

ANDY M. SARROFF

CURRICULUM VITAE

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EDUCATION

2010-Present

Dartmouth College, Hanover, NH
PhD student, Computer Science Department
Advisor: Michael Casey

2010-2011

Dartmouth College, Hanover, NH
Masters student, Computer Science Department
Advisors: Tanzeem Choudhury and Andrew Campbell

2006-2009

New York University, New York City, Master of Music
Music Technology Program
Thesis Title: "Spaciousness in recorded music: Human Perception,
objective measurement, and machine prediction"
Thesis Advisor: Juan P. Bello
GPA: 3.89 / 4.00

1996-2000

Wesleyan University, Middletown, CT, Bachelor of Arts in Music

SPONSORSHIP, HONORS AND AWARDS

2011-2012	Neukom Institute for Computational Research, Graduate Fellowship Fellowships awarded yearly for interdisciplinary computational research.
2011-2012	Google Faculty Research Reward Awarded to Michael Casey, supporting current research activity.
May, 2009	Music Technology Student-of-the-Year Award Awarded once a year to one student by the New York University Music Technology program for "outstanding achievement and citizenship."
May, 2008	Dean's Grant to Support Graduate Student Research Competitive 1-year grant awarded by the Steinhardt School to outstanding students for sponsored research.

MASTER'S THESIS ABSTRACT

Spaciousness in Recorded Music: Human Perception, Objective Measurement, and Machine Prediction

MM Thesis, 2009/05/05

Recording engineers and music producers are tasked with transferring musical expression to a static medium. Furnished with expert knowledge of music theory, acoustics, and signal processing technology, they optimize this process to elicit and manipulate desirable musical impressions from listeners. One such impression is auditory spaciousness, the artful handling of which creates enjoyable experiences for the listener.

This work presents a complete system for retrieving a stream of perceptually meaningful information—spaciousness—from its digital recording. It presents the results of a human subject study showing that humans perceive spaciousness of music recordings in a consistent fashion. It introduces and validates two new signal analysis techniques to measure spatial information in recorded music. And it demonstrates a means of mapping subjective experience to objective measurements of musical recordings using exemplar-based machine learning methods.

RESEARCH INTERESTS

GENERATIVE MODELING OF SPATIAL ATTRIBUTES

Recorded music communicates auditory scenes to a listener. These give him or her information about the context of the performers—what kind of space the performers are in, and what their positions are relative to each other and to the performing space. I am interested in building a framework for transforming an existing musical signal and its auditory scenes into a new one, with entirely new relationships. The goal is to develop a model which can generate a transformed feature space and use feature synthesis to engineer music with new spatial representation. A research proposal can be downloaded from <http://www.cs.dartmouth.edu/~sarroff/assets/documents/Sarroff-research-proposal-2010.pdf>.

COMPUTATIONAL PERCEPTION OF MUSIC

I am interested in the automated perception of musical attributes that are related to the music engineering process. For example, the spatial properties of musical audio mentioned above, in which perceived envelopment, room size, and source placement are manipulated; or, the “comping” of several vocal recordings into a single recording.

ADAPTIVE MODELING

The Music Information Retrieval community often refers to a “glass ceiling” for recommendation accuracy in retrieval tasks. However, increased user adaptation and machine contextualization may help achieve better results. For instance, perhaps an environmentally aware laptop can make better music recommendations to a listener than current systems.

RESEARCH EXPERIENCE

2010-2011

Drs. Tanzeem Choudhury and Andrew Campbell, Dartmouth College, supervised research for credit.

Health related inference through speech analysis on mobile phones.

January-July,
2010

Dr. Ye Wang, Computer Science Department, School of Computing, National University of Singapore, Research Assistantship

Large-scale search and retrieval of music content; music information retrieval for health related applications.

Academic Years,
2008-2009 &
2007-2008

Dr. Juan P. Bello, New York University, Research Assistantship
Machine Listening on the Studio (funded by the Steinhardt Technology Award); objective signal measurements for spaciousness in musical audio; predictive modeling of music perception.

WORK EXPERIENCE

OCCUPATIONS

2009

Sourcetone, LLC, New York

Title: Music Analysis, Classification Research, and Product Development

Research in Music Emotion Recognition, including machine learning, classification, and signal analysis.

INTERNSHIPS

Summer, 2011

Gracernote, Inc., Music Technology Lab, Emeryville, CA

Title: Research Intern

Source and location invariant characterization of reverberant environments.

Summer, 2008

Sennheiser Electronic Corporation, R&D USA, Palo Alto, CA

Title: Audio DSP Engineer

Development and implementation of a methodology for the objective evaluation of a new microphone.

Summer, 2008

AuSIM, Inc., Palo Alto, CA

Title: Engineer

Calibration assistance for the AuSim "Vectsonic" system for the External Effects Room at NASA Langley Research Laboratory in Hampton, VA. Testing and troubleshooting of a wearable communication system "3DVx" and its components, including WiFi radios, orientation trackers, GPS, touch displays, and auditory displays.

Summer, 2007

AuSIM, Inc., Palo Alto, CA

Title: Engineer

Development for audio and acoustics products delivered to the U. S. Army Research Lab (ARL) in Aberdeen, MD and McGill University. These included system configuration and interface development for a 5-room laboratory at ARL's Environment for Auditory Research (EAR) facility, and interface design for a robotic acoustic capture microphone array commissioned by McGill University.

TEACHING EXPERIENCE

January-July,
2010

Teaching Assistant, Computer Science Department, School of Computing, National University of Singapore

Designed and taught 3.5 lectures for a new module, "Sound and Music Computing." Assisted Dr. Ye Wang in all other matters related to the class (grading, labs, mentoring, etc.).

Academic Year,
2008-2009

Music Department Tutor, New York University, Music Technology Program

Trained students in Matlab programming; digital signal theory and processing; and Music Information Retrieval.

PAPERS, PUBLISHED AND SUBMITTED

Sarroff, A. M. and Bello, J. P. Toward a Computational Model of Perceived Spaciousness in recorded Music. *The Journal of the Audio Engineering Society*, vol. 59 no.7/8, pp. 498-513, 2011.

Miluzzo, E., Papandrea, M., Lane, N., Sarroff, A. M., Giordano, S. and Campbell, A. T. Tapping the Vibe of a City with VibN, a Continuous Sensing Application for Smartphones. *The Ninth International Conference on Mobile Systems, Applications, and Services (MobiSys '11)*. Submitted December 2010.

Zhao, Z., Wang, X., Xiang, Q., Sarroff, A. M., Li, Z. and Wang, Y. Large-scale music tag recommendation with explicit multiple attributes. In *Proceedings of ACM Multimedia 2010*, Firenze, Italy. October 2010.

Sarroff, A. M. and Bello, J. P. Predicting the Perceived Spaciousness of Stereophonic music Recordings. In *Proceedings of the Sixth Sound and Music Computing Conference (SMC-09)*, Porto, Portugal. July 2009.

Sarroff, A. M. and Bello, J. P. Measurements of Spaciousness for Stereophonic Music. In *Proceedings of the One-Hundred-Twenty-fifth Convention of the Audio Engineering Society*, San Francisco, USA. October 2008.

PRESENTATIONS

Sourcetone: An Automated Music Emotion Recognition System. Poster presentation. Tenth International Society for Music Information Retrieval Conference, Kobe, Japan. October 2009.

Subjective Evaluation of Spatial Impression in Reproduced Stereophonic Music. Oral presentation. Dean's Grant for Graduate Student Research Colloquium, New York University, NY. October 2009.

Predicting the Perceived Spaciousness of Stereophonic music Recordings. Oral presentation. Sixth Sound and Music Computing Conference (SMC-09), Porto, Portugal. July 2009.

Measurements of Spaciousness for Stereophonic Music. Poster presentation. One-Hundred-Twenty-fifth Convention of the Audio Engineering Society, San Francisco, USA. October 2008.

SERVICE

PEER REVIEW

Computer Music Journal, referee.

ACM Transactions on Multimedia Computing, Communications, and Applications, sub-referee.

ACM Multimedia 2010 International Conference, sub-referee.

AFFILIATIONS AND LEADERSHIP POSITIONS

NYU Music Technology Research Group

Student coordinator and event planner for weekly seminars and student forums, 2007-2009.

NYU Music and Audio Research Laboratory (MARL)

Weekly research meetings and collaborations.

New England Music Information Special Interest Group

Student member.

Audio Engineering Society

Student member.

SKILLS

Computing Languages

Java; Python; C++; Perl; Lush; Matlab

Relational Databases

MYSQL

Web

HTTP; CSS; PHP; JavaScript

Machine Learning

RapidMiner; Weka; BNT

ADDITIONAL INFORMATION

RECORDING AND MIXING

I produced music for several years in New York City. I began by working for Greene Street Recording. I worked briefly at Mission Sound Recording and Loho Studios in 2001, before moving to RPM Electronic Sound Studios, where I soon became Chief Engineer. Toward the beginning of 2004, I opened a production facility. Working under the name Woodshop Sound, I recorded, mixed, and mastered albums until 2007.

My professional experience in music continues to inform my work as a researcher. To this day, I am very interested in modeling the perceived attributes of production in recorded music.

PERCUSSION

I have played drums in several bands, releasing two recordings. At Wesleyan University, I studied Samba percussion; South Indian Mridangam and vocal percussion (solkattu); Javanese gamelan; and vibraphone.

REFERENCES

Provided upon request.