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Title:

The drum machine's ear: XLN Audio's drum sequencer *XO* and algorithmic listening

Bio

Malte Kobel is a TECHNE/AHRC-funded doctoral student in Music at Kingston University London. His PhD project attempts a theorisation of the singing voice from the perspective of listening: working through philosophies of voice, musicology, media theory and sound studies. Malte has studied musicology at the University of Vienna (BA) and at Humboldt-University of Berlin (MA).

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Information

XLN Audio: *XO*, 2019; <https://www.xlnaudio.com> (179,95€, and 10-day free trial),

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In 2015 I spoke to producer Stefan Goldmann about the ideologies of music production and the use of presets.¹ In our conversation, Goldmann mentioned a video that shows the EDM producer Avicii in his studio: Tim Bergling (Avicii) stares at his screen and plays around with a melody in his Digital Audio Workstation (DAW).² He says he wants the melody to be played in an “obnoxious, in-your-face type of sound”: he loads his Fruity Wrapper VST plug-in into Fruity Loops and shuffles the melody through all the different preset synthesizers to tweak and ultimately find the ‘right’ sound for the melody (cf. Future Music Magazine 2012, min. 03:50).

The speed with which Bergling clicks through the preset synths is quite spectacular, but his method of working is far from unusual in the realms of audio production. I have always been fascinated by this video and Bergling's approach because of the way his listening becomes part of the process of production. I am fascinated by the fact that this environment of the DAW affords such programming; it brings about a process of production that somehow *performs* a specific listening.³ Such listening can be called programming by ear, and it can easily be read as a specific “audile technique” (Sterne 2003), a specific kind of listening constituted by the confines and structures of digital audio software.

I was reminded of this video and this notion of programming by ear when I played with the drum sequencer XO designed by the Swedish music software company XLN Audio. XO is a VST plug-in drum sequencer that promises to be the “perfect companion” to your drum programming workflow (XLN Audio 2019). Unlike ‘classical’ drum sequencers (think of the design of Roland's TR-808 or TR-909), XO does not offer itself visually as a linear sequencer. Instead, when you open XO, it lets you gaze into a clear night sky filled with red, yellow, green and blue little dots, aptly called SPACE.

¹ Goldmann had just published his collection of interviews on the topic: *Presets - Digital Shortcuts to Sound* (Goldmann 2015).

² Cf. Future Music Magazine 2012; the interview with Stefan Goldmann was published in *Das Filter*, cf. Kobel and Goldmann 2015.

³ Bergling says: “I’ve never been very technical at all [...]. [But] if I tweak this [moves the cursor of the mouse; MK] it sounds good, I’ve always been [working] more like that”; i.e. intuitively and by ear (Future Music Magazine 2012, min. 24:20).



Figure 1: Screenshot of XO's SPACE perspective

What is XO?

XLN Audio promises its user a new and fast way of selecting and arranging drum sounds by visualising several drum packs and grouping them in one central place.⁴ What makes *XO* interesting is not primarily its interface design, but that it taxonomically organises drum sounds into SPACE's field of colourful pixels. The machine learning algorithms running in the background analyse all audio files and cluster them according to timbral similarity: boomy kick close to a similarly boomy kick, bouncy tom next to a similarly bouncy tom etc.⁵ *XO* then functions by way of approximating sounds according to their timbral morphologies. Such taxonomising of sounds lets us initiate a meeting between Avicii, Pierre Schaeffer and Sound Studies more generally. In the late 1940s, Schaeffer spawned the project of *musique concrète* not only to compose music by recording and manipulating sound, but similarly to develop a whole system or taxonomy of sounds (Schaeffer 2017). Schaeffer's vision of theorising musical and sound objects relied fundamentally on the development of extensive listening practices (by way of reduced listening and the sound object). His sound theory in other words can be read as a pedagogy of listening, a way of disciplining the audible and as such, as Nina Eidsheim would argue, functions to re-affirm and establish certain concepts of sound, music and listening (Eidsheim 2015). Arguably, musical practices have always done such disciplining and organising of our listening capacities, as has the discourse around it (Musicology and Sound Studies). Furthermore, our listening has historically been organised

⁴ The drum sampler *Atlas* released in 2018 by Algonaut already promised to change the processes of drum sequencing by similarly visualising drum packs. Like *XO*, *Atlas* works with a machine learning algorithm that analyses and orders drum sounds "based on style and character" (cf. Algonaut 2018).

⁵ It might of course be interesting to know how the algorithm discriminates and functions: is it timbral characteristic, style, genre, intensity or morphology of a sound sample that structures the ordering?

by musical instruments and audio technologies (Sterne 2003). So, what is new, *XO*? Why pay attention to a specific digital drum sequencer?

Arguably, because we are confronted here with a specific form of listening which is no longer just a programming by ear but a form of algorithmic listening.⁶ Even before I have programmed any drums in the sequencer, *XO* has sorted and organised all my samples and therefore listens to the sonic material before I do, but it does so with a set of 'ears' that have been programmed according to (an almost Schaefferian taxonomy of the) morphological characteristics of sound (such as timbre, intensity, mass etc.). *XO* guides our programming by determining which samples I hear and how they each relate to one another: like Avicii, I am programming by ear, but those ears of mine are ensnared by *XO*'s a priori algorithmic organising of sound. Are we then listening to and with the algorithmically tuned ears of the software, in collaboration with it or is there a division of labour happening? Who listens to whom and what are the producer and the machine each listening to and for?

Algorithmic listening

When my ears guide my cursor through *XO*'s SPACE and my index finger clicks through the thousands of snappy drum samples who all conjure a thousand different musical genres and styles, I can't help but surmise that what goes on here is already an elaborated form of listening pedagogy à la Schaeffer.

While I click my way through *XO*, the many different drum sounds and their intricate timbral differences, the Avicii scene comes back to my mind: how I am flicking through indeed hundreds of sounds in just a few minutes, quickly resting at some, brushing over a thousand others, then adjusting and placing a snare within my drum set etc. Such skimming way of working is far from novel in the world of sound production, but with a tool such as *XO*, I outsource certain decision-making processes to the analytical organising by the machine learning algorithm: it presents me with an automated approximation of timbres, sound characteristics and morphologies of samples. Our tasks are split: the software organises the samples and thus guides my choices, my hearing and production. I'm merely left doing the sound picking, curating and timbral fine-tuning. In a sense, *XO* asks us to reflect the hierarchical roles of musician, producer and technology. But more interestingly, it brings forward questions of rhythmical and timbral aural engineering. Rhythmically engineered we are making beats together with our "perfect companion", a timbrally fine-tuned algorithm called *XO*.⁷ My listening (as selecting, curating and programming) follows an *a priori* analytical listening performed by *XO*'s machine learning algorithm.

Why should such a programming by (algorithmic) ear be of interest to the field of Sound Studies? Have we not in this field already established that sound technologies inform and

⁶ Algorithmic listening and machine listening are both terms that are beginning to circulate in the fields of sound and media studies, cf. Miyazaki 2013; also cf. the research network 'Humanising Algorithmic Listening' (<http://www.algorithmiclistening.org/>) and Technosphere Magazine's special issue on "Machine Listening" ('Machine Listening' 2018).

⁷ Cf. The neologism rhythmachine stems from Kodwo Eshun's writings in *More Brilliant Than The Sun* (Eshun 1998) and might denote a rhythmic feel/knowing/doing/grooving specific to the drum machine; also see Malte Pelleter for a further theorisation of the notion of the rhythmachine (Pelleter 2018).

train our listening and our understanding of sound as such? Certainly, but I think that reflecting on such automated organising of sound and listening allows us to critique hegemonic formations of sound and listening and allows us to trace herein embedded epistemic regimes of genres, styles, musical traditions, cultural and social ways of sounding and listening.⁸ Algorithmic listening, as performed by and in collaboration with *XO*, reminds us once more how sound and listening are anything but innocent objects of ontological speculation but are instead always part of aesthetic, political and epistemic realities.⁹

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⁸ *XO* functions here of course only as one example of such algorithmic listening and organising of sound: we might furthermore think here of algorithmic listening that is performed in streaming platforms such as Spotify, automated mastering tools such as Landr or more generally preset sounds in DAWs.

⁹ Cf. Thompson 2017 for the debate around sonic materialism and ontologies of sound which have been happening in the fields of sound studies more recently.