Echometrie

For solo violin and live electronics

Sarah Angliss
for Muriel Oberhofer
and Royal Academy of Music 200 Pieces 2021

Echometrie

About this piece

I wrote *Echometrie* as a solo piece for violinist Muriel Oberhofer after she spoke about her love of walking in mountains and her interest in playing music with a high degree of consonance. Our conversation reminded me of a vinyl record *Echo Vom Königssee* I'd found a few months earlier. It was an oddity sold to tourists in the 1960s. The record featured an anonymous solo trumpeter playing on a boat in lake Königssee. As the trumpeter played, the music echoed brightly off the surrounding mountains.

I'm fascinated by the ways in which echometrie - the study of echoes - bridges early ideas in music and acoustics. While musicians were performing echo fantasias in the 17th century, natural philosophers were trying to fathom the nature of the echo through geometry and visits to extraordinary sites like Königssee. Marin Mersenne introduced the term 'echometrie' in his wide-ranging 1636 treatise *Harmonie universelle contenant la théorie et la pratique de la musique*.

On a personal note: this piece was written during the Covid lockdown of 2021. I can hear the echoes of that time in the score as it's slow and sectional, just like my cognition at the time, as I was wrestling with the effects of brain fog (due to long Covid). Nevertheless, I hope players find *Echometrie* interesting piece.

Tech requirements

In addition to your violin you will need:

1   An instrument mic to pick up your sound as you play. We used a large-diaphragm condenser close to Muriel, pointing towards her violin. You could alternatively use a condenser mic that clips onto your instrument (e.g. a DPA 4099 with a violin clip).
2   A Mac laptop*, a soundcard with a mic input and a stereo PA system.
3   A copy of Ableton Live 11*.
4   A download of the software available at www.sarahangliss.com/echometrie-tools. This includes an Ableton Live* session, featuring bespoke Max4Live patches.
5   A midi footswitch - one that simply switches on or off, rather than offering continuously varying output. Make sure its action is as quiet as possible.

* In 2021 we performed this piece using Ableton Live 11 and Max4Live 8 on an Intel Mac running High Sierra, with a Fireface USB soundcard. The piece is adaptable to other setups - do get in touch if you have a particular request. On the website, I include a functional diagram of the electronics, in case there's a need to remake this piece using other software in the future.

Setting up the software

Connect your equipment

Connect your soundcard to your mic and PA. Then connect your soundcard and midi footswitch to your laptop.

Open up the Ableton Project **Echometrie S Angliss 2021.** In Ableton Preferences, select your soundcard as input and output. Enable the footswitch as one of your midi inputs.

Set up Track 1

Track 1 of the Ableton project is called **Violin - verb on quiet.** This track sends your mic signal to your PA, via a low-pass filter, compressor and reverb. Ensure the inputs and outputs of this track are set to your mic and PA.

This track is set up rather like a side-chain effect as it's heard 100% wet. The goal is to ensure only the quietest sounds (e.g. the echo in bar 22) are heard with a bloom of reverb and that almost no reverb is discernible on the mezzo-forte sounds. The compressor is the element in this track that optimises this effect. Adjust the threshold of the compressor to suit the particulars of your violin, mic and room. You can find the ideal threshold by playing and listening to the results. Also tweak the track volume to make this a subtle effect. Ideally you should hear almost no reinforcement of the live violin, apart from this reverb.

The low-pass filter is used to enhance the feeling that we are listening to reverberant sounds coming from far away. This should also only be a subtle effect - you can tweak the cutoff filter frequency to suit your own setup and room. Please don't set the cut-off frequency so low, the echoes sound muffled.

Set up Track 2

Track 2 of the Ableton project is called **PedalListener.** Thus includes the Max4Live patch this **pedalCounterWithManualIncDec** which counts your momentary footswitch presses. It assumes the footswitch sends out data on Midi Controller 64. If your pedal uses a different controller number, you can set this using the yellow box in the bottom right-hand-side of the screen.

To reset the pedal count: click on the red button or by holding the pedal down for more than 3 seconds.

To jump to particular pedal count during rehearsals, type it into the white box and press the small brown button to the right of it.

You can also adjust the pedal count manually, by one or more counts, using the green and pink butttons.

Set up Track 3

Track 3 of the Ableton project is called **Violin echoes**. It includes the Max4Live patch **echometrieM4LSarahAnglissOct2021**. This M4L patch captures three phrases at the opening of the piece then introduces them back into the piece, sometimes with layering and time stretching.

Here are the functions of this patch in sequence (all timings are approximate - the piece is con rubato). There's no need to memorise this list as the patch moves through the sequence automatically:

0   Clears the buffers of earlier sounds and resets the parameters of all the effects.

1   Starts recording the first phrase (bar 1)

2   Stops recording the first phrase and starts recording the second (bars 2 and 3).

3   Stops recording the second phrase and starts recording the third (bar 4 and the first beat of 5).

4   Stops recording the third phrase.

5   Plays layered, timestretched versions of phrase 2 then 3.

6   Plays phrase 1 with a two crotchet delay.

7   Plays phrase 1

8   Plays back a fragment of bar 31 and 32, delayed by 2 crotchets.

9   Plays back a fragment of bar 34 and 35, delayed by 2 crotchets.

10   Plays back layered time stretched versions of phrase 3, 5 times, overlapping, each with subtly increasing time stretch.

11   Plays phrase 1

12   Plays phrase 1 with a one crotchet delay.

13   Plays layered phrase 2, phrase 1, layered phrase 2, phrase 1, layered phrase 3, then 3x phrase 1.


Interpreting the score

Before you begin, reset the pedal count to zero.
Play the piece live, ensurign the mic picks up your live sound and relays it to Ableton.

Laisser vibre wherever possible - quieter notes will automatically receive more electronic reverb, fue to the compressor in track 1.

When you see the x notehead, momentarily press the footswitch (and do not play the note shown).
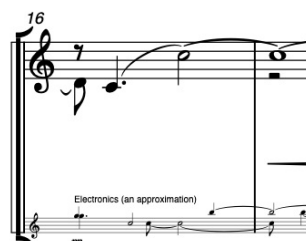
The small lower stave shows what you'll hear from the Ableton patch (this is an approximation).

Experiment with levels to get a good echo effect. The echoes should be strong enough to overwhelm the live sound in the loudest sections.

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RAM 2021

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SCORE TO BE USED WITH LIVE ELECTRONICS - SEE NOTES

legato con espressivo, quiet but bright and clear
laisser vibre wherever possible - quieter notes will automatically receive more electronic reverb