Award, U of Miami-FL, 2007.
- U of Miami-FL, Research & Creativity Fair, Undergrad 2nd Place Winner, 2006.

OPEN-SOURCE SOFTWARE

- **ConvMelspec** – Convertible Melspectrograms via 1D Convolutions (<https://github.com/adobe-research/convmelspec>), released 2022.
- **MetaAF** – Control adaptive filters with neural networks (<https://github.com/adobe-research/MetaAF>), released 2022.
- **DeepAFx-ST** – Style transfer of audio effects with differentiable signal processing (<https://github.com/adobe-research/DeepAFx-ST>), released 2022.
- **DeepAFx** – Third-party audio effects plugins as differentiable layers within deep neural networks (<https://github.com/adobe-research/DeepAFx>), released 2021.
- **ISSE** – Cross-platform interactive source separation editor via drawing and painting (<http://isse.sourceforge.net>). 82,000+ downloads, 120+ countries. released 2013.

PATENTS SUBMITTED

- J. Salamon, J.-P. Caceres, G. Zhu, N. J. Bryan. “A Pipeline for Filler Word Detection and Classification.” Submitted by Adobe, August 2022.
- N. J. Bryan, P. Smaragdis. “Method for Learning to Optimize Signal Processing Algorithms.” Submitted by Adobe, April 2022.
- J. Salamon, O. Nieto, N. J. Bryan, “Multi-Level Audio Segmentation Using Deep Embeddings.” Submitted by Adobe, Oct. 2022.
- N. J. Bryan and J. Salamon, “Section-Based Music Similarity Searching.” Submitted by Adobe, Oct. 2022.
- M. Morrison, Z. Jin, J. P. Caceres, N. J. Bryan, B. Pardo, “Neural Pitch-Shifting and Time-Stretching”, Submitted by Adobe, Nov. 2021.
- M. Morrison, Z. Jin, J. P. Caceres, N. J. Bryan, B. Pardo, “Context-Aware Prosody Correction of Edited Speech”, Submitted by Adobe, Nov. 2021.
- M. Martínez, N. J. Bryan, O. Wang, P. Smaragdis, “Deep Encoder for Performing Audio Processing”, April 2021.

PATENTS ISSUED

- J. Lee, N. J. Bryan, J. Salamon, Z. Jin, “Searching for Music.” Adobe, March 2020.
- N. J. Bryan. “Improving Voice Recordings Using Acoustic Quality Measurement Models and Actionable Acoustic Improvement Suggestions.” Adobe, October 2019.

- J. Salamon, Y. Wang, N. J. Bryan, “Automated Sound Matching Within an Audio Recording.” Adobe, November 2019.
- N. J. Bryan, Q. Yang, V. Iyengar, “Mitigating Noise in Audio Signals”. Apple, Sept. 2021.
- S. I. Mimitakis, N. J. Bryan, P. Smaragdis, “Audio Prod. Assistant for Style Transfers of Audio Recordings Using One-Shot Parametric Predictions”, Adobe, Aug. 2021.
- D. Li, Z. Tang, T. Langlois, N. J. Bryan. “Rendering Scene-Aware Audio Using Neural Network-Based Acoustic Analysis.” Adobe, November 2021.
- N. J. Bryan. “Generating Synthetic Acoustic Impulse Responses from an Acoustic Impulse Response.” US11,074,925, Adobe, July 2021.
- N. J. Bryan, V. Iyengar, “Speech Enhancement for an Electronic Device.” US20190272842, Apple. January 2020.
- N. J. Bryan, V. Iyengar, A. Lindahl, “Transparent Near-End User Control Over Far-End Speech Enhancement Processing”, US20190156847A1, Apple. March 2019.
- N. J. Bryan, V. Iyengar, “System and Method of Noise Reduction for Mobile Device.” US20180350381A1. Apple. April 2019
- N. J. Bryan, P. Smaragdis, G. J. Mysore, “Clustering and Synchronizing Content.” US8924345B2, Adobe. December 2014.

TECHNOLOGY TRANSFERS

- Adobe Technologies
 - Filler Word Removal (consult) – [Premiere Pro](#), 2023.
 - Convertible Melspectrograms (lead) – [Premiere Pro](#), 2023.
 - Voice Activity Detection (consult) – [Premiere Pro](#), 2023.
 - AutoTone Lumetri Color (consult) – [Premiere Pro](#), 2022.
 - AudioTagger (co-lead research) – [Adobe Project Blink](#), 2022.
 - MicCheck (lead) – [Adobe Podcast](#), 2022.
 - Find Similar Audio (co-lead research, lead engineering) – [Adobe Stock](#), 2021.
 - Sensei Toolkit (lead) – [Sensei Machine Learning Platform](#), 2020.
 - Merge Clips (lead) – [Premiere Pro](#), 2013.
- Adobe Internal Awards
 - Adobe Intern Showcase 1st Prize (Mentor), 2023.
 - SoundSeek – Adobe MAX Sneak Research Co-Lead, 2019.
 - AudioLayers – Adobe MAX Sneak Research Lead, 2013
 - Auto Sync. of Videos” – Adobe MAX Sneak Research Lead 2011.
- Apple – See four patents on single & multi-channel speech enhancement, 2014-2018.

ACADEMIC COMMITTEES

- IEEE ICASSP 2024 Area Co-Chair– Music Signal Analysis, Processing, and Synthesis
- IEEE AASP TC – EDICS Vice-Chair
- IEEE WASPAA 2023 General Co-Chair
 - Co-led review process transition from single- to double-blind
 - Co-led 2-3x increase in corporate sponsorship donations
 - Co-led 10x increase in student travel grants
 - Co-led first individual donation campaign w/IEEE Foundation
 - Co-led 2-2.5x increase in student attendance at WASPAA
- IEEE ICASSP 2023 Area Chair – Music Signal Analysis, Processing, and Synthesis
- IEEE Audio and Acoustic Signal Processing (AASP) Technical Committee (2023-2025)
- ISMIR 2022 Program Committee
- IEEE ICASSP 2022 Area Chair – Music Signal Analysis, Processing, and Synthesis
- ISMIR 2021 Program Committee
- IEEE WASPAA 2021 Area Chair – Music Signal Analysis, Processing, and Synthesis
- IEEE ICASSP 2021 AASP – Deep Learning for Music Signal Processing Session Chair
- IEEE ICASSP 2021 AASP – Music Signal Analysis, Processing & Synthesis Area Chair
- IEEE ICASSP 2020 AASP – Music Information Retrieval Session Chair
- IEEE Audio and Acoustic Signal Processing (AASP) Technical Committee (2020-2022)

PHD THESIS COMMITTEES

- Jonah Casebeer – University of Illinois Urbana-Champaign, 2023
- Yu Wang – New York University, 2023
- Jongpil Lee – Korea Advanced Institute for Science and Technology, 2020

ACADEMIC REVIEWING

- 2024 – ICASSP AASP meta reviews (5)
- 2023 – ICASSP AASP meta reviews (38)
- 2022 – ICASSP AASP meta reviews (41), IEEE SPL (1), IEEE TASLP (3)
- 2021 – ICASSP AASP meta reviews (24), WASPAA meta reviews (12), IEEE TASLP (2), ISMIR meta + reviews (3), Pattern Recognition (1)
- 2020 – ICASSP (12), SIGGRAPH (1), IEEE TASLP (3), ISMIR (4, **Best Reviewer**)

- 2019 – ICASSP (10), WASPAA (6), IEEE TSP (1), IEEE SPL (1), Stanford HAI Blog (1)
- 2018 – ICASSP (3), EUSIPCO (5), NIME
- 2017 – ICASSP, WASPAA, EUSIPCO, ACM Trans. on Interactive Int. Systems, NIME
- 2016 – ICASSP, WASPAA, EUSIPCO, ACM Trans. on Interactive Int. Systems, NIME
- 2015 – ICASSP, WASPAA, EUSIPCO, JASA, NIME, IEEE Journal Topics Signal Proc.
- 2014 – ICASSP, Elsevier Signal Processing, NIPS, NIME, Computer Communications
- 2013 – NIME
- 2012 – NIME

SELECTED PRESS

- “MAX Sneaks – SoundSeek.” (11/19).
<https://www.youtube.com/watch?v=ebAlnW3Xs2k>
- “Audio Layers.” Adobe TV (05/13).
http://www.youtube.com/watch?feature=player_embedded&v=nyODK-J9keo
- “Automatic Synchronization of Crowd Sourced Videos.” Adobe TV (10/11).
<https://www.youtube.com/watch?v=dhyvzOJBhzc>
- “Smartphone turntables put new spin on DJing.” NewScientist (05/11).
<https://tinyurl.com/newscientist-mophodj>
- “Air Instruments only.” *The Stanford Daily* (10/10).
<http://www.stanforddaily.com/2010/10/28/air-instruments-only>
- “From Pocket to Stage, Music in the Key of iPhone.” NY Times (*Front Page* 12/04/09).
http://www.nytimes.com/2009/12/05/technology/05orchestra.html?_r=2&hpw
- “Make-TV: Computer Making Music (Episode 9).” PBS (02/09).
<https://www.youtube.com/watch?v=R2OF2OLaHdw>
- “Stanford Students invent new music.” Local ABC TV (SF), Drive to Discover (04/08).
http://abclocal.go.com/kgof/story?section=news/drive_to_discover&id=6064990
- “Rhythm and Cubes.” Stanford Magazine (07/08).
<http://www.stanfordalumni.org/news/magazine/2008/julaug/red/cubeats.html>

TEACHING AND MENTORING

- Mentored or co-mentored the following interns at Adobe Research:
 - Zachary Novack – University of California San Diego
 - Ge Zhu (2023) – University of Rochester
 - Shih-Lun Wu (2023) – Carnegie Mellon University
 - Jonah Casebeer (2020-2022) – University of Illinois Urbana-Champaign
 - Christian Steinmetz (2021, 2022) – Queen Mary University of London

- Jack Atherton (2021) – Stanford University
- Gabriel Zalles (2021) – University of California San Diego
- Amber Blue (2021) – Georgia Tech
- Minz Won (2020-2021) – Universitat Pompeu Fabra
- Marco Antonio Martínez Ramírez (2020) – Queen Mary University of London
- Yu Wang (2019-2021) – New York University
- Jongpil Lee (2019-2020) – Korea Advanced Institute for Science and Technology
- Stylianos Mimilakis (2019) – Technical University of Ilmenau
- Lucas Rencker (2019) – University of Surrey
- Zhenyu Tang (2019) – University of Maryland
- Maxwell Morrison (2019-2021) – Northwestern University
- Teaching Assistant, Stanford University (Ave. 4.7/5.0 rating)
 - Audio Applications of the Fast Fourier Transform.....Spring 2011
 - Compositional Algorithms, Psychoacoustics, and Spatial Processing ... Winter 2011
 - Music, Computing, and Design IFall 2010
 - Digital Audio EffectsSpring 2010
 - Music, Computing, and Design IIWinter 2010
 - Introduction to Digital Audio Signal ProcessingFall 2009

SELECTED TALKS & WORKSHOPS

- “Learning to Control Signal Processing Algorithms with Deep Learning”, *Women in Music Information Retrieval Workshop*, 2021.
- “ISSE: An Interactive Machine Learning Workflow.” (Workshop Demo) *NIPS Workshop on Machine Learning Open-Source Software*. December 2013.
- “ISSE: An Interactive Source Separation Editor.” (Two-part Talk) *CCRMA DSP Seminar*, Stanford University. October and November 2013.
- “Audio Source Separation.” (Workshop Speaker w/Gautham J. Mysore, Pierre Leveau, Derry FitzGerald, Elias Kokkinis), *Audio Eng. Society Convention*. October 2013.
- “Source Separation Tutorial Mini-Series.” (Three-part Talk w/Dennis Sun and Eunjoon Cho) *CCRMA DSP Seminar*, Stanford University, April 2013.
- “User-Guided Variable-Rate Time-Stretching Via Stiffness Control.” (Talk) *CCRMA DSP Seminar*, Stanford University. November 2012.
- “Reinventing Musical Instruments.” *Brains and Beakers Seminar* (Talk w/Nick Kruge), Youth Radio, Oakland, CA. December 2010.
- “Graduate School Perspectives for Music Engineering Students.” (Talk w/Kurt

Jacobson & Becky Stewart) *Music Eng. Forum*, University of Miami-FL. October 2011.

- “Mobile Music Design and Programming.” (Workshop speaker w/Jorge Herrera, Jieun Oh, Ge Wang). *New Interfaces for Music Expression*. June 2010.

REFERENCES

- Available upon request