cybird cybird

for solo piano and multimedia

Nina Whiteman

2022

cybird cybird
for Zubin Kanga
Nina Whiteman (2022)

Duration: 12 minutes

Performers: 1 pianist, 1 sound engineer/technician

Instrumentation/technical resources:
>Piano
>Stereo PA system, preferably including sub woofer
>Projector and screen (as large as possible)
>Movesense sensors: two, one attached to each wrist of the pianist, like a wristwatch.
>Two devices with Holonic Systems and MiRack apps installed (e.g. iPhone and iPad): each one of these devices is linked to *one* of the sensors. Audio output from each device goes to main mixing desk.
>Laptop/computer: to play fixed media audio and video. Audio output to main mixing desk.

You will also need:
>This score
>MiRack RH patch on device 1 (this device is linked to RH sensor)
>MiRack LH patch on device 2 (this device is linked to LH sensor)
>Fixed media file containing audio and video

Programme note:

cybird cybird is the second in a triptych of multimedia works created as part of Zubin Kanga's UKRI-funded Cyborg Soloists project.
<mark>NEED TO FINISH LATER AGH!</mark>
With thanks to Zubin and the team!
Thanks to Holonic Systems? Anyone else?

The Cybird Trilogy
I. *Fuming (voice and multimedia, 20 minutes, 2022)*
II. *cybird cybird* (piano and multimedia, 12 minutes, 2022)
III. *Incandescent* (trio and multimedia, 15 minutes [in progress] 2022)
Fuming grew from my feelings about crossing a busy 'arterial' city road to reach my local park every day. I recorded this soundwalk dozens of times, capturing the impact of the traffic on the acoustic environment, as well as the sounds of birds jostling to live alongside this anthropogenic noise. This 'data' was then fed to the Sample RNN computer by Dr Christopher Melen at the RNCM, who sent me a range of results. The machine had learned a variety of sonic features of my daily walk. Unsurprisingly, though, it couldn't make qualitative judgements between 'bird' and 'car', and some interesting sonic hybrids emerged. These, along with 'uncanny' machine-learned environments form the basis for the fixed media electroacoustic audio in *Fuming* and *cybird cybird*.

Research tells us that birds find it harder to learn their songs against a backdrop of traffic noise, and that their songs tend to occupy a narrower and higher bandwidth as a result of these stresses (e.g. Drooling and Popper, 2007 and Moseley et al, 2019). I

began to imagine birds as hybrids of technology, flesh, feather, and imposing chaotic environment. The *Birds Aren't Real* conspiracy claims (satirically) that all birds have been replaced by robot drones. I began to wonder what it would be like if they had. *The Cybird Trilogy* of multimedia works with live performers has grown from this engagement with machine learning, artificial intelligence and the natural world, and charts the 'adventures' of a cybird character that is inhabited and portrayed differently in each work. Its concerns are ecological, musical, and technological.

Setting up the sensors with Holonic Systems for the first time:

1) Select a device to be device 1 (e.g. phone or iPad)
2) Install Holonic Systems app (Holon.ist)
3) Open Holon.ist
4) Tap the three lines at the top of your screen to access a drop-down menu
5) Under 'Sensors', ensure 'Movesense' is activated (move switch to right if not)
6) Click on 'Movesense'. You will be able to see the serial number of any saved devices.
7) Tap the two metal screws on the back of the Movesense sensor simultaneously. A red LED flash should appear on the front.
8) Follow on-screen instruction on your device 'pull down to start scanning'
9) The Movesense sensor serial number will appear. Click on it, and select 'Pair'.
10) Your sensor is now connected, and you will be able to see the battery percentage.
11) Click again on the three lines at the top of your screen, and now select (under 'Sensors') 'Values'.
12) Move the sensor around, and the gyro activity bars will show the motion. This means the device is receiving the data from the sensor.
13) Install MiRack on your device.
14) Load the RH patch. It should play automatically, but if not, the play button is located at the top right of the screen.
15) Note that the patch titled 'Holonic Source' is receiving the signal from your Holon.ist app: LEDs on the left-hand-side should flash red.
16) Attach the sensor to your right wrist (e.g. with clip or watch attachment), with 'MOVESENSE' text the correct way up when you read it as though it is a watch. This latter point is important and affects the correct functionality of the MiRack patches.
17) If you experience any problems with communication between the apps, close them and reopen them, and as a final troubleshooting option, turn off the Movesense and Unpair (Holon.ist: sensors > movesense; click on serial number; select 'unpair') before re-pairing and following these instructions again.
18) Repeat these instructions for Device 2, and the sensor to be attached to the left hand.
19) It is recommended that you label one of the sensors with masking tape and R or L so that you can readily know which one belongs to which wrist.

Setting up the sensors for practice/performance (to do on each device):

1) Open Holon.ist
2) Sensors > Movesense
3) Pull down to scan, and the app should automatically talk to the sensor
4) Go to Sensors > Values to check communication
5) Open MiRack and check the sensor is registering there. If it isn't try closing and opening the app again.
6) Once operational, attach sensor to wrist
7) Repeat for Device 2

Uses of technology:

Holonic Systems (via the Holonist app) allows Movesense motion sensors to communicate with various software. The motion sensors are used to convert bird-like performer wing movements into audible phenomena, through control of playback speed (MaxMSP) and of a modular synthesiser app (MiRack).

Holly+ https://holly.plus/ Holly Herndon's voice model (deep neural network) was used to process real birdsong recordings. These feature in the in-ear soundtrack of *Fuming* and in the electroacoustic sound of *cybird cybird.*

AI images of birds were created for the videos using DALL-E mini, and later Craiyon.

AI videos were created using online generators such as Synthesia and Movio.

An analogue **talkbox** features in *Fuming*, where the output of the motion-sensor controlled modular synthesiser is fed into the performer's mouth. Their mouth filters the noisy emissions, amplified by a microphone.

Fuming was first performed at the International Anthony Burgess Foundation, Manchester alongside other work created by the Machine Learning for Music (ML4M) working group in June 2022.

cybird cybird will be performed by Zubin Kanga in Sheffield on 8 October, and at Cafe Oto (London) on 13 October.

Incandescent will be performed for the first time at the University of Manchester lunchtime concert series on 10 November by Trio Atem.

The trilogy results from my work on Zubin Kanga's UKRI Future Leaders project *Cyborg Soloists*. I'm grateful to Zubin for commissioning me to work on this fantastic project using new technologies: https://www.cyborgsoloists.com/

With enormous thanks also to Stephen Bradshaw for his assistance with MaxMSP programming for *Fuming.*

And also need to credit Freesound!