A Prospective Analysis of Analog Audio Recording with Web Servers

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In a nutshell…

- To access an analog synthesizer online, for high-quality recording
- With batched access, it optimizes user and system time
- A prototype is running, a paper under review
- That leads to ubiquitous access to analog
- Goal of this paper: to check what else can and cannot be done: analog and acoustical processes

Outline

- Motivation
- Our Proposal
- Working Prototype
- Analysis
- Possibilities
  Synthesizers, acoustical, soundscapes, mixing, effects
- Final Remarks
- Discussion

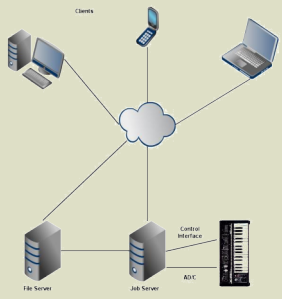
Motivation

- Digital is convenient, flexible, opens up lots of new possibilities - *"there's an app for that"*
- But Analog has unmistakable character, will not be replaced soon
- And so does acoustical, in fact, easier to understand how much
- Collecting analog synths is difficult, expensive, as it is renting, studio time
- Online access in real-time is *inefficient*, like renting, plus networking problems

The Proposal

- An analog system (server, farm) online, to render the sound of a performance
- Batched operation: users submit MIDI files and retrieve audio sometime after
- Initially thought as a commercial system, but there are many options
- Architecture: front-end, server-side, hardware (computer, synth, MIDI, Audio)

Architecture



First Working Prototype

- Studio Electronics ATC-1, Moog-type filter
- Recorded using a custom A/D converter
- PHP, JavaServer for queue and MIDI filter
- Cubase 6 Elements with key shortcuts
- AppleScript for GUI automation (delays)
- Check it: **ask for address**

Analysis - summary

- The main challenge: sound prediction
- Typical usage and possibilities
- Economics: cost estimate
- Options for service operation: commercial, networked, associated to plug-ins, etc…
- Options for sound preview: samples, calibrated plug-ins, user database…
- **Question: what other analog processes could be operated as servers?**

Advantages

- In the studio, most equipment is idle most of the time. The same at home, so collecting instruments does not pay off
- High usage (batched) leads to low cost
- We are applying the concept of sound rendering: plan first, render better at the end
- As a service, instead of a cost-compromised product, a higher quality can be attained
- Custom recording and different sound flavors

What is possible and what is not

- Microphones are not an option
- Pre-amplifiers are not an option
  (as you have to feed them)
- Guitar amplifiers? No. (they are pres)
  This is a big part of a studio…
- Effect chains are questionable (later)
- **But many things can be considered for analog server implementation: our goal**

Sinthesizers

- In production, MIDI-equipped analog
- Synthesizers from the past, MIDI-equipped
- MIDI-retrofitted
- Controlled with MIDI-to-CV converters
- Modified, or automated, allowing sound programming
- Custom instruments, special projects
- Restored, recriated (like vacuum tube synth)

Acoustical Instruments

- Pianos, organs, xylophones, stringed (guitar, bass)...
- Sound is captured with microphones
- Need automation (mechanical, some electromagnetic)
- No problem with parameter preview
- Needs a treated room

Robotic Instruments

- Pat Metheny's

Issues

- Pianos, organs, xylophones, stringed (guitar, bass)...
- Each instrument may have a particularity
- Ex: piano: tuning - software, hardware
- Ex: strings: articulation, fingering?
- Ex: electric guitar: effects path
- There are works addressing most of these issues

Miking leads to… soundscapes?

- Rain
- Streets
- People
- Forest
- Microphone movements
- room acoustics (or is it an effect?)

Analog Mixing

- Analog mixing, out-of-the box summing
- Traditionally done in a mixing console
- Mixing consoles have sound signatures
- Can be done
- All tracks must be transferred
- The automation must be transferred to the analog domain
- Server could remember tracks recorded on it

Effects?

- During recording, usually avoid effects
- After recording, need additional D/A and A/D conversion
- All this is being modeled today
- Dynamics, e.g., compression
- Reverb, delay, all others
- Makes more sense when mixing down

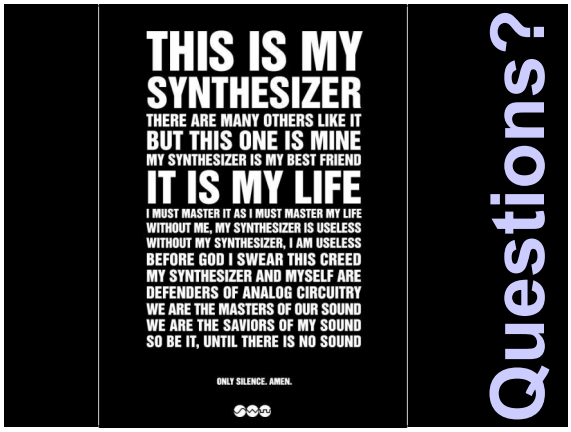
Main Conclusion

- This was a prospective paper
- Motivated by a working prototype
- It was found that many other analog / acoustic processes can be implemented remotely as audio servers
- There is already available technology for most of them
- Promissing possibilities arise

Final Remarks

- High usage (batched) leads to low cost
- The system opens up a lot of possibilities
- We can keep iconic historical instruments alive
- We can create new unique instruments
- Will promote the knowledge and use of the original instruments

- Future works? Let us discuss, there are many



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Thank you!

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