Disklavier – Concert Grand Piano

Overview

The Disklavier concert grand piano is a pedagogical, performance, and research tool. Made famous through projects such as Elton John's *Concert Around the World*, the piano combines traditional instrument design with 21st century technology to enable unique musical experiences.

The piano is a beautiful acoustic instrument and can be used simply in that way. However, it also contains technology to record precise information on the timing and velocity of every keystroke and pedal press during a performance. This data can then be analyzed offline in order to address questions such as how novice and expert pianists differ, how different pianists convey emotions, and where errors tend to be made. In addition, the recorded information from a prior performance can be fed back into the piano such that the keys and pedals are pressed mechanically with the timing and velocity of the original performance, thus recreating the performance in the absence of the pianist. Unlike electronic pianos that play a recording each time a key is depressed, when the Disklavier plays back, the actual keys and pedals of the piano are pressed, which causes the hammers to hit the actual strings on the piano, reproducing the performance as in the original.

In addition, the piano can be connected to the internet and linked with other Disklaviers worldwide for performance and teaching purposes. Thus, a pianist could play a Disklavier piano in another city, the information on the timing and velocity of the key strokes transmitted over the internet and fed into our Disklavier so that an audience in the LIVELab could experience the performance.

Our staff will assist in reviewing a research design to ensure you get the most out of your LIVELab experience.

All research conducted in the LIVELab is subject to appropriate ethics approval and secure data handling.

Research Examples

- Composition and performance analysis
- Comparing audience responses to live and virtual performances
- Virtual playing via remote control
- Studying fine motor control

Technical Specifications and Software Output

- Make/Model: Yamaha Disklavier DC7 Mark IV PRO Concert Grand Piano
- Input/Output: recorded digital files (MIDI, .fil Yamaha enhanced MIDI), or real-time digital feeds (MIDI, USB, Network)

Technical Synchronization

All technologies included in the LIVELab are built to interact with each other.

Frequently Asked Questions

How does the Disklavier compare to other MIDI pianos?
The Disklavier is unique to other MIDI pianos in its ability to record high precision timing and velocity information on key strokes and pedals, and to play back the performance through movement of the actual piano strings as opposed to computer generated sound from a speaker, as is typically done with other MIDI pianos.

Where else are there linked Disklavier pianos?
There are a number of Disklavier pianos around the world, including at the Royal Conservatory of Music in Toronto.

What is the typical delay during remote control?
The Disklavier is a real-time technology with little delay. However, if the piano is being controlled across the internet there are inevitable network delays. The network data transmission application developed by Yamaha allows the piano performance data to be resynchronized with the delay of a live video or audio feed.