

Takahiko Tsuchiya

PhD in Music
Technology

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Portfolio:
<https://takaka.dev>

Expertise

Dynamic audio-visual web application (front / backend) and tools development
Audio signal processing, auditory display design, and data analytics
Rapid prototyping of interactive audio applications for native / mobile environments

Skills

Proficient programming languages: JavaScript / TypeScript, C++, Python

Proficient domain-specific languages and frameworks: Max/MSP, Csound, WebAudio, JUCE, WebAssembly, React, Redux, Webpack, AngularJS, D3, SQL, Bash

Used extensively in past projects: Java, AWS, MATLAB, R, Clojure(Script), Objective C

Open-Source Projects: [Data-to-Music API](#), [Sonar.js](#)

Audio production: Contemporary music theories (jazz / electroacoustic); Production software such as Ableton Live and ProTools; Live / studio recording and mixing workflow

Communication: English, Japanese

Education

Georgia Institute of Technology, Atlanta, Georgia (Aug. 2013 – May 2021)

M.S. & Ph.D. in Music Technology; Minor in Data Analytics and Coding (GPA 3.95)

Course works: Fourier Analysis, Data Compression, Digital Signal Processing, Data Analytics, Artificial Intelligence, Music Information Retrieval, Music Perception & Cognition, Acoustics

Teaching practicum: Audio Software Engineering (C++), Interactive Music (Max/MSP)

Berklee College of Music, Boston, Massachusetts (Jan. 2009 – May 2012)

B.F.A. in Music focused on Music Technology (GPA 3.84)

International Christian University, Tokyo, Japan (Apr. 2004 – Mar. 2008)

B.A. in Humanities with a focus on Ethno-musicology

Work and Research Experience

Georgia Tech Center for Music Technology, Atlanta, GA (Aug. 2013 – present)

Full-stack Developer: Worked primarily as the frontend lead for [EarSketch](#), a web platform for computer-science and music education with 2 mil users / 4k daily login. My contributions include the rearchitecting and migration of the codebase (150k LoC) from legacy Require / AngularJS to a modern Webpack / React / Redux / TypeScript stack and implementing collaborative editing.

The Concord Consortium, Emeryville, CA (June 2018 – December 2018)

NSF-funded Developer Intern: Created a suite of audio-visual plugins for a web data-science platform ([CODAP](#)). Also contributed in enhancing its math formula engine, map widget, etc.

2016 Web Audio Conference, Atlanta, GA (September 2015 – April 2016)

Program Committee: Served as a poster and demo chair, accommodating networked tech demos.

Second Sense Audio Technology Co., Ltd., Beijing, China (June 2015 - September 2015)

Developer / consultant: Co-authored the core synthetic engine for the software synthesizer [Wiggle VST](#). Also implemented its OSC wave shaper and 2D modulation modules.

GTRI Configurable Computing & Embedded Systems Lab, ATL, GA (May 2014 – March 2015)

Intern / RA: Developed audio-visual web dashboard and API for networked sensors (FPGA, Python, JavaScript) deployed in Decatur, GA. Tools I developed are now [featured as a course resource](#) at Georgia Tech. With the dashboard / API, we also premiered a data-driven generative music with Atlanta Symphony Orchestra musicians in a [public concert](#).

Boulanger Labs, Boston, MA (Dec. 2012 – Aug. 2013)

Lead audio developer: Authored 20+ audio-effect modules (in Csound) and implemented interactive audio functions (in Objective C / CoreAudio) of the [csSpectral app](#) for iOS.

Audivation Inc., Boston, MA (Aug. 2011 – May 2013)

Lead developer: Developed and maintained musical plugins for the [CsoundForLive](#) collection.

Assistive Music Technology Lab for Blind Musicians, Boston, MA (Aug. 2011-Apr. 2012)

Developer: Educational software development (Max/MSP, C) for blind musicians.

Selected Publications

Composing and Decomposing Electroacoustic Sonifications. *PhD Thesis (2021)*. Atlanta, Georgia.

Collaborative Coding with Music: Two Case Studies with EarSketch. Web Audio Conference 2018, Berlin, Germany.

A study of Exploratory Analysis in Melodic Sonification with Structural and Durational Time Scales. *International Conference on Auditory Display 2018*. Houghton, Michigan.

Spectral Parameter Encoding: Towards a Framework for Functional-Aesthetic Sonification. *International Conference on Auditory Display 2017*. State College, Pennsylvania.

Encoding Data into Sound and Music: A Live-Coding Approach. *International Conference on Live Coding 2016*. Hamilton, Canada.

Data-Driven Live Coding with Data-to-Music API. *Web Audio Conference 2016*. Atlanta, Georgia.

Multi-Modal Web-Based Dashboards for Geo-Located Real-Time Monitoring. *Web Audio Conference 2016*. Atlanta, Georgia.

Data-to-Music API: Real-Time Data-Agnostic Sonification with Musical Structure Models. *International Conference on Auditory Display 2015*. Graz, Styria, Austria.

Awards Received

Berklee College of Music - Roland Scholarship (2010 and 2011)

JYDA Creative Ideas Contest - 1st place: Funded my Japan-US exchange program (1999)