

Creating Telematic Musical Performances for Max and Web Instruments with Collab-Hub

Nick Hwang
The Media Arts & Game
Development Program
University of Wisconsin -
Whitewater
hwangn@uww.edu

Anthony T. Marasco
School of Music
The University of Texas Rio
Grande Valley
anthony.marasco@utrgv.edu

Eric Sheffield
Department of Music and
Theater Arts
SUNY Broome
sheffielder@sunybroome.edu

ABSTRACT

This workshop serves as an introduction to building remote/local networked audiovisual performances and pedagogical tools using Collab-Hub, a package for remote collaboration based on Node.js and implemented within Max and as a web-based interface. Collab-Hub is a system built for sharing of data and eliminates the need for collaborators to be aware of their/each others' IP address. It has applications in many performance paradigms, including telematic performance, laptop orchestra, mixed ensemble with digital elements, distributed control, net-to-physical interaction, and more.

1. INTRODUCTION

This workshop serves as an introduction to building networked audiovisual performances and pedagogical tools using Collab-Hub, a package for remote collaboration based on Node.js and implemented within Max and as a web-based interface. Collab-Hub is a system built for sharing various types of data and allows for different types of communication models (like pubsub, event, and broadcast). Collab-Hub also eliminates the need for collaborators to be aware of their/each others' IP address. It has applications in many performance paradigms, including telematic performance, laptop orchestra, mixed ensemble with digital elements, distributed control, net-to-physical interaction, and more.

Participants will be guided through the setup process of a basic Collab-Hub configuration using Max that can then be further developed for their own audiovisual performance or pedagogical needs. Participants will practice sharing collaborative data, and will then be able to communicate amongst each other within a collaborative performance.

Facilitators will also provide basic templates/code bases for participants to keep and expand into larger projects of their own. Some prior knowledge of Max will be helpful but not necessary. A registered copy of Max (for the purposes of saving edits) is necessary. All of the software is free to download and use.

The workshop facilitators will present an overview



Licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0). **Attribution:** owner/author(s).

Web Audio Conference WAC-2021, June 21–23, 2021, Barcelona, Spain.

© 2021 Copyright held by the owner/author(s).



Figure 1: The Collab-Hub logo

of their experiences developing projects with Collab-Hub that demonstrate different network performance paradigms—local, remote (telematic), and embedded (Internet of Things). Facilitators will show examples beyond basic implementations as well as existing implementations using other tools like PD, Web Interfaces, art installations, and Unity.

2. WORKSHOP INFORMATION

2.1 Audience

The primary audience for this tutorial are WAC participants interested (no prior experience necessary) in using a system for remote/local networked collaborative audiovisual performance which easily adds onto Max and is extensible to other environments like PD, P5.js, Internet of Things, and embedded devices. Those who are familiar with remote collaborative systems may be interested in how Collab-Hub affords various communication models and doesn't require clients/collaborator networking identities (like IP address, Ports). Overall, we hope to have a diverse group of participants with interest or experience in local/remote collaborative audiovisual performance to learn of Collab-Hub and how it enables the practice thereof through setup and communication.

Some prior knowledge of Max, Node, HTML, and JavaScript will be helpful but not necessary. All of the software is free to download and use.

2.2 Session Topics

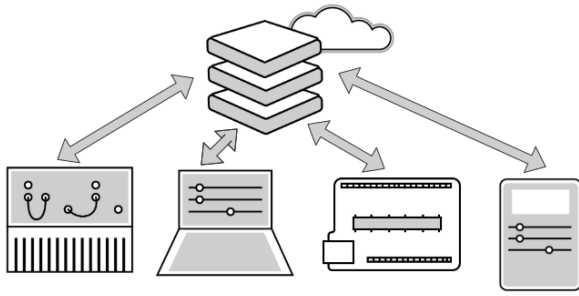


Figure 2: Collab-Hub brings together creative environments like PD, P5.js, Internet of Things hardware, and embedded devices.

- Introductions and Overview
 - Overview of Collab-Hub and Networked Audiovisual Performance practices. Discussion of networked audiovisual collaborative design and considerations.
- Setting up a Networked Performance Environment
 - Installation of Collab-Hub software (client software), walkthrough of client-server communication, establishing connecting with the server, and practice sending data to the server.
- Sending, Subscribing, Mapping
 - Work through examples of the communication paradigms within Collab-Hub. Participants will practice broadcasting, subscribing, joining/leaving rooms.
- Deeper Examples and Discussion
 - Facilitators will show examples of existing implementations of Collab-Hub, pedagogical examples, and implementations using tools beyond Max.
- Group Breakout and Collaborative Performance
 - Participants will brainstorm, coordinate, rehearse, and perform a collaborative performance using Collab-Hub.
- Future Work, Discussion, and Questions
 - Future developments for Collab-Hub and collaborative networked audiovisual performance.

3. WORKSHOP ORGANIZER BIOGRAPHIES

Nick Hwang is a composer and sonic artist interested in interactivity, collaborative systems, and gameful performance. He is an Assistant Professor in the Media Arts and Game Development program at University of Wisconsin-Whitewater. He has presented and shown work at New Interfaces of Musical Expression (NIME), the Society for

Electro-Acoustic Music in the U.S. (SEAMUS), the International Computer Music Conference (ICMC), ISEA, SIGGRAPH, NowNet Arts, NYCEMF, Web Audio Conference, Root Signals, MoxSonic, and the National Student Electronic Music Event (NSEME).

Anthony T. Marasco is an Assistant Professor of Music Technology and Composition at the University of Texas Rio Grande Valley. As a composer and sound artist, his works take influence from the aesthetics of today's Digimodernist culture, exploring the relationships between the eccentric and the everyday, the strict and the indeterminate, and the retro and the contemporary. His works and research have been featured at festivals such as New Interfaces for Musical Expression (NIME), the Web Audio Conference, the Toronto International Electroacoustic Symposium, the Society for Electro-Acoustic Music in the U.S. (SEAMUS), Electroacoustic Barn Dance, New York City Electroacoustic Music Festival, the International Computer Music Conference (ICMC), the National Student Electronic Music Event (NSEME), Mise-En Festival, Montreal Contemporary Music Lab, Electric LaTeX, and the Sound, Image and Interaction Design Symposium (SIIDS).

Eric Sheffield is a musician and maker currently interested in physics-based modeling, networked performance, and popular music. He received a PhD from the Experimental Music and Digital Media program at Louisiana State University. Eric has served as the tech director for the Electroacoustic Barn Dance and has performed and presented work internationally at several events, including NowNet Arts, NYCEMF, Root Signals, SEAMUS, NIME, and EMM. He is a founding member of the group Bell Monks, which has several releases available at music.bellmonks.com and on clang (clang.cl). He currently teaches music and recording as an assistant professor at SUNY Broome.

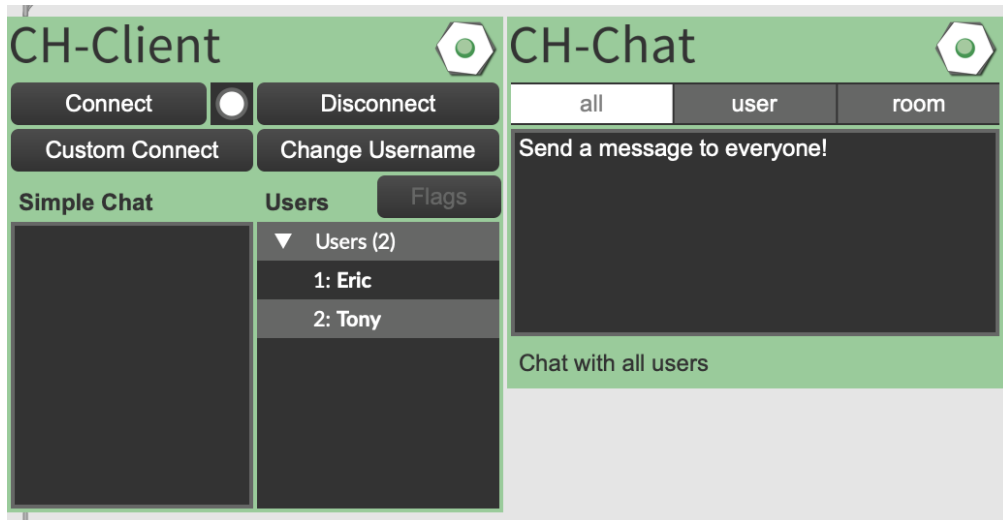


Figure 3: Example of Max patch modules for easy receiving and send of data between clients

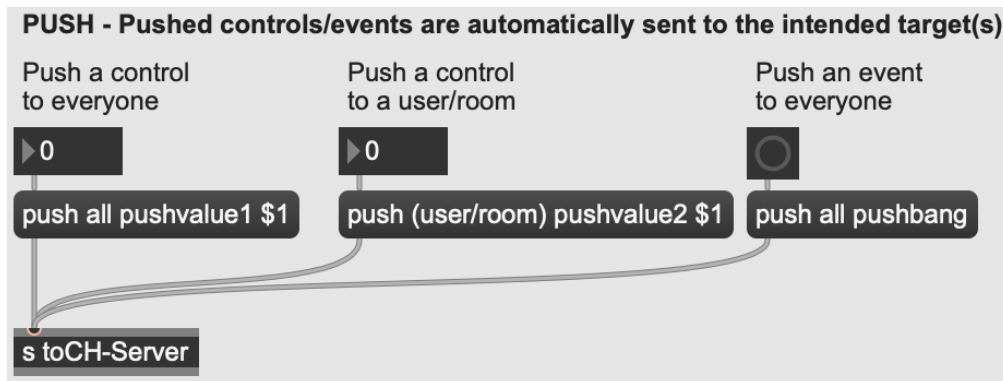


Figure 4: Sending data to all clients through a Push procedure in a Max patch

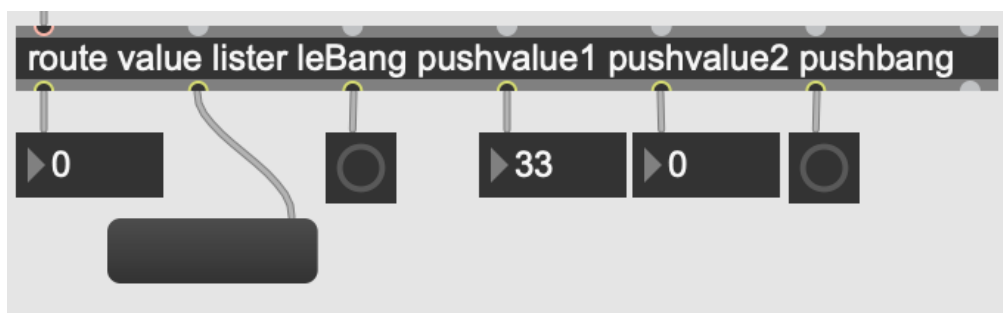


Figure 5: Routing incoming data using vanilla Max objects