Network Music for Social Networks

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IODA Marketing

The Mommyheads in a New Time Warner Cable Ad

Fake or not,

...it's not a new dream...

(I guess probably fake, don't see wires)

9 years ago

2001

384 years ago

1626

(from) NEW ATLANTIS

by Francis Bacon, 1626

We have also sound-houses, where we practise and demonstrate all sounds and their generation. We have harmony which you have not, of quarter-sounds and lesser slides of sounds. Divers instruments of music likewise to you unknown, ...

We have certain helps which, set to the ear, do further the hearing greatly; we have also divers strange and artificial echoes, reflecting the voice many times, and, as it were, tossing it; ...

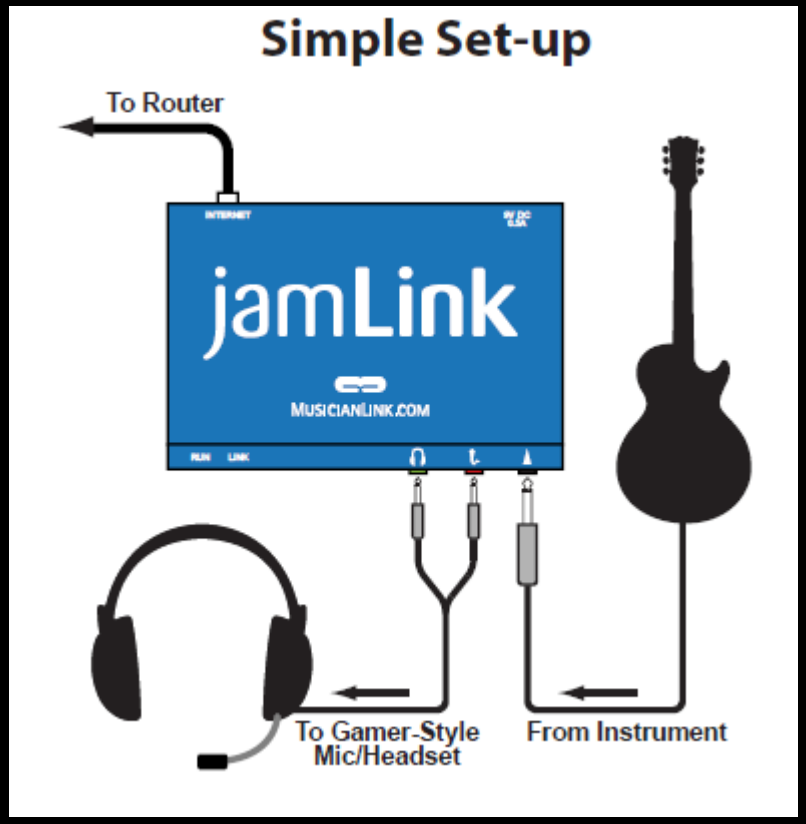
We have all means to convey sounds in trunks and pipes, in strange lines and distances.

MUSICIANLINK

Bay Area-wide trio pulled from youtube jamming over home networks, 2010

dedicated hardware $200
controlled by a web browser

uncompressed audio
up to 4 connections



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Presented by HYUNDAI

YouTube Symphony Orchestra 2011

Home | Prepare | Submit | Learn | Experiment

YouTube Symphony

LSO performs

Paula Zahn invites you

Joshua Roman invites

PLAY YOUR PART. AROUND THE WORLD.

YOUTUBE SYMPHONY ORCHESTRA 2011
SYDNEY OPERA HOUSE, MARCH 14-20, 2011

March 2011 will mark the YouTube Symphony Orchestra's return - and once again, we invite you to be a part of it. There are two ways you can audition: submit your video audition for the orchestra or submit a solo improvisation to a piece composed specifically for the orchestra by American composer Mason Bates.

The best and most creative performers will be selected to form the YouTube Symphony Orchestra 2011 and invited to perform in March at the Sydney Opera House, under the direction of world-renowned conductor and YouTube Symphony Artistic Advisor, Michael Tilson Thomas.

Check out the audition categories below to find out more about what you have to do. More information can also be found in the FAQs and the Official Rules. Submissions close November 28, 2010.

Orchestral Audition ▶ | Solo Improvisation ▶

jamLink use cases, since NAMM '10

-- open jamming, finding music friends
-- rehearsals, concerts
-- auditions
-- teaching
-- recording, remote overdub

...and physically avoiding players... (for whatever reason)

http://www.masternewmedia.org/
http://www.kompoz.com/
http://www.esession.com/
http://www.digitalmusician.net/
http://www.ejamming.com/
http://onlinejamsessions.com/
http://www.tjoon.com/
http://www.smule.com/
http://www.indabamusic.com
http://www.ohmstudio.com/
http://www.bojam.com/
http://www.tunerooms.com/
http://www.ninjam.com
http://www.thetrackshack.com/

QoS = QoResults

these requirements:

total audio delay (one-way) < 25msec
bandwidth ca. 1Mbps / channel (uncompressed)
low jitter
low-latency audio in the host devices (laptop, etc.)

hardware and software solutions for tight sync < 25ms

from home:
  jamLink hardware uncompressed / cable, fios
(max 1300km / 800mi)
  jacktrip with CELT coder / DSL, cable, fios
(new)

from CCRMA:
  jacktrip software uncompressed / Internet2
(max 3000km / 1800mi)

Most video conference systems are engineered for dialog (which interferes with tight rhythmic sync).

Skype (low audio quality, long delays)
Telepresence (compression artifacts, video steering by audio)

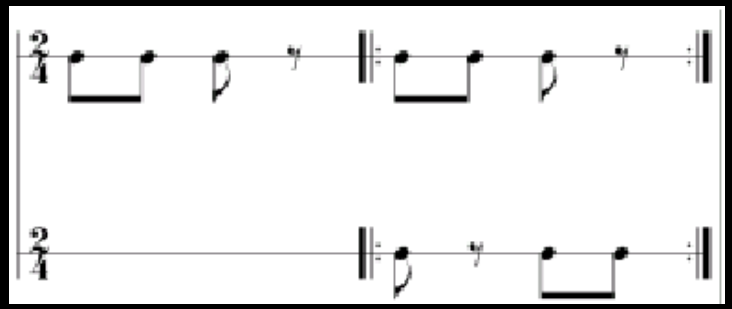
In general, conference systems align video / audio for lip sync (delaying audio). A single video frame already burns 30msec and video acquisition / transmission / display requires several frames.

Experiment Designed to Determine Effect of Latency on Ensemble Accuracy

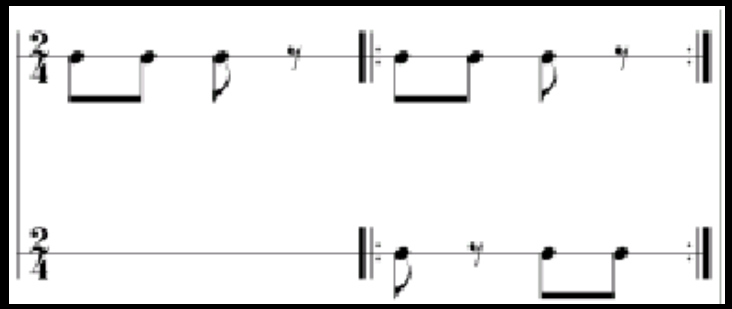
...just how long is 25msec?

Subjects = students and staff at Stanford
(paired randomly)

Task = play rhythm accurately,
keep an even tempo
(no strategies given)

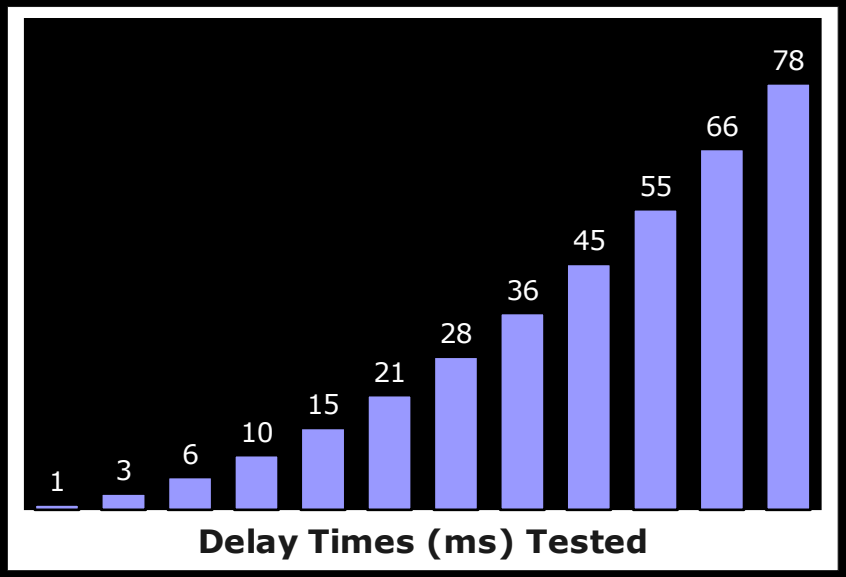


Interlocking rhythm



Sound

(3ms delay each direction, metronome cue = mm94)



Delays: 1 – 78ms (each way) in 12 steps

Deceleration from longer delay
but where does it start to cause
trouble?

Sound
(78ms delay each direction, metronome cue = mm90)

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doi:10.1068/p6465

Effect of temporal separation on synchronization in rhythmic performance

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Abstract. A variety of short time delays inserted between pairs of subjects were found to affect their ability to synchronize a musical task. The subjects performed a clapping rhythm together from separate sound-isolated rooms via headphones and without visual contact. One-way time delays between pairs were manipulated electronically in the range of 3 to 78 ms. We are interested in quantifying the envelope of time delay within which two individuals produce synchronous performances. The results indicate that there are distinct regimes of mutually coupled behavior, and that 'natural time delay'—delay within the narrow range associated with travel times across spatial arrangements of groups and ensembles—supports the most stable performance. Conditions outside of this envelope, with time delays both below and above it, create characteristic interaction dynamics in the mutually coupled actions of the duo. Trials at extremely short delays (corresponding to unnaturally close proximity) had a tendency to accelerate from anticipation. Synchronization lagged at longer delays (larger than usual physical distances) and produced an increasingly severe deceleration and then deterioration of performed rhythms. The study has implications for music collaboration over the Internet and suggests that stable rhythmic performance can be achieved by 'wired ensembles' across distances of thousands of kilometers.

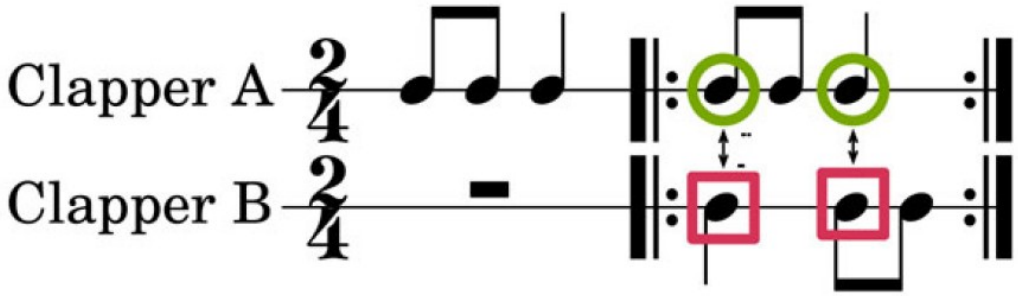


Figure 1. [In color online, see http://dx.doi.org/10.1068/p6465] Duo clapping rhythm used to test the effect of temporal separation. Subjects in separate rooms were asked to clap the rhythm together while hearing each other's sound delayed by a slight amount. Common beats in the duo clapping rhythm provide reference points for analysis of ensemble synchronization. Circles and squares represent synchronization points.

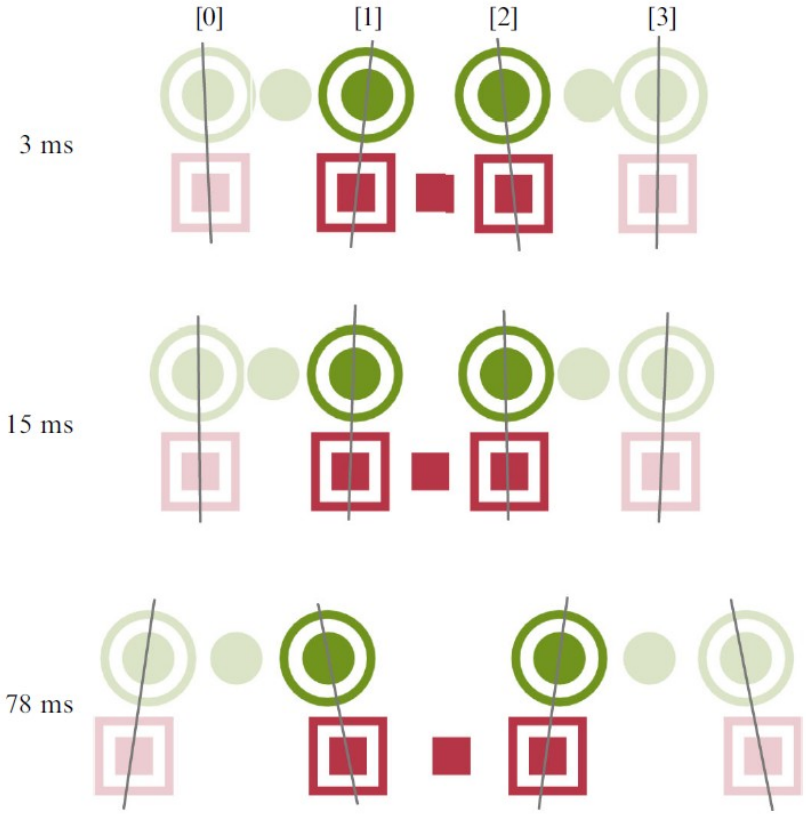


Figure 4. [In color online.] Lead/lag at different delays. Clapper in 'San Francisco' is green circles, clapper in 'New York' is red squares. Ideally, each vertically adjacent pair of events is simultaneous. Leading or lagging by one subject with respect to the other at these points is related to delay: leading at 3 ms; approximately synchronous at 15 ms; lagging at 78 ms. Lead/lag is measured with respect to measure-length periodicity. Odd-numbered events have inverted (antiphase) sign.

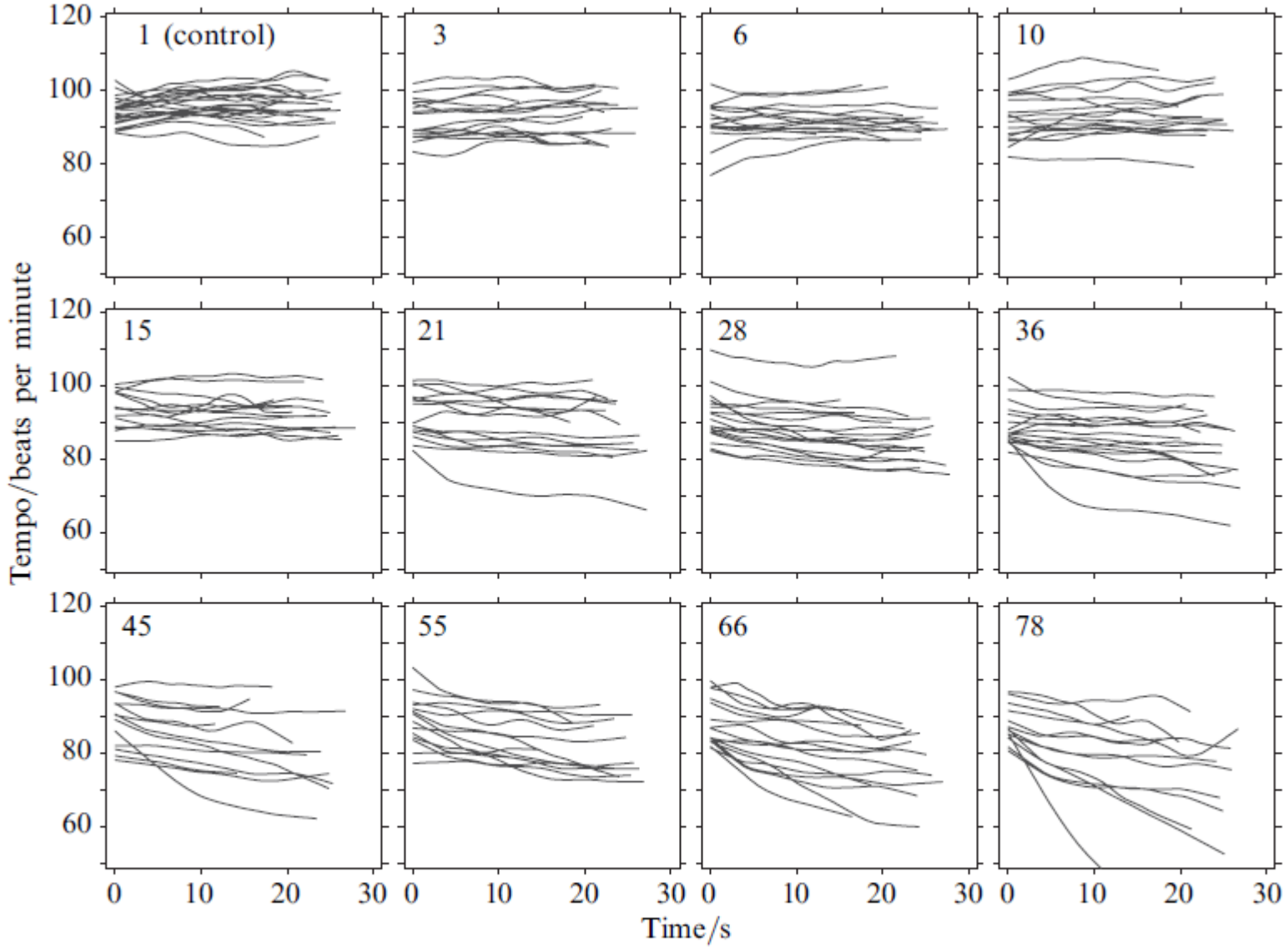


Figure 5. All trials' tempo curves grouped by delay. Tempo acceleration during a given performance is tracked by measuring inter-onset intervals as shown in figure 3. The delays (in ms) are shown in top left corner of each graph.

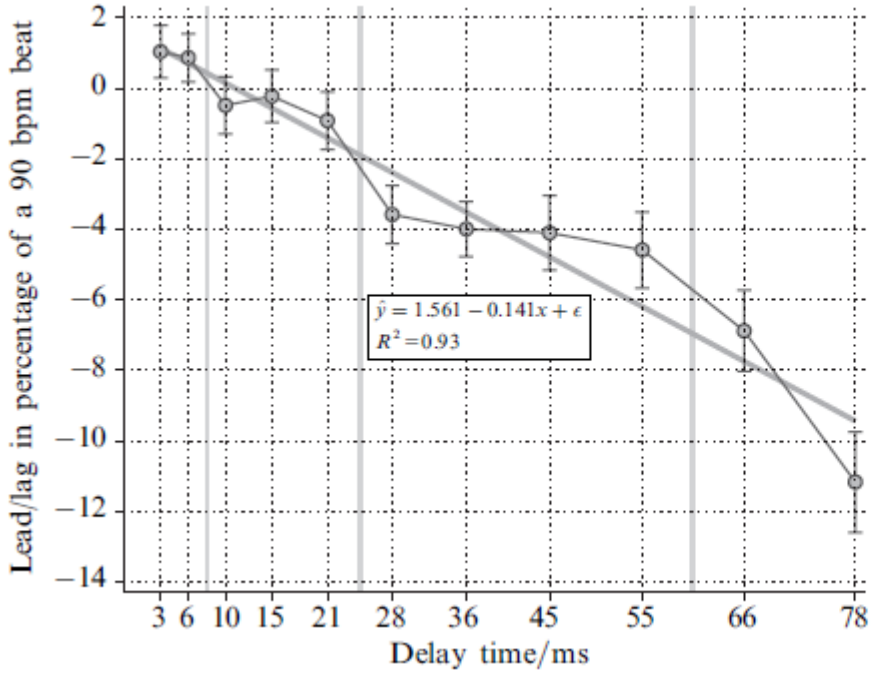
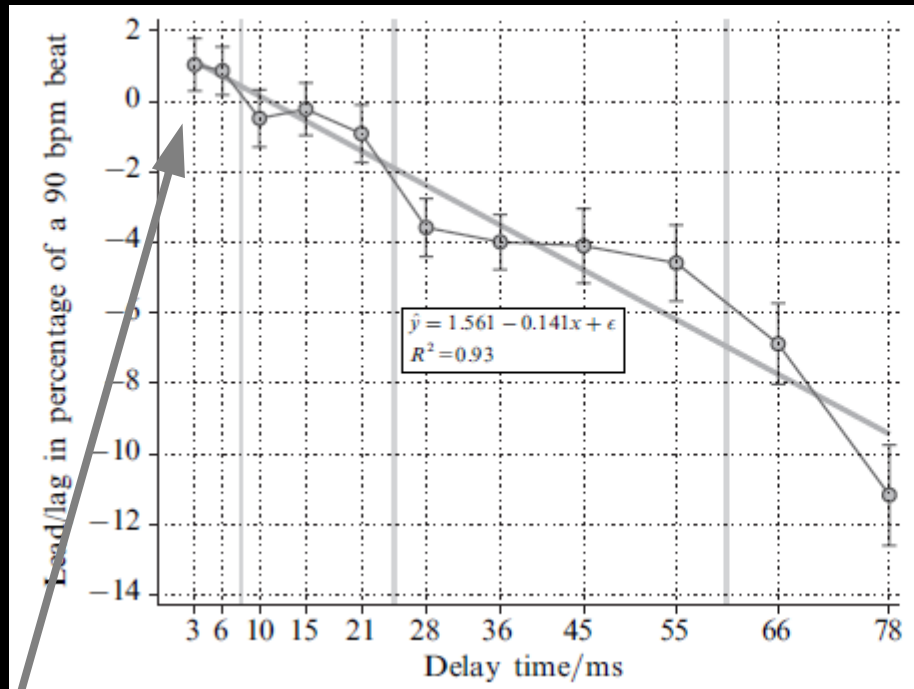


Figure 6. Onset asynchrony measured at all beat points for the set of delay conditions. At very small delays, performances are dominated by a tendency to lead (positive values). Increasing delay traverses two 'plateaus': first is the region with best synchronization, followed by a second plateau beginning at 28 ms delay. At the greatest delays, lag increases dramatically (negative values).



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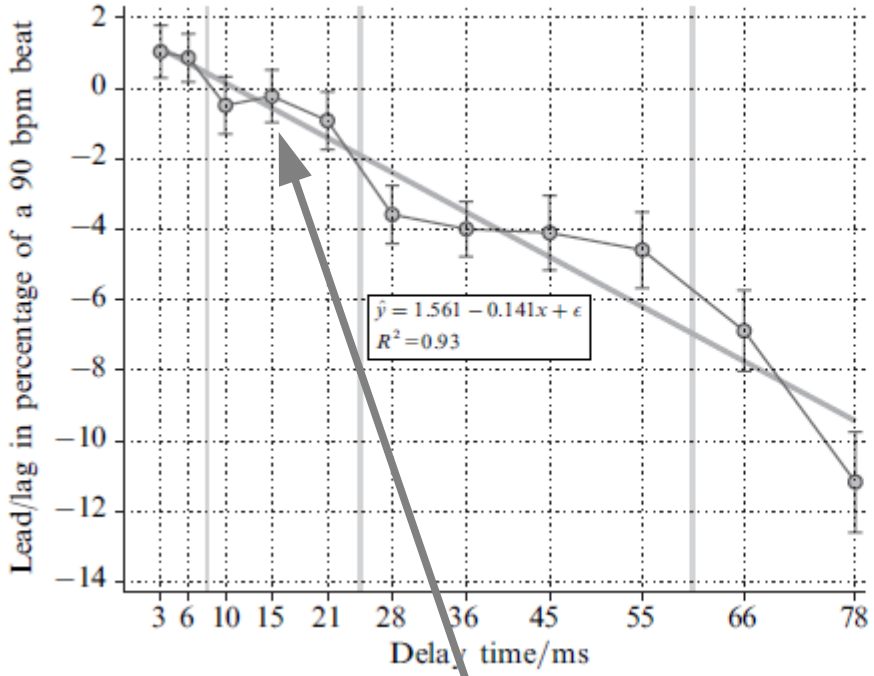
Zero delay is not zero tempo change...

Acceleration!



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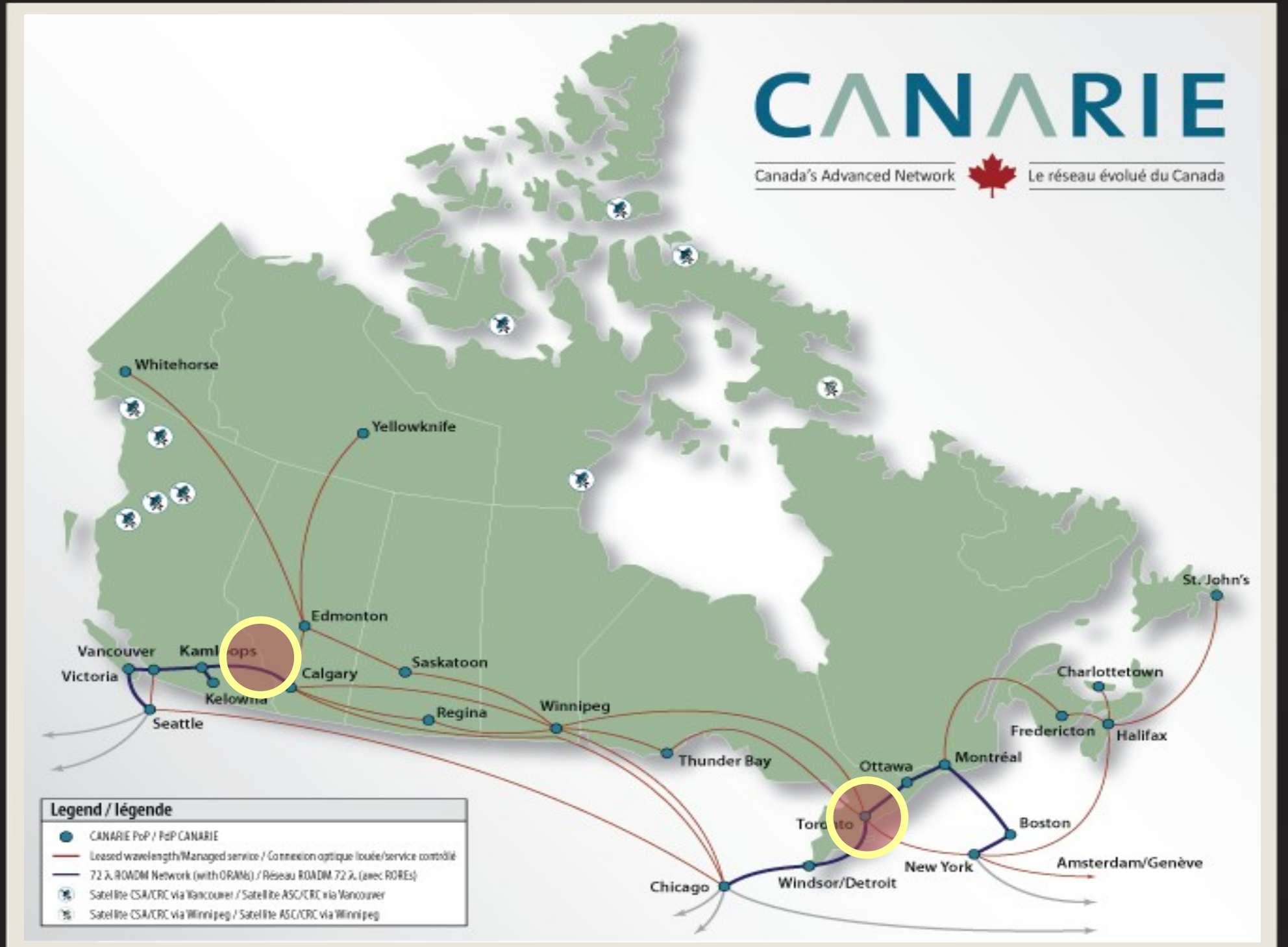
Sweet spot?

(Mommyheads, again) – one bar, slowed and looped

jacktrip software uncompressed


CANARIE
Canada's Advanced Network
Le réseau évolué du Canada
Whitehorse
Yellowknife
Edmonton
Vancouver
Kamloops
Victoria
Calgary
Saskatoon
Kelowna
Regina
Winnipeg
Seattle
Thunder Bay
Ottawa
Montréal
Toronto
Boston
New York
Chicago
Windsor/Detroit
Amsterdam/Genève
St. John's
Charlottetown
Fredericton
Halifax
Legend / légende
CANARIE PoP / PdP CANARIE
Leased wavelength/Managed service / Connexion optique louée/service contrôlé
72 λ ROADM Network (with ORAMs) / Réseau ROADM 72 λ (avec ROREs)
Satellite CSA/CRC via Vancouver / Satellite ASC/CRC via Vancouver
Satellite CSA/CRC via Winnipeg / Satellite ASC/CRC via Winnipeg


CANARIE
Canada's Advanced Network
Le réseau évolué du Canada
Whitehorse
Yellowknife
Edmonton
Vancouver
Victoria
Kamloops
Kelowna
Calgary
Saskatoon
Regina
Winnipeg
Seattle
Thunder Bay
Ottawa
Montréal
Toronto
Chicago
Windsor/Detroit
New York
Boston
Fredericton
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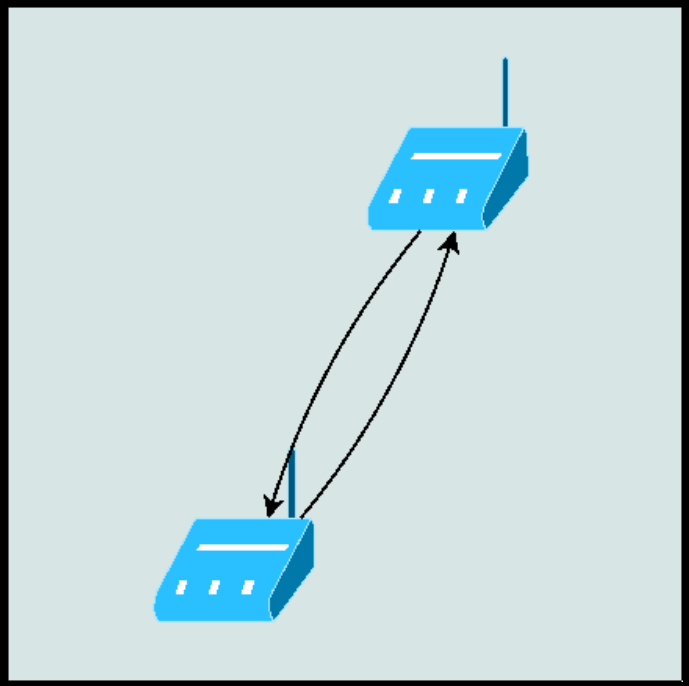
YAMAHA
YAMAHA
DRUM

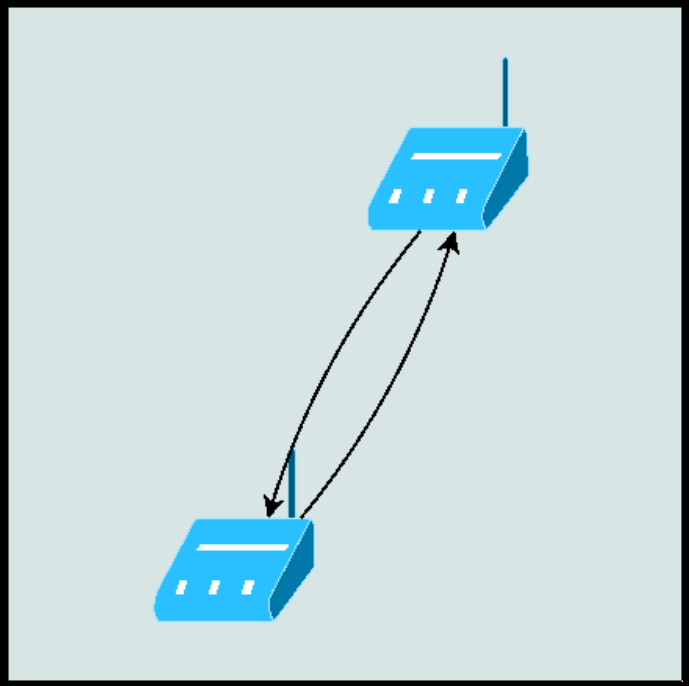

YAMAHA

jamLink hardware

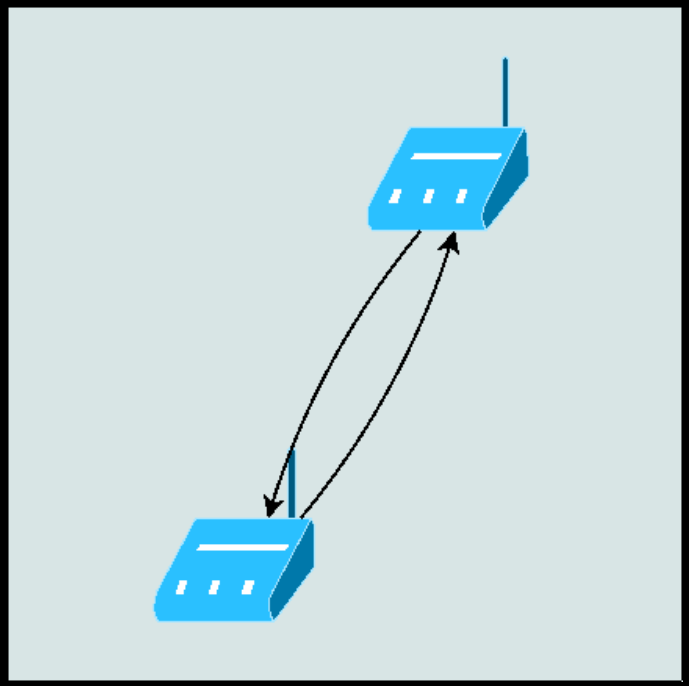
Stanford and Berkeley



Stanford and Berkeley



Stanford and Berkeley



turn-taking
vs.
sync

turn-taking
vs.
sync

...final take-away:

turn-taking

vs.

sync

Thanks!