Akshay Cadambi

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EDUCATION

M.S. Media, Arts and Technology 2014 - 2017
University of California, Santa Barbara, *Santa Barbara, CA*
Thesis: *Lithe: An object-based audio-graph framework for spatial composition and sound design.*
Committee: Curtis Roads (chair), Andrés Cabrera, Clarence Barlow.

B.E. Electrical Engineering 2010 - 2014
PES Institute of Technology, *Bangalore, India*

PROFESSIONAL EXPERIENCE

Dysonics Inc. *Software Engineer* April 2019 - present

- Dysonics is a product-driven company with a strong R&D legacy and a focus on commercializing advanced spatial audio solutions and technology. It develops algorithms that run on embedded processors, gaming peripherals that target Windows 10, as well as other non-traditional hardware like linear speaker arrays. I was a part of a small (less than 10 person) team of talented engineers and researchers.
- Software architect and technical lead for all projects targeting Windows 10.
- Responsible for re-architecting and developing the whole Windows 10 software stack that integrated Dysonics spatial audio algorithms into Windows 10 audio driver plugins called audio processing objects (APO), enabling enhanced binaural rendering for several PC-based USB headphones and speaker arrays.
- Developed internal tools for development, testing, debugging, validation of products. Additionally, I developed tools that interface and translate R&D output to a form that's ready-to-deploy e.g., filter sets, configuration data, tuning.
- Involved in architecture and development of the core audio processing library used across several products. Some highlights include designing a custom extensible run-time configuration system, cross-platform build-system, design of threading and synchronization.
- Firmware development and debugging for embedded platforms like XMOS, AVR.

Xperi Corporation (formerly DTS Inc.) *Engineer II* Feb 2017 - Mar 2019

- Developed the *DTS Sound Unbound* application that launched in the Microsoft Store that enables enhanced system-level object-based audio on all Windows 10 computers.
- Integrated DTS post-processing technologies onto Windows audio driver plugins (called Audio Processing Objects, or APOs) for the following products: DTS:X Ultra, DTS Audio Processing, DTS Headphone:X V2.
- Developed control panel GUIs for Windows 10 using the UWP framework for deployment on the Microsoft Store.
- Responded to customer support issues, bugs, and customer requests.
- Translated R&D algorithms into functional proof-of-concept C++ integrations for evaluation of potential product features on the PC.
- Set up continuous build and integration pipelines using Jenkins helping shorten the time to release.

Dolby Laboratories Inc. *Software Development Intern*, Gaming Jun 2015 - Jan 2016

- Developed an internal tool for creating object-based audio test content. The tool was to be used for identifying edge cases in the Dolby Atmos renderer when deployed on game engines (Unity).
- This tool simplified trajectory generation by parameterizing based on geometry and also allowed for complex trajectories by interpolating between specified way-points.
- This tool used a Unity-based interactive UI for specifying and auditioning trajectories and also supported operation using the command prompt allowing for test automation.

Dolby Laboratories Inc. *Software Development Intern*, Gaming Aug 2016 - Oct 2016

- Integrated Dolby Atmos technologies into Wwise plugins for use in game engines like Unity.

TEACHING EXPERIENCE

Teaching Assistant *Special Topics in Electronic Music (Modular Synthesis)* Spring 2016
Prof. *Curtis Roads*
MAT 276N & Music 109/209N
Media Arts and Technology Graduate Program, UCSB.

Teaching Assistant *Lower division Physics Labs* 2015 - 2016 (7 quarters)
PHY 3L, PHY 4L, PHY 6AL, PHY 6BL, PHY 6CL
Department of Physics, UCSB.

PUBLICATIONS AND CONFERENCE PRESENTATIONS

Kıratlı S., Cadambi A., and Visell Y., "*HIVE: An Interactive Sculpture for Musical Expression*", publication, Proceedings of New Interfaces for Musical Expression (NIME), 2017, pp 267-270

Şölen Kiratli and Akshay Cadambi. 2017. HIVE. In SIGGRAPH Asia 2017 Art Gallery (SA '17). Association for Computing Machinery, New York, NY, USA, Article 8, 1.

Kıratlı S., Cadambi A., "*Explorations in Sonic Intelligence*", conference presentation, ACM - SIGGRAPH Asia, BITEC, Bangkok, Thailand, November 2017.

Cadambi, Akshay. "*Lithe: An object-based audio-graph framework for spatial composition and sound design*", Masters Thesis, University of California, Santa Barbara, 2017.

PROJECTS

HIVE 2016 - 2017
Produced in collaboration with Şölen Kıratlı.
Created via fusing aspects of sculptural form, spatial sound, and interactive methods, HIVE is an art installation that explores the notion of sentience and agency in the sonic medium. It was composed of a digitally fabricated, 3D printed, sculpture with embedded sensors and transducers, and ran a custom audio system written in C++ called *Lithe* (see below.) Produced with the support of the ReTouch Lab, UCSB IHC, and Systemics Artistic Production Fund. This piece was exhibited in multiple local and international venues (listed in the following section.)

Lithe 2016 - 2017
Master's Thesis.
A modular framework for defining and working with spatial audio effects written in C++. It allows for defining trajectories on a spherical or toric surface and maps them onto a euclidean rectangle. This mapping allowed for powerful trajectory generation that is idiomatic to audio synthesis in its use of oscillators, ADSRs, envelopes, etc.

Approximating π 2016
Composition by Clarence Barlow, software by Akshay Cadambi and Matthias Wagner.
This is a C++ implementation of a multi-channel computer music composition by Clarence Barlow based on the sonification of a series approximation that converges to the value of π. This was implemented to be able to run with 6 channels of synchronized audio and video. This implementation was exhibited as an installation as well as in a concert setting in local and international venues.

AlloMixer 2014
Student project.
A gesture-based interactive panning and mixing tool for object-based audio in the Allosphere facility at UCSB. The tool used motion capture and First-order Ambisonics to spatialize sound over the Allosphere's 54.1 speaker system.

EXHIBITIONS AND PERFORMANCES

ISEA Oct 2020
HIVE, interactive art installation, in collaboration with Şölen Kıratlı.
Juried exhibition, *Montreal, Cannada* (online-only, due to COVID-19 pandemic)

CURRENTS New Media Festival June 2018
HIVE, interactive art installation, in collaboration with Şölen Kıratlı.
El Museo Cultural, *Santa Fe, NM.*

ACM SIGGRAPH Asia - Art Gallery Nov 2017
HIVE, interactive art installation, in collaboration with Şölen Kıratlı.
BITEC, *Bangkok, Thailand.*

"First Thursdays" Santa Barbara Center for Art, Science and Technology Dec 2016
HIVE, interactive art installation, in collaboration with Şölen Kıratlı.
SBCAST, *Santa Barbara, CA*.

"*White Noise***"** Media Arts and Technology End of Year Show May 2016
HIVE, interactive art installation, in collaboration with Şölen Kıratlı.
UCSB Elings Hall, *Santa Barbara, CA*.

"*White Noise***"** Media Arts and Technology End of Year Show May 2016
Spokes, 2-channel electroacoustic composition performed with live-diffusion.
UCSB Elings Hall and SBCAST, *Santa Barbara, CA* (two performances).

BAR70W festival May 2016
Approximating π by Clarence Barlow, 6-channel audio-visual performance
Composed by Clarence Barlow, using software that I developed in collaboration with Matthias Wagner.
Conservatory for New Music, *Köln, Germany*.

"*White Noise***"** Media Arts and Technology End of Year Show May 2016
Approximating π *by Clarence Barlow*, 6-channel audio-visual installation.
Composed by Clarence Barlow, using software that I developed in collaboration with Matthias Wagner.
UCSB Elings Hall and SBCAST, *Santa Barbara, CA* (two locations, different days).

Allosphere Concert Feb 2016
CAFFEINE, multichannel electroacoustic composition.
The Allosphere, UCSB, *Santa Barbara, CA*.

MEDIA COVERAGE

HIVE mentioned in "Sonic symphony: Şölen Kıratlı and Akshay Cadambi's HIVE", by M.W. Simpson, in Pasatiempo, Santa Fe, New Mexico, June 8, 2018

HIVE pp 82-83 and *Approximating* π p. 32 in "*White Noise*", the exhibition catalogue of the Media Arts and Technology program's End of Year Show, May 2016

MISCELLANEOUS

Part of the organizing team of the *Media Arts and Technology End of Year Show* "Open Sources". 2015
Helped organize the annual group show of student works of the Media Arts and Technology Program, UCSB.