

Distributed Immersive Performance

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The goal of Distributed Immersive Performance (DIP) is to allow musicians to collaborate synchronously over distance. Remote collaboration over the Internet poses many challenges such as delayed auditory and visual feedback to the musicians and a reduced sense of presence of the other musicians. We are systematically studying the effects of performing under remote conditions so as to guide the development of systems that will best enable remote musical collaboration. First, we present our current framework for the capture, recording and replay of high-resolution video, audio and MIDI streams in an interactive environment for collaborative music performance. Next, we discuss the results of user-based experiments for determining the effects of, and a partial solution to, latency in auditory feedback on performers' satisfaction with the ease of creating a tight ensemble, a musical interpretative and adaptation to the conditions.

Normal conditions (photo from www.tosheffpianoduo.com):



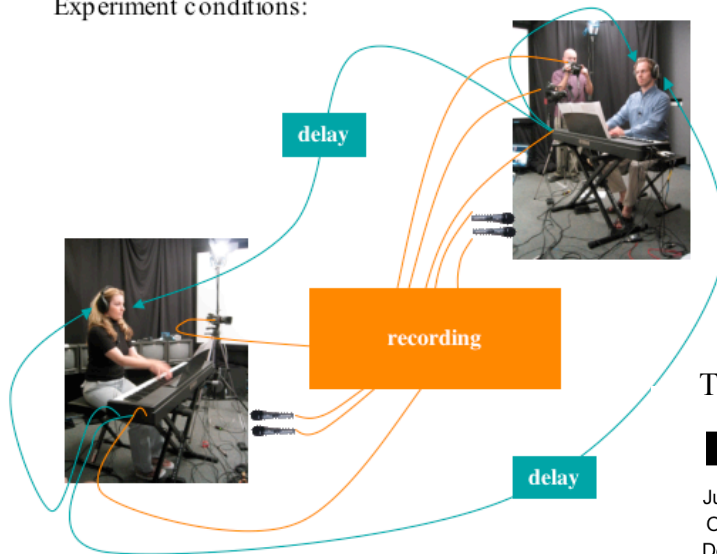
Website: imsc.usc.edu/dip

References:

Chew, Zimmermann, Sawchuk, Kyriakakis., Papadopoulos, François, Kim, Rizzo and Volk (2004). *Musical Interaction at a Distance: Distributed Immersive Performance*. In proceedings of the 4th Open Workshop of MUSICNETWORK: Integration of Music in Multimedia Applications, Barcelona, Spain.

Sawchuk, Chew, Zimmermann, Papadopoulos and Kyriakakis (2003). *From Remote Media Immersion to Distributed Immersive Performance*. In Proceedings of the ACM SIGMM 2003 Workshop on Experiential Telepresence (ETP 2003), Berkeley, California.

Experiment conditions:



Timeline of experiments:

2002	
Jun	Remote Media Immersion (RMI) Initial Demonstration
Oct	Internet2 Meeting: Large Room RMI Demonstration
Dec	Distributed Immersive Performance (DIP) Experiment: Distributed Duet
2003	
Jan	Recording from Streams
Jan	DIP Experiment: Remote Master Class with New World Symphony
Jun	DIP Experiment v.1.0: Duet with Audience
2004	
Jan	Two-Way Live HD Streaming LA, Hawaii, Miami Experiments
Feb-Apr	DIP Experiment v.2.0: Two-Way Baseline User Studies (planning)
May	A: first time players perform under delayed conditions
	B: player 1 and player 2 swap parts (symmetry test)
	C: players practise to compensate for delay
Jun	D: both players hear themselves and each other with delay

The New York Times
ON THE WEB

October 5, 2004

**Broadway Pit Shrinks;
Drummer Is Sent to Room**