

JENNIFER HSU

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RESEARCH INTERESTS

- Design and implementation of music production and composition applications
 - Analysis and synthesis of percussive sounds
 - Statistical analysis and transformation of rhythmic patterns in musical audio
 - Digital audio signal processing and digital audio effects
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EDUCATION

Doctor of Philosophy in Computer Music

University of California, San Diego

La Jolla, CA / Sept 2013 - present

Master of Arts in Music, Science, and Technology

Stanford University

Stanford, CA / Sept 2011 - June 2013

Bachelor of Arts in Computer Science and

Bachelor of Arts in Cognitive Science

University of California, Berkeley

Berkeley, CA / Aug 2007 - May 2011

EMPLOYMENT

Graduate Student Researcher

UC San Diego, Department of Music

La Jolla, CA // Jan 2017 - present

Supervisor: Tamara Smyth

Research techniques to implement a real-time, parametric 2-D mesh with application for an interactive percussion instrument.

EMPLOYMENT

Research Intern

Ossic, Engineering Group

San Diego, CA // June - Sept 2017; June - Sept 2016

Supervisor: Joy Lyons

Develop algorithms to personalize head-related transfer functions (HRTFs) for spatial audio.

Research Assistant

Center for Research and Learning (CREL), UC San Diego

La Jolla, CA // Sept - Dec 2016 ; Sept 2014 - June 2015

Supervisor: Shlomo Dubnov

- Develop algorithms to synthesize music from semantic emotional descriptors.
- Explore techniques to identify repeated musical patterns.
- Research guided and structured musical improvisation.

Research Assistant

Immersive Lab Project, UC San Diego, Department of Music

La Jolla, CA // Sept - Dec 2015

Supervisor: Katharina Rosenberger

- Resolve issues involving panoramic video, spatial audio, and touch interaction in the Immersive Lab media space.
- Assist students with software issues in Pd and Max/MSP

Research Intern

Gracenote, Media Technology Lab

Emeryville, CA // June - Sept 2015

Supervisor: Gregoire Tronel and Phillip Popp

Develop a downbeat estimation algorithm using machine learning techniques.

Research Intern

Jawbone, Algorithms Group

San Francisco, CA // July - Sept 2014

Supervisor: Stuart Crawford

- Research musical emotions in relation to acoustic features, skin conductance, and facial expressions.
- Design and implement a listening experiment to predict emotions experienced during music listening.
- Apply statistical analysis to experimental data.

EMPLOYMENT

Research Intern

Dolby Laboratories, Advanced Technology Group
San Francisco, CA // June 2012 - August 2013

Supervisor: Poppy Crum

- Design and implement subjective tests for audio and video assessment
 - Analyze perceptual test results to improve post-processing
 - Obtain quantitative measures from subjective listening test to improve audio spatialization algorithms
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TEACHING EXPERIENCE

Teaching Assistant

UC San Diego, Department of Music
La Jolla, CA

- Audio Production: Mixing and Editing
Winter 2017; Winter 2016
 - Musical Psychoacoustics
Spring 2016
 - Audio and MIDI Studio Techniques I, II, and III
Fall // Winter // Spring 2013-2014
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PUBLICATIONS & PRESENTATIONS

Tamara Smyth, Jennifer Hsu, and Ryan Done. "Toward a real-time waveguide mesh implementation," in *Proceedings of the 2017 International Symposium on Musical Acoustics*. Montreal, Canada. June 2017, pp. 54-57.

Tamara Smyth and Jennifer Hsu. "Toward a real-time parametric percussion instrument based on a waveguide mesh," presented at the *5th Joint Meeting of the Acoustical Society of America (ASA) and Acoustical Society of Japan (ASJ)*. Honolulu, Hawaii. Dec 2016.

Cheng-i Wang, Jennifer Hsu, and Shlomo Dubnov, "Machine Improvisation with Variable Markov Oracle: Toward Guided and Structured Improvisation." *Computers in Entertainment (CiE)*. 14(3). Dec 2016.

Cheng-i Wang, Jennifer Hsu, and Shlomo Dubnov. "Music pattern discovery with Variable Markov Oracle: a Unified Approach to Symbolic and Audio Representations," in *Proceedings of the 16th International Society for Music Information Retrieval Conference (ISMIR)*. Málaga, Spain. Oct 2015, pp. 176-182.

PUBLICATIONS & PRESENTATIONS

Jennifer Hsu and Tamara Smyth, "Specifying sounding frequency of a voice model during live interactive saxophone performance," in *Proceedings of the 41st International Computer Music Conference (ICMC)*. Denton, Texas. Sept/Oct 2015, pp. 182-185.

AWARDS

2016-2017 Teaching Assistant Excellence Award
UC San Diego, Department of Music

VOLUNTEER

Paper Abstracts Reviewer

Intercultural Music Conference (ICM) 2016
icm2016.wordpress.com/
San Diego, CA // Dec 2015

Committee Member & Music Performer

Center for Computer Research in Music and Acoustics (CCRMA)
Modulations

ccrma.stanford.edu/events/modulations/

Stanford, CA & San Francisco, CA // Jan - April 2013

- Aid in venue, marketing, performer, and set time decisions
- Present a live electronic music set

Music Mixer

Main Stacks // mainstacks.wixsite.com/dance

SF Funksters // [facebook.com/funkanometrystf/](https://www.facebook.com/funkanometrystf/)

Senior Stacks

Sept 2008 - present

Weave together a mix of five to seven songs for various urban choreography dance teams.

SOFTWARE SKILLS

Programming: Matlab, Python, C/C++, Objective-C/iOS
Audio: Ableton, Pd

REFERENCES

Available upon request.