

## **Chapter 18. Meeting 18, Practices: Timing and Networking**

### **18.1. Announcements**

- Due this Wednesday 13 April: Performance Frameworks Draft
- Bring amps and controllers to next class
- Monday 18 April: No class (Patriots day)
- Due next Wednesday 20 April: Instrument 2 Drafts/Prototypes
- Due next Wednesday 20 April: Performance Frameworks

### **18.2. Quiz 3**

- ?

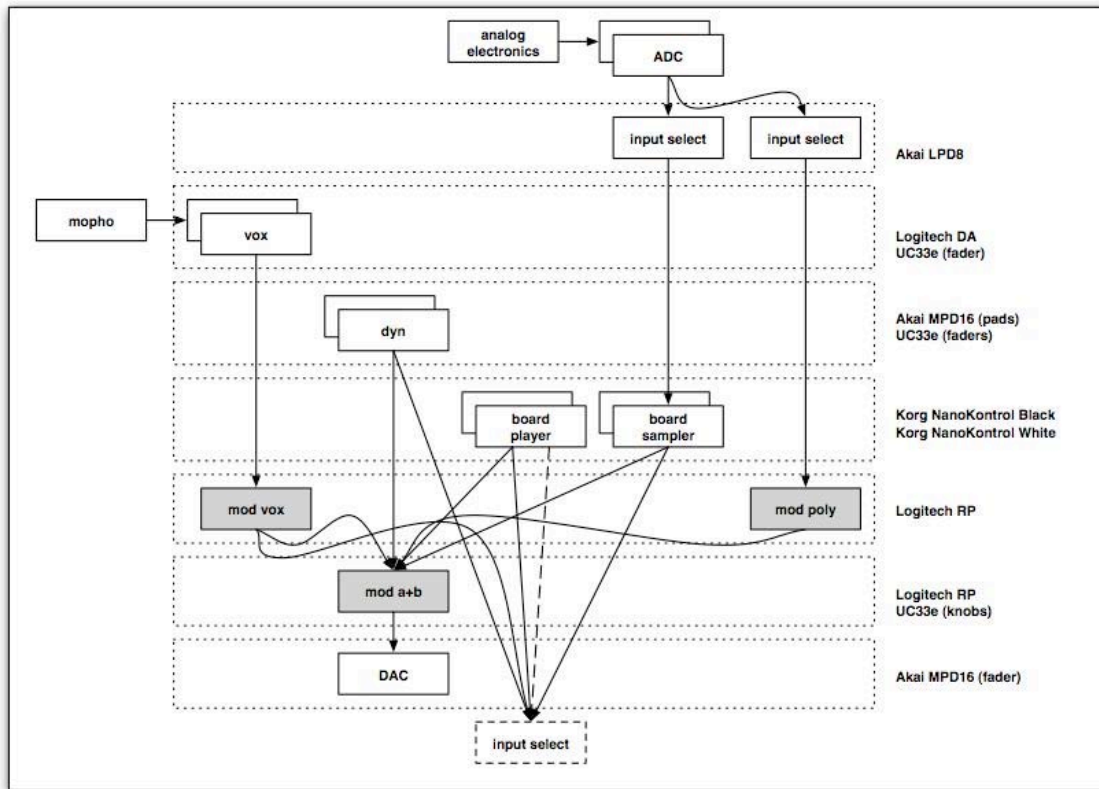
### **18.3. Listening: KIOKU**

- Kioku, “Pinari,” Both far and near, 2007

### **18.4. A Large Live Electronics System: Pulsefact**

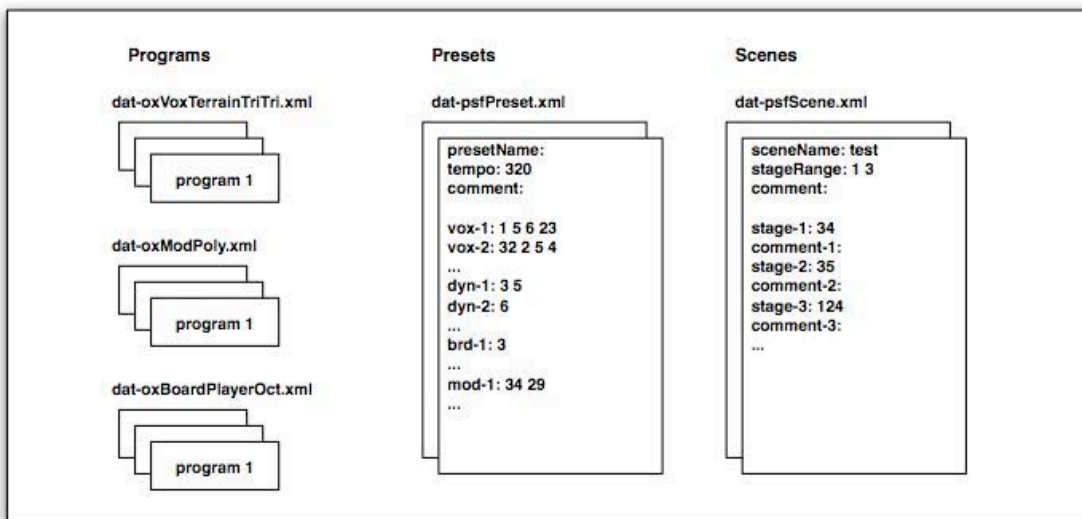
- Developed for KIOKU, expanded for pulsefact project
- Based on over 10 years of development in Max/MSP
- Permits multiple sound sources, self sampling and acoustic sampling, flexible routing, dynamic quantization configuration, data and preset management
- Signal and control flow

## Signal Flow and Controller Assignments



- Data management

## Parameter Organization



## 18.5. Pulsefact: System Design Goals

- Polyphony, layering, and simultaneity
- Employ audio fragments composed and produced outside of Max/MSP
- A variety of generators: direct control, indirect control, and looping
- A variety of transformers: effects and processors with variable input selection
- Ability to play in time, and to synchronize internal triggers with real-time quantization
- Ability to sample and process live and/or internal sources
- Huge dynamic range, multiple levels of gain control

## 18.6. Pulsefact: System Components

- Vox
  - Lead instruments, immediate control
  - Performed on Logitech Dual Actions
- Dyn
  - Background textures and layers
  - Triggered start and end, autonomous
  - Performed on Akai MPD-16
- Boards
  - Foreground/background textures and layers
  - Manual or looped beat triggered start and end, autonomous
  - Performed on Korg NanoKontrol
- Mods
  - Processing and transforming signals with variable input
  - Performed on Logitech Dual Action

## **18.7. Pulsefact: Dyn: Mapping**

- Akai MPD 16 and Evolution UC33
- Top eight pads trigger events, bottom eight stop events
- Aftertouch on top eight can be used for volume modulation
- Eight faders of Evolution UC33 provide levels

## **18.8. Pulsefact: Vox: Mapping**

- Logitech DA and Evolution UC33
- Joysticks provide primary control interface
- Keys select polyphonic voices, pitches, samples
- 9/10 keys rotate around circular array of Vox assignments
- Key-pads select samples, sample ranges, octave ranges, initial envelope amplitude levels
- Evolution UC33 provides master level

## **18.9. Pulsefact: Board: Mapping**

- Korg NanoKontrol (2)
- 8 voices and a master level control
- Top buttons trigger event or open gate to receive pulses
- Bottom buttons send signal to auxiliary output or start/stop sampling
- Knobs select pulse beat multiplier or playback rate scalar

## **18.10. Pulsefact: Mod: Mapping**

- Logitech RP and Evolution UC33
- Joysticks provide primary control interface
- Keys select processing types
- 9/10 keys rotate around circular array of Mod assignments

- Knobs on Evolution UC33 permit setting fixed levels

### **18.11. Pulsefact: Data Storage: Lowest Level: Programs**

- Each component/instrument has an XML file read by [pattrstorage]
- XML files define numerous programs by number

### **18.12. Pulsefact: Data Storage: Mid Level: Presets**

- A system preset assigns a list of programs to each instrument
- The first value is treated as primary; other values are available for browsing

### **18.13. Pulsefact: Data Storage: Outer Level: Scenes**

- A sequence of stages, each defined by a preset and a comment (performative context)
- Can step through scene stages to create a performance set
- Design scenes for specific performance/venue contexts

### **18.14. Pulsefact: Preset/Quantization Controls: Mapping**

- Akai LDP 8
- Upper pads browse programs
- Lower pads turn quantization on/off
- Upper knobs select preset browse focus
- Lower knobs select input for sampler/oxModPoly

### **18.15. Reading: Rebelo and Renaud, The Frequencyliator—Distributing Structures for Networked Laptop Improvisation**

- Rebelo, P. and A. Renaud. 2006. “The Frequencyliator—Distributing Structures for Networked Laptop Improvisation.” *Proceedings of the Conference on New Interfaces for Musical Expression* pp. 53-56.
- What motivated early attempts at networked music ensembles?
- What are some aspects of musical improvisation with acoustic instruments that authors describe as taken for granted?

- What are the main features of the described networking tool? What types of data is shared? What types of interaction is possible?

## 18.16. Networking: Device to Device Networks

- Can create a network on a local machine and have other machines join it
- Likely much faster and more bandwidth
- Mac OS X: Create Network..., give a name, and set IP address to something memorable: 192.168.1.100 (for a server)

Do not need to set subnet mask or router IP address

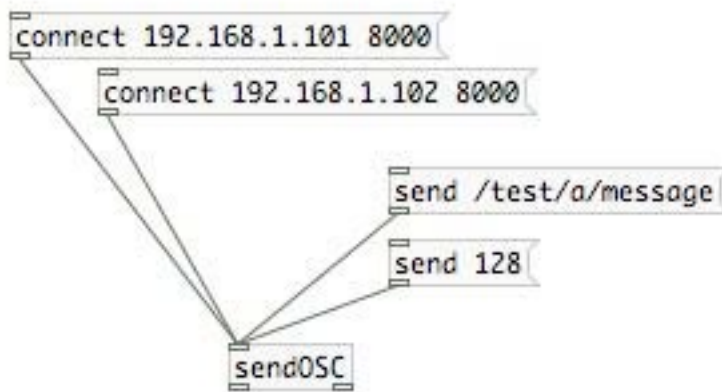
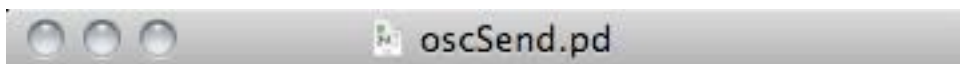
- For clients, set to Using DHCP to get IP address

## 18.17. Networking in Pd: Device to Device

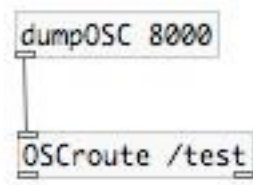
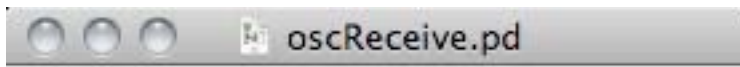
- Use [sendOSC] to send to specific IP address on the network

Must send a connect message with an IP and Port: [connect 192.168.1.100 8000]

Can then send any message that leads with a [send] message



- Can receive that message on another device with [dumpOSC 8000], where port is the same as that specified by [sendOSC]



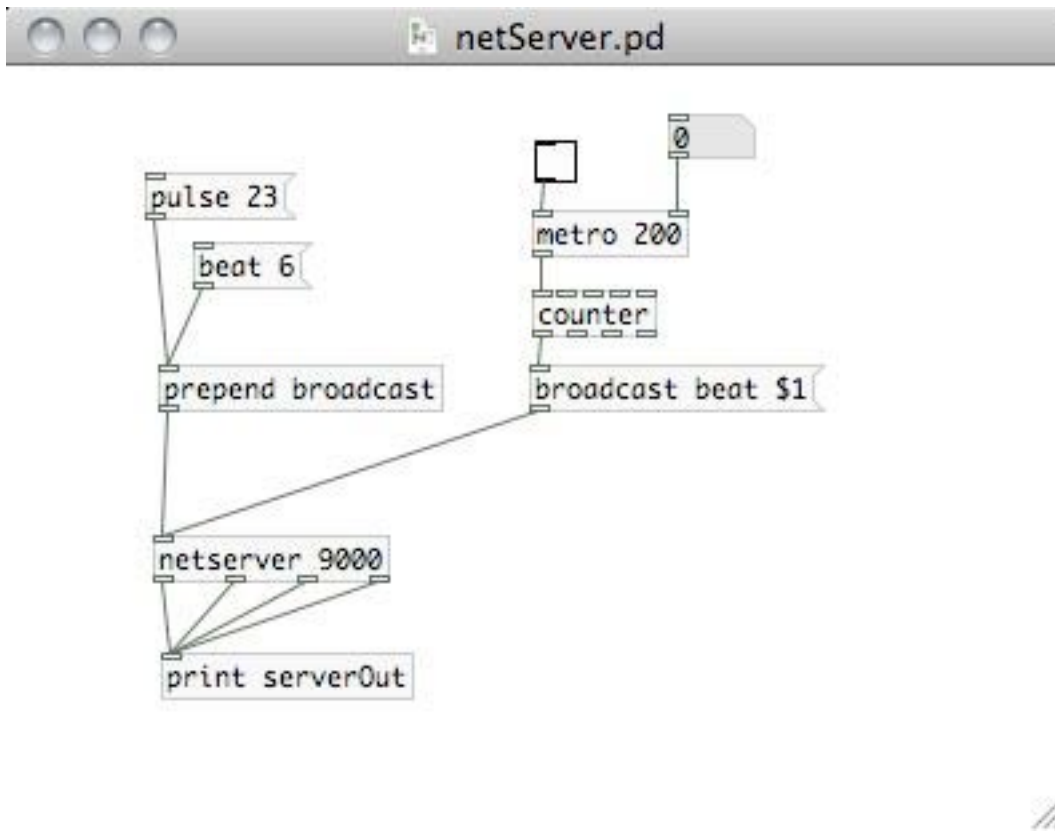
- Use [OSCroute] to parse messages

## 18.18. Networking in Pd: Server to Clients

- Use [netserver 9000] to create a server at a specific port

Send messages to all clients by preceding with [broadcast] message

Warning: can only have one server on one port at a time

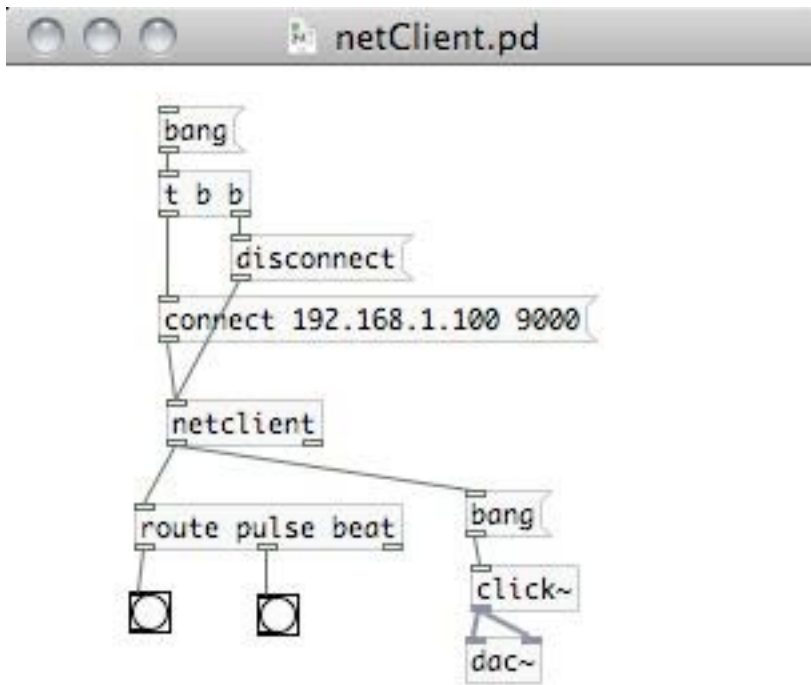


- Use [netclient] on each client machine

Create a connection to the server with a connect message, IP address, and port: [connect 192.168.1.100 9000]

Warning: sending the connect message more than once without disconnecting may cause Pd to hang





- Message transmitted can be lists, symbols, or floats

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