Remote Music Collaboration

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Seminar: Post-Desktop User Interfaces
Informatik X - RWTH-Aachen

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Collaboration on Music – Why?

- Past: music = part of everyone everyday life

- Nowadays: music = stylized activity requiring practice and accuracy
- Technology developments

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Collaboration on Music – Why?

- Making music alone not as contending as making music together

⇒ Systems to perform together

⇒ Systems to find collaborators/teachers

⇒ Systems to bring back everydayness to music

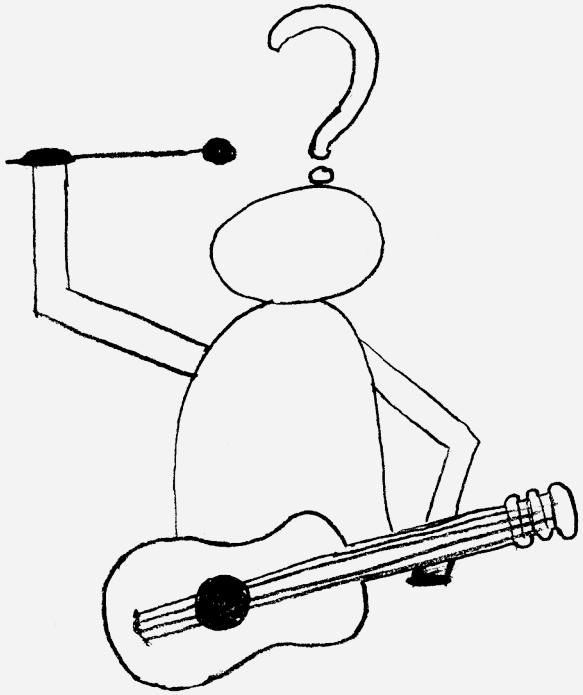
Composition – Improvisation – Performance

- **Composition:**
  - Write an arrangement to be played later
- **Improvisation:**
  - Creating music unprofessionally (example follows)
  - “Jam-sessions”
- **Performance:**
  - Playing precomposed music in front of an audience

- Sections tend to merge, example: Jazz-session

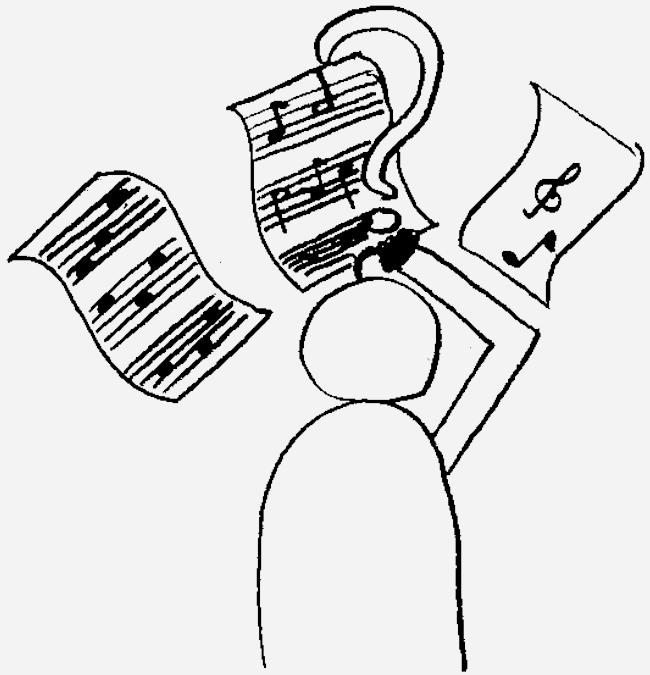
General Problems

- Learning curve
- Social interaction between participants
- Different level of skill
- Find remote collaborators



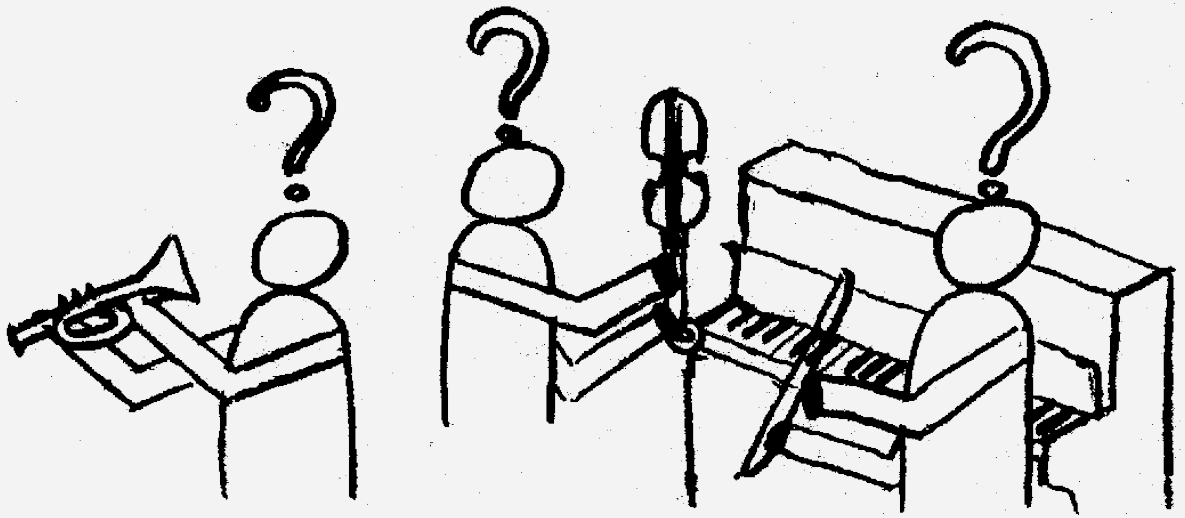
Problems of Composition

- Different forms of representing music/notes
- Scheduling the work
- Policies regulating user rights
- Get/receive (music) files from partners



Problems of Improvisation

- Communicating evaluation in real-time
- Possibility to agree on solos, etc.
- Record and Play back data



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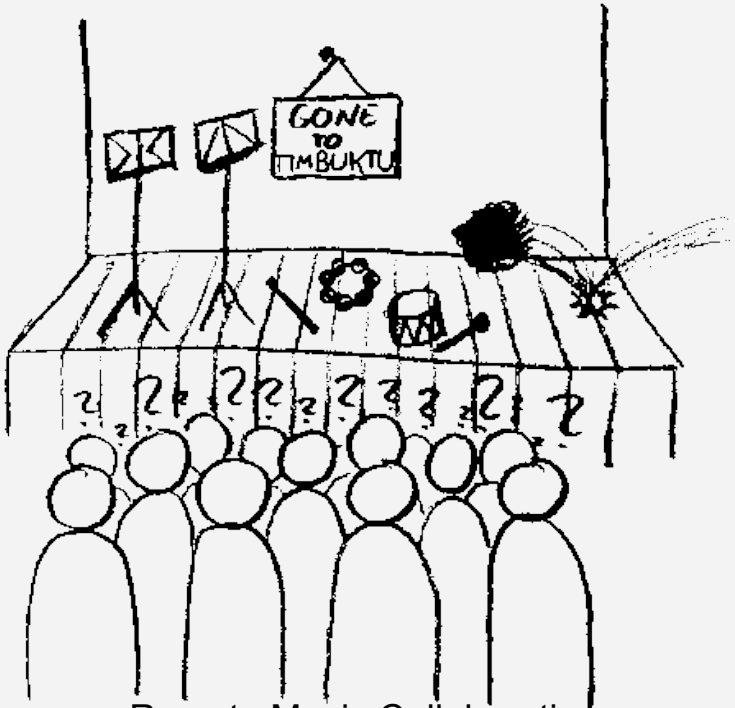
Problems of Performance

- Performing synchronous, i.e. short latency!
- See partner for a natural feeling
- See audience to get feedback
- Real-time communication
- Record and Play back data



The Systems

- Who?
- When?
- C, I, or P?
- Running?
- Technical background
- Problems solved
- Problems not solved
- Overview in the following checklist:

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Problem Check-List

	Problems	Solutions
General	Social interaction	
	Different skill level	
	Learning curve	
	Find remote collaborators	
C	Different music representation	
	Scheduling work	
	Policies	
	Get/receive (music) files	
I	Quick evaluation	
	Agree on solos, etc.	
	Real-time communication	
	Record & playback data	
P	Short latency	
	See partner	
	See audience	

List of Systems

1. Why?
2. C – I – P
3. The systems
   - Format
   - Systems
4. Summary
5. Questions?

Webdrum

Daisyphone

Metatone

MyVirtualBand

jam2jam

Ninjam

Digitalmusician

eJamming

Digital Immersive Performance

Myvirtualband.com

- Developed 2004 by Kelly Senecal and Scott Mason
- Focus: Composition
- System still in use, see www.myvirtualband.com
- Probably most naive idea: bulletin board
  - Artists record MP3 files of own track
  - Put it on an FTP server
  - Then open thread in BB to find collaborators
  - Collaborators download, add, upload

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Myvirtualband.com

1. Why?
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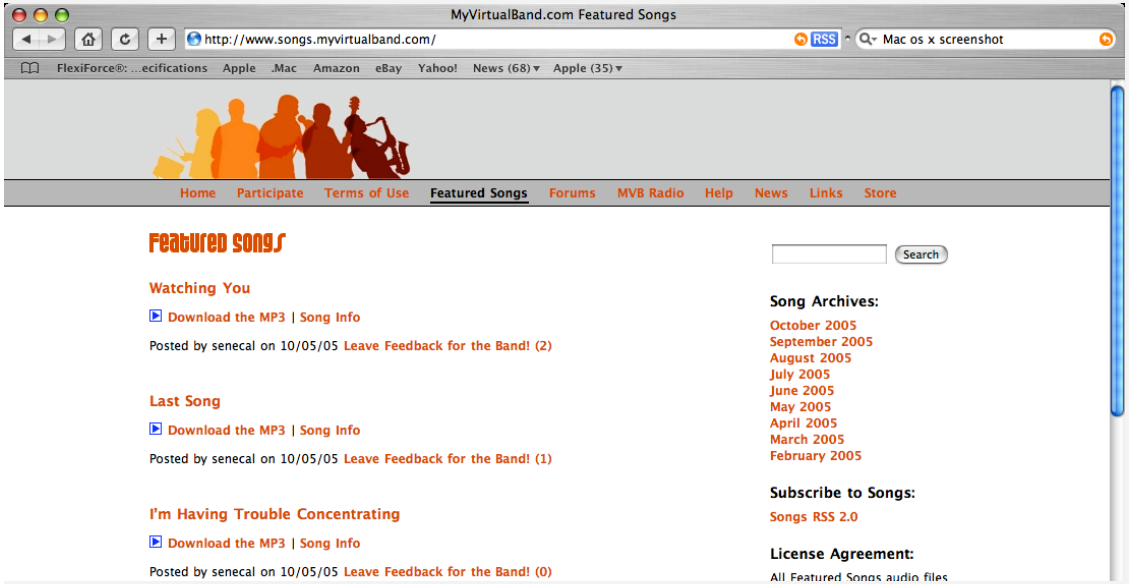
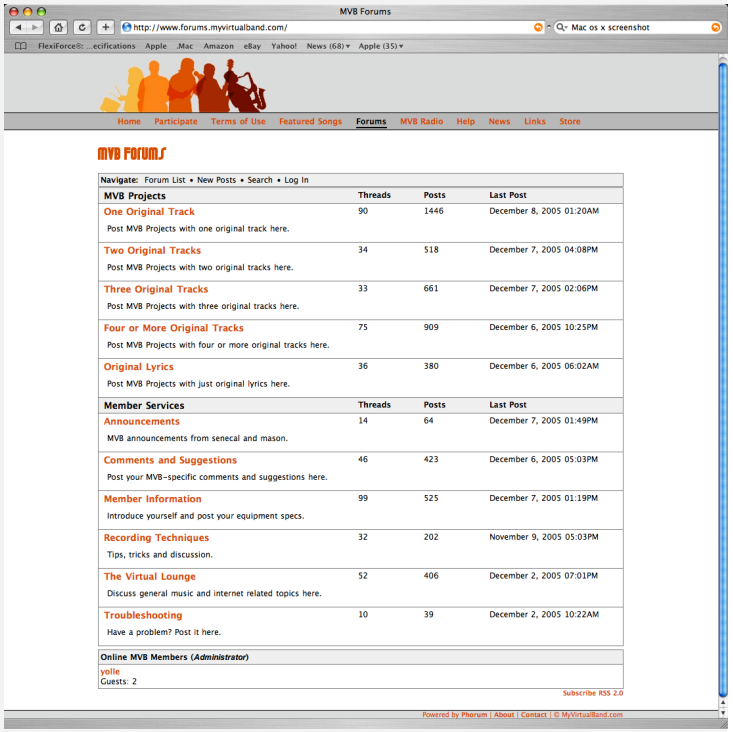
\+ Widely known social structure through BB

\+ Avoiding conflicts between different representations

\+ Very low learning curve

\- Unforseeable latency





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Myvirtualband.com

	Problems	Solutions
General	Social interaction	Bulletin board
	Different skill level	No solution
	Learning curve	Very low
	Find remote collaborators	Open new BB-thread
C	Different music representation	Solved by sharing already recorded tracks
	Scheduling work	No solution, biggest flaw of concept
	Policies	Up to users
	Get/receive (music) files	FTP-server
I	Quick evaluation	Not applicable
	Agree on solos, etc.	Not applicable
	Real-time communication	Not applicable
	Record & playback data	Not applicable
P	Short latency	Not applicable
	See partner	Not applicable
	See audience	Not applicable

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Digital Musician

- www.digitalmusician.net
- A commercial system, started this august!
- Focus: Composition
- Based on: A VST plug-in called DML, suitable for many audio applications (e.g. Garageband)
- Uses timestamps to overcome latency problem
- Peer to peer

Digital Musician

1. Why?
2. C – I – P
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4. Summary
5. Questions?

- Provides:
  - Streaming
  - File transfer
  - Video conferencing
  - Audio/text chat
  - Community
  - Email

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Digital Musician

	Problems	Solutions
General	Social interaction	Bulletin board, video/audio conferencing, Email, text chat
	Different skill level	No solution
	Learning curve	Low
	Find remote collaborators	Website offers space for advertisement
C	Different music representation	No solution, sequencer representation
	Scheduling work	Up to users
	Policies	Collaborators can control each others' playback & recording
	Get/receive (music) files	Email, File transfer
I	Quick evaluation	Video/audio conferencing, text chat
	Agree on solos, etc.	Not applicable
	Real-time communication	Video/audio conferencing, text chat
	Record & playback data	Depends on sequencer (so usually: standard buttons)
P	Short latency	Timestamps
	See partner	Video conferencing
	See audience	Not applicable

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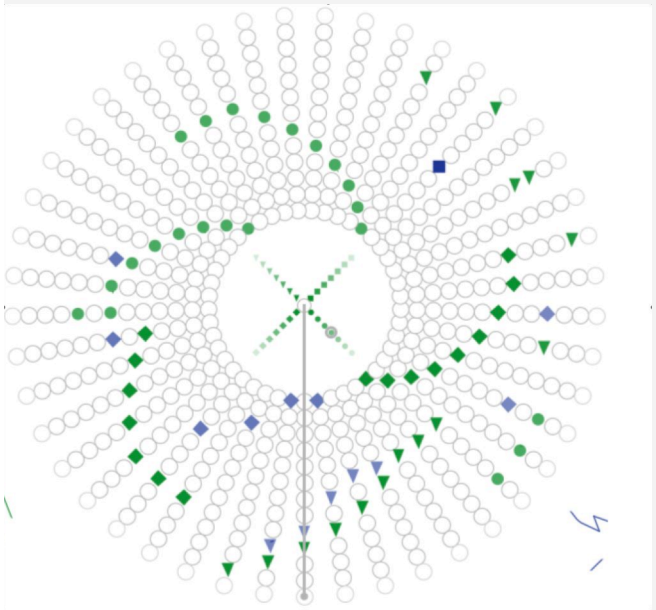
Daisyphone

- Started 2002 by N. Bryan-Kinns at Queen Mary, University of London
- Focus: “Remote group music *improvisation*”
- Although more of a research project still accessible: http://gouda.dcs.qmul.ac.uk

Daisyphone



- Loops of music:
  - Via a round space
  - Wandering line gives beat
- Place & delete four different note-types:
  - Each user gets different color
  - Saturation determines volume
  - Range from center determines pitch
  - Shape determines kind of note
- Users can “draw” text to talk to each other
- Notes fade with time

Daisyphone

\+ Low learning curve
\+ Quick comments
• Everybody can change other's contributions
\- Not really suited for creating complex music

• Video

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Daisyphone

	Problems	Solutions
General	Social interaction	Chatting by drawing, a bit inconvenient
	Different skill level	Not applicable, since aimed at non-professional use
	Learning curve	Low
	Find remote collaborators	No solution
C	Different music representation	Uses new representation
	Scheduling work	Not applicable
	Policies	None, but changes clarified by color of changing user
	Get/receive (music) files	No solution
I	Quick evaluation	Adding drawn comments
	Agree on solos, etc.	Not applicable
	Real-time communication	Adding drawn comments
	Record & playback data	No solution, notes fade with time
P	Short latency	Centralized beat, short length of loop
	See partner	No solution
	See audience	Not applicable

Ninjam

- www.ninjam.com
- Under development, started 2005
- Focus: Real-time improvisation / performance
- Implemented as stand-alone client application connecting to a server
- Uses OGG Vorbis codec to minimize datastreams & thus latency
- Technical idea:
  - Record an interval
  - Then play received interval
  - Playing along with others' previously recorded interval!

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Ninjam

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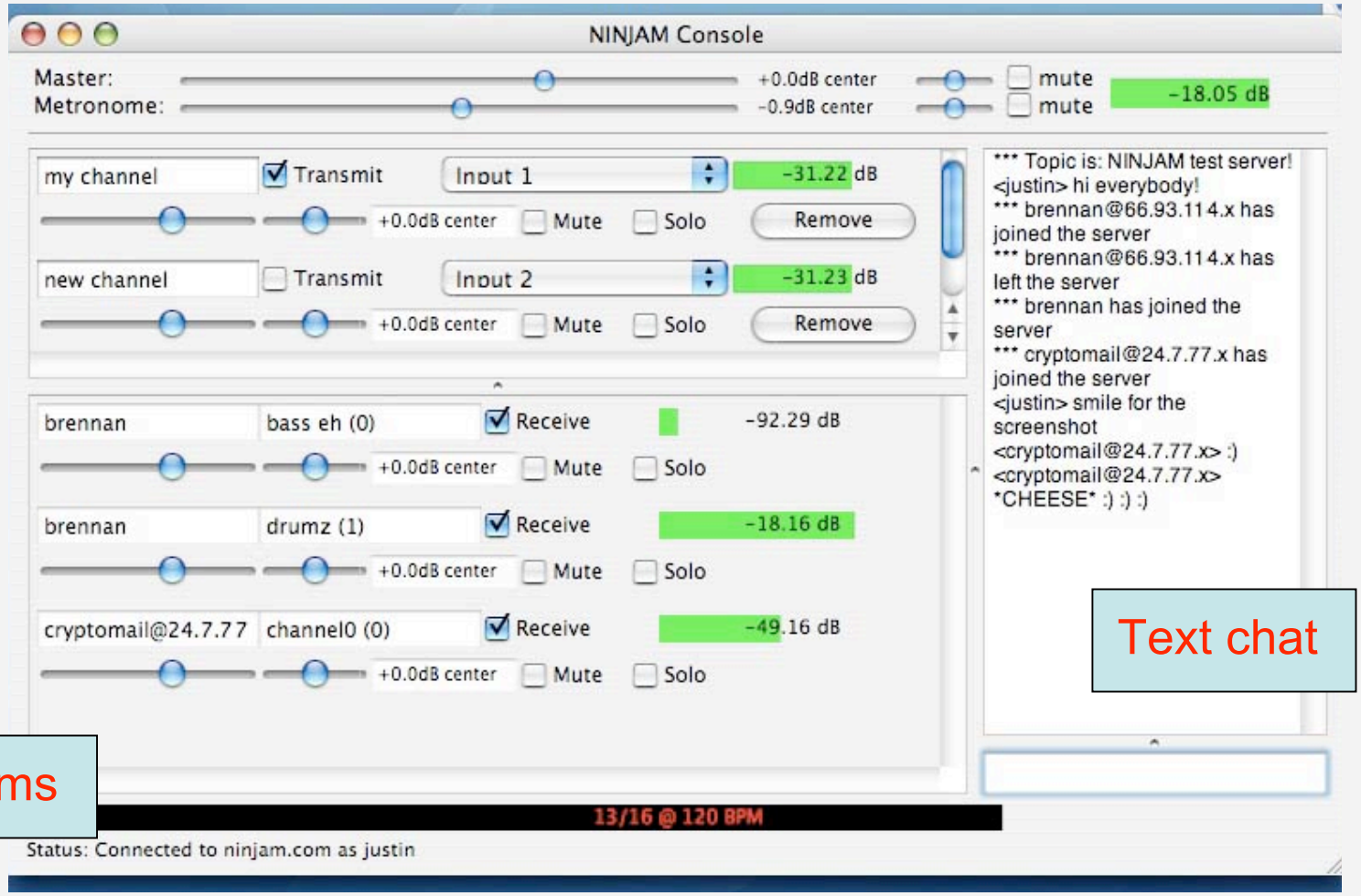

mixing streams

Text chat

Ninjam

\+ Server architecture avoids NAT & Firewall issues

\+ Very easy to use

\+ Availability: clients & servers (!) for Mac, Windows and Linux

\- Clients have to mix streams themselves, needing more bandwidth

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Ninjam

	Problems	Solutions
General	Social interaction	Text chat
	Different skill level	No solution
	Learning curve	Very low
	Find remote collaborators	No solution, perhaps server-info in the future
C	Different music representation	Not applicable
	Scheduling work	Not applicable
	Policies	Mix streams on clientside, not affecting others
	Get/receive (music) files	No solution
I	Quick evaluation	Text chat
	Agree on solos, etc.	Text chat
	Real-time communication	Text chat
	Record & playback data	Recording streams in OGG or WAV
P	Short latency	Play/Record-intervals & OGG Vorbis codec
	See partner	No solution
	See audience	Not applicable

eJamming

- www.ejamming.com
- Commercial product, started in 2001
- Focus: Real-time improvisation / performance
- Implemented as stand-alone client application connecting to a network
- “Lobby” and “Stage”
- Uses MIDI & compatible instruments
- Technical idea:
  - Delay own instrument's sounds
  - Until they're in sync with incoming sounds

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eJamming

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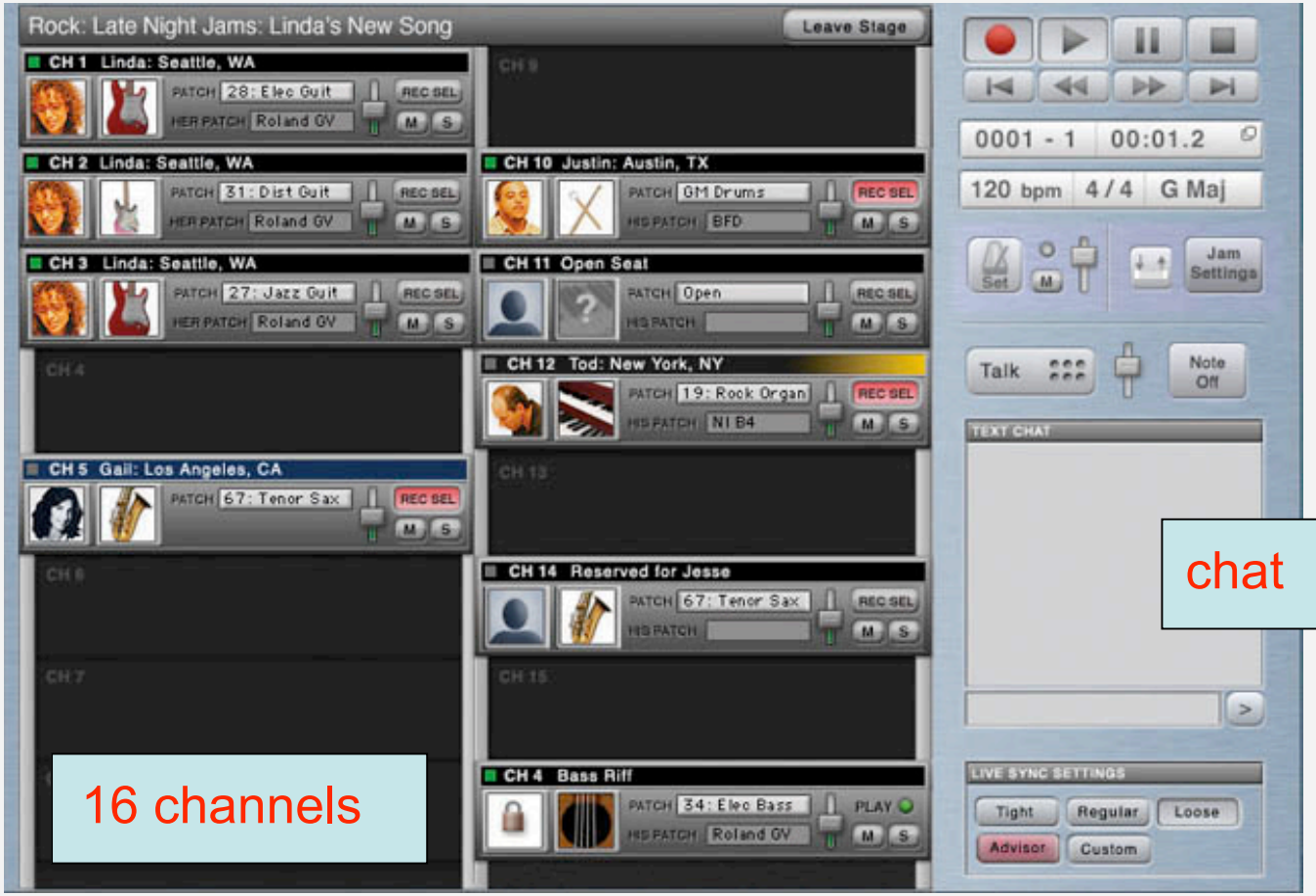
Online stage



eJamming

+ Professional software, following “speak user's language” rule
+ Available for Windows and Mac
+ High community support due to network
+ Even deals with copyright-issues of recorded song
- Limited to MIDI-sounds
- Commercial
- Video

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eJamming

	Problems	Solutions
General	Social interaction	Voice chat, network
	Different skill level	No solution
	Learning curve	Medium
	Find remote collaborators	Network
C	Different music representation	Not applicable
	Scheduling work	Not applicable
	Policies	Not applicable
	Get/receive (music) files	Not applicable
I	Quick evaluation	Voice chat
	Agree on solos, etc.	Voice chat
	Real-time communication	Voice chat
	Record & playback data	Recording streams in MIDI
P	Short latency	Delay own instrument till it is in sync with others
	See partner	No solution
	See audience	Not applicable

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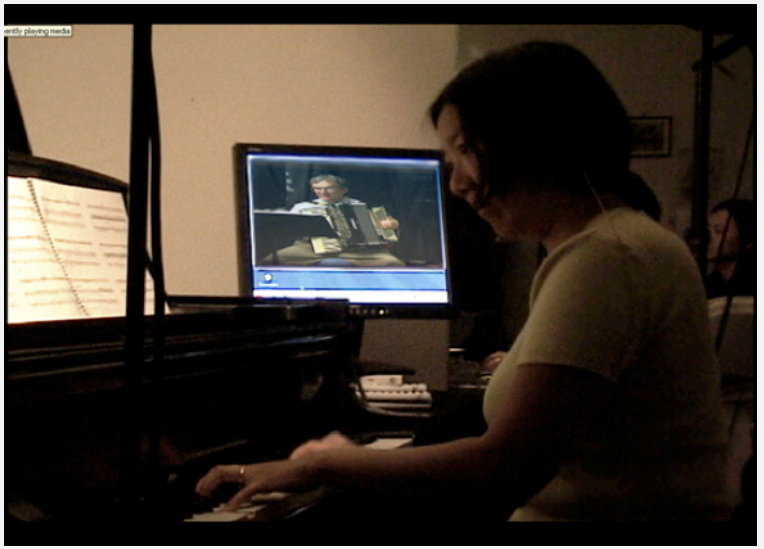
Distributed Immersive Performance

- http://imsc.usc.edu/dip/vision.html
- Not really a system, research project
- Started June 2002, last performance Sep. 2004
- A. A. Sawchuk, R. Zimmermann, E. Chew et. al.
- For us most interesting: DIP v1.0:



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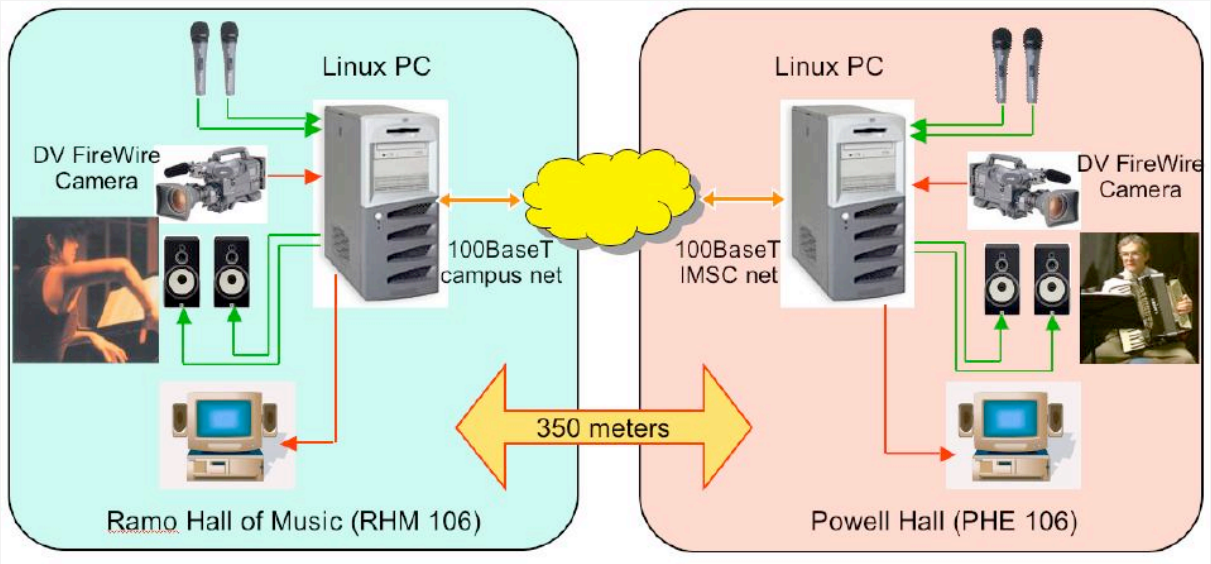
Distributed Immersive Performance

- 2 remote performers, audience with one of them
- Lone performer has earphone and monitor
- Audience and other performer have large screen

  HD video plus 10.2 immersive audio
- Video delay: 110 ms compressing + <5 ms net
- Audio delay: <10 ms processing + <5 ms net

Distributed Immersive Performance



- Video unusable for sync-cues, use sound instead
- Compensating delay by
  - Anticipation
  - Scaling back on spontaneity
- Co-location with audience
  ⇒ Imbalance in control
- Video

Distributed Immersive Performance

	Problems	Solutions
General	Social interaction	Visual feedback and audio chat
	Different skill level	No solution
	Learning curve	Not applicable
	Find remote collaborators	Not applicable
C	Different music representation	Not applicable
	Scheduling work	Not applicable
	Policies	Not applicable
	Get/receive (music) files	Not applicable
I	Quick evaluation	Visual feedback and audio chat
	Agree on solos, etc.	Visual feedback and audio chat
	Real-time communication	Visual feedback and audio chat
	Record & playback data	Not applicable
P	Short latency	Depends on actual experiment, mostly closed locations & uninet
	See partner	Visual feedback and audio chat
	See audience	Visual feedback and audio chat

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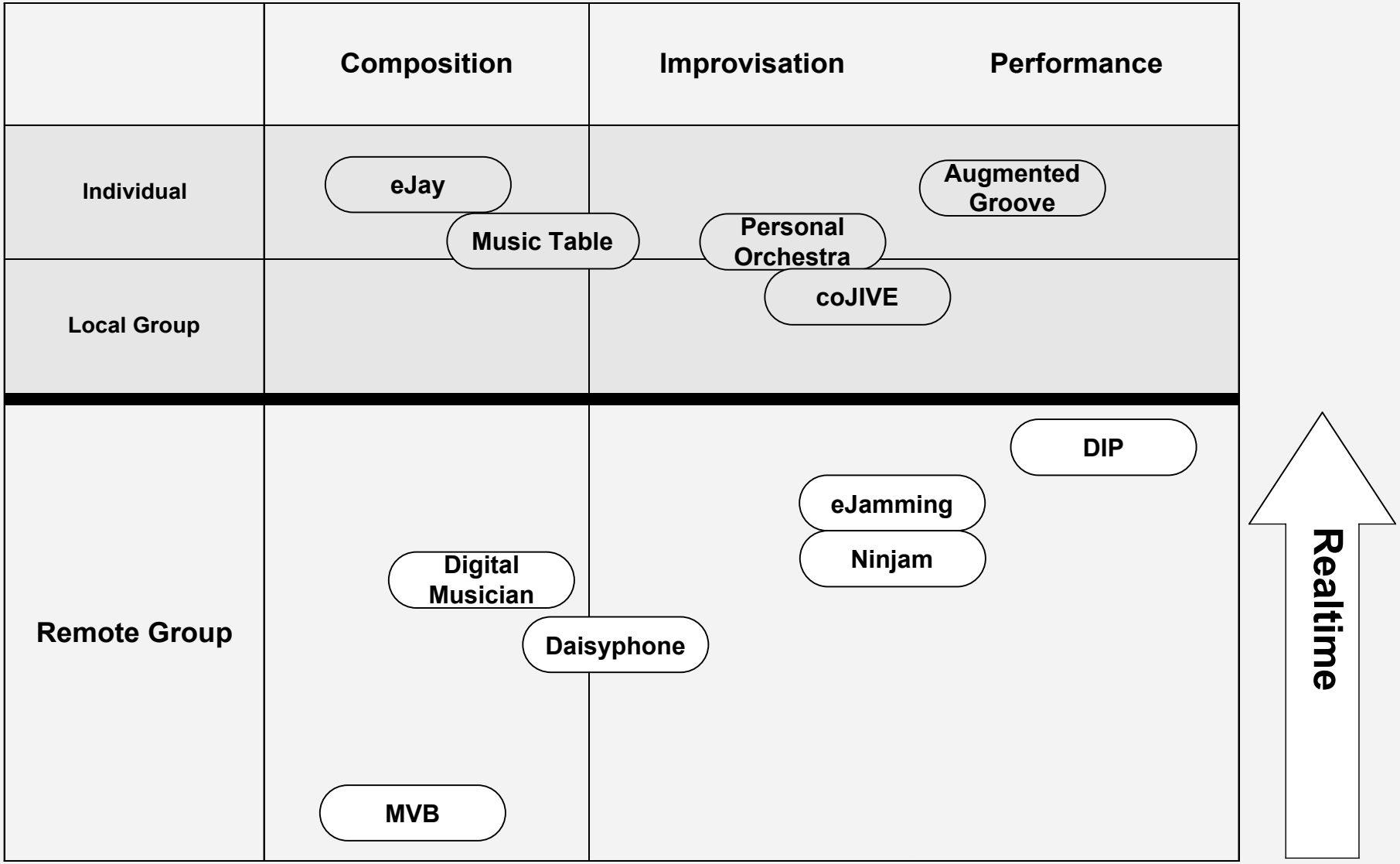
MC-Space



Questions?