Hearing Aids: Flusser’s Gesture of Listening Reconsidered

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Vilém Flusser has been most influential with his seminal work on the techno-imaginary. However, several of his essays on composition, sound and listening show the significance that music had for his thinking. Thanks to Annie Goh, one of the editors of *Flusser Studies 17,* two of Flusser's important early manuscripts on music and sound have recently been translated and published. Flusser wrote these lectures, entitled *On Music* and *On Modern Music*, in 1965 (Flusser 2014a; Flusser 2014b), at a time when the very concept of western music had been seriously challenged by the post-WWII avant-gardes. Today, in the aftermath of the massive digitization, algorithmization and cybernetization of almost all aspects of western society, culture and politics, Flusser’s gesture of listening, as we argue in this article, might be more relevant than ever.

In the following, we will therefore firstly contextualize Flusser's thoughts on the “Gesture of listening to music” (Flusser 2011a: 21–23)[1] by drawing upon his concept of “Pure music,” (Flusser 2014a: 3; Flusser 2014b: 1) “Chamber music” and “Cybernetic dialogue” (Flusser 2011b: 159–167). Secondly we will intertwine these with his account of the “Hearing aid.” (Flusser no date) Thirdly we will focus on what we call parasitic gestures of listening in the sonic arts, and fourthly synthesize the gesture of listening with Flusser’s *Vampyroteuthis Infernalis* (Flusser 2011c)[2], a rarely discussed monograph, written mostly in 1981[3] and which touches neuroscientific, biological, cybernetic and ecological aspects of media. As conclusion, we will present exemplary gestures of deep listening or auscultation of mainly technical networks. Extending Flusser’s gesture of listening to the micro-temporality of technical networks might lead to an alternative perspective on media performance as well as on sonification strategies.[4]

Pure Music – Chamber Music

A recurring concept in Flusser's writings on music and sound is the notion of "Pure Music." Flusser relates this term to the advent of the modern age and considers its importance equal to that of science and technology. (Flusser 2014a: 3) Flusser's concept of "Pure Music" is rooted in Schopenhauer's aesthetics and his views on music's cognitive significance. In Schopenhauer's theory, first-personal aesthetic experience is carried out by a "pure subject of cognition" (Schopenhauer 2010: 202). The subject having aesthetic experience is pure insofar as it is temporarily free from causally determined reasoning and individual needs. Schopenhauer accordingly associates aesthetic experience and artistic production with the freedom of the intellect from the dynamic pull of the striving self. It is this freedom from ordinary egoism that allows for an intuitive knowledge and understanding. As music exemplifies this kind of understanding, it has the most esteemed position in the hierarchy of the arts in Schopenhauer's system.

Bypassing mimesis and representation, music does not have to copy the essential features of the phenomenal world, but, according to Schopenhauer, directly reflects the unknowable thing-in-itself, the noumenal realm of active drives, urgings and strives he calls "will." (Schopenhauer 2010: 360) Will and representation are antagonistic concepts in Schopenhauer's metaphysics. While all other arts have to express ideas qua representations, music appears to be a direct reflection of will. Lending music such a significance is what made Schopenhauer the musician's philosopher of the 19th and early 20th centuries. Relevant in this context is how Schopenhauer's notion of music was formative for Flusser's idea of "Pure Music."

In his lectures on music from 1965, Flusser leaves no doubt about Schopenhauer's influence. He regards music as the "immediate articulation of the intellect. It means nothing, but it expresses directly the structure of thought" (Flusser 2014a: 4). Music and mathematics are regarded as analogous to pure thought itself. Its pureness is to be found in its non-figurative, structural and logical condition: "Mathematics is pure language and so is music. The same rules that order concepts within thought (the rules of grammar), and that order the algorithms (the rules of logic), also order the notes on a musical score" (ibid.). Flusser points out that, in fact, "many modern scores should be called programs" (Flusser 2011b: 163). Music, being the embodiment of such a program, eventually becomes a universal cybernetic metaphor for Flusser and he comes to regard music not only as an auditory phenomenon, but also finds musicality in abstract painting or generative synthetic art. In *Chamber Music*, the concluding chapter of his 1985 book *Into the Universe of Technical Images*, Flusser goes on to ontologize technical media with and against Schopenhauer's musical metaphysics:

> Technical images are pure art in the same sense that music alone once was. The universe of music is as calculated and computed as that of technical images. It is true that technical images are calculated and computed representations and

> belong in this sense to Schopenhauer's world as representation. But […] the universe of technical images is reminiscent of many things about the musical universe. […] Like the musical one, it is a pure universe, free of any semantic dimension (ibid.: 165).

How can technical images possibly be both representational and free of any semantic dimension at the same time? Here, Flusser addresses the underlying structure of technical images, their computed or electronically programmed pattern, which is reminiscent of the musical universe. It is of importance to keep in mind that what Flusser calls a program is not at all restricted to the digital, but would equally apply to the electronic video-image and even to the photographic mechanism. But Flusser is convinced that "[o]nce they have both become electronic, visual and acoustic technologies will no longer be separable" (ibid.: 165). He concludes his chapter on chamber music calling for a new consciousness in the emerging techno-aesthetic universe where everybody becomes a composer: "What this essay has tried to do is to relate a fable. It narrates a fabulous universe, that of technical images, a fabulous society, that of cybernetic dialogue, a fabulous consciousness, that of making music with the power of imagination" (ibid.: 167).

Flusser introduces a new focus, addressing not so much the program or network as such, but instead foregrounding its actors. Whereas he had called for a total confluence of music and pure mathematical thought in his lectures from 1965, twenty years later his notion of music turned into a fable of cybernetic dialogue, that is, activity and agency in cybernetic networks. "Pure Music" turned into "Chamber Music," which allowed Flusser to pose questions on physical embodiment and performance of human as well as machinic agents in favor of pure concepts. "Mathematics is not able to perform itself," emphasizes Wolfgang Ernst with regard to Flusser's early writings on music. (Ernst 2014) Computing does not happen with algorithms alone, but needs to be executed in time and by means of physical hardware. It is this particular material-temporal dimension of machinic agency and performance which we are able to experientially grasp when rendering the activity of technical networks audible.[5]

The Gesture of Listening via Hearing Aids

Flusser analyses the gesture of listening first and foremost in phenomenological terms and with regard to aesthetic experience, namely listening to music. During the course of his chapter on *The Gesture of Listening to Music* Flusser qualifies listening to music not so much a gesture, but more as a "posture" by which the body adapts to the perceived (Flusser 2011a). In fact, listening is not just regarded as an act of reception, but of endless transmission. Even when

we're receiving an auditory message, we're transmitting it within our body, because of its permeability towards acoustic waves. In accord with Michel Serres' theory of listening, Flusser points out that acoustic messages don't reach a final receiver in the listener's body, but resonate within endless layers of skin down to the eardrum and the basilar membrane (Flusser 2011a).[6] Therefore, listening to music can be described as a posture that focuses on sound in order to make it enter and resonate within the body. In other words, listening is an empathic gesture, insofar as the self becomes the music, diluted into vibration during the act of empathetic concentration. "It is only when one takes music back to acoustics and the mind to nerves and muscles that one sees the secret of pathos, the Orphic mystery." (Flusser 2011a: 23) From the anatomy of the ear, its physiology and neural processing, to the way it allows for conscious phenomenal perception and finally musical experience, Flusser treats listening as a cybernetic black box. Listening cannot be described in terms of massage or diathermy whereby a kind of spirit is stimulated by physical impulses. For Flusser "the matter of the permeability of the human body for sound waves is not so simple because it is experienced as happiness, mathematical order and beauty. No experience shows to such an extent as listening to music that "mind," "soul" or "intellect" are words that define physical processes" (ibid.: 22).

In an undated manuscript titled *Hörapparate (Hearing Aids)*, Flusser again addresses the entanglement of auditory experience and physical processes, but from a different point of view. He claims that "through hearing aids one realizes that sounds are instrumentalized," (Flusser no date: n.p) and argues that these devices help to develop an awareness and understanding of the underlying program of auditory perception and of communication in general. Hearing aids are described as second order entities that help to see how the ears provide phenomenal access to the world around us.[7] According to Flusser, the ear itself is the most fundamental hearing aid there is and he regards not only the technical hearing aid as programmed but the organic ear, too. It contains a program given by nature, an auditory grid forming a complex interface from signal to sound. (Flusser no date)

Flusser furthermore finds an advantage in the technical apparatus by comparison to the ear: the simple fact that the machine can be switched off. For Flusser, switching on and off the audible might also happen unnoticed by society, which implies a political dimension. With the hearing aid we no longer confront an environment that sonically invades and determines us, but instead we deliberately decide to intercept by switching on the circuit. Thus, hearing aids become devices for environmental wiretapping, constituting a parasitic gesture. We argue that sonification practices, particularly in experimental settings, are motivated by parasitic gestures of listening much more than by the wish for accurate representations via auditory displays. Hearing aids in the sense discussed above operate as transductive media, not yet in semiotic registers, they provide perceptual access to signal processes without providing useful representations. Representation belongs to human apperception, cognition and imagination. That is why Flusser differentiates the realm of technical images from the universe of non-

representational music associated with energetic activity and signal flows: “[T]he universe of technical images (the world as representation) sets itself before the universe of music (before the world as will) and covers it like a veil” (Flusser 2011b: 164). The veil of techno-imagination covers the signals acting within media. Accordingly, what parasitic gestures of listening might reveal is not representational as such, but “programmed noise,” in Flusser’s terms. (ibid.) In the case of natural signals, like electromagnetic emissions, the program is determined by non-human factors, and in the case of technical networks, the program is man-made, thus culturally determined. (Flusser no date: 3–4) This simple differentiation is meant as a spectrum, as man-made and non-human factors often play together.

A form of fishing - Parasitic Gestures of Listening in the Sonic Arts

Variations VII by John Cage was performed as one of the *9 Evenings: Theatre and Engineering* in 1966, and may serve as an example for the gesture of parasitic listening by using hearing aids in experimental music.[8] In the performance of this piece all sounds are received or generated live, without recordings, from telephone lines, radios, contact microphones on small appliances, broken light beams of photo-electrical devices and oscillators: “There were Geiger counters […], radios, there were telephone lines open to different parts of the city. There were as many different ways of receiving vibrations and making them audible as we could grasp the techniques at hand” (Cage 1966) Cage pointed out that “The air […] is filled with sounds that are inaudible, but that become audible if we have receiving sets. […] A form of fishing” (ibid.). Cage’s metaphor describes the parasitic gesture, with which centripetal musical listening hauls in all sound: “catching sounds from air as though with nets, not throwing out however the unlistenable ones [...] making audible what is otherwise silence therefore no interposition of intention. Just facilitating reception” (ibid.).

Variations VII was created under the impression of the première of Alvin Lucier's landmark experimental brainwave piece *Music for solo Performer* from 1965.[9] For this piece, EEG electrodes are attached to the performer's head in order to transduce bioelectrical processes in the brain –alpha wave activity– into electronic impulses used to activate percussive instruments. The instruments send sound to the audience and also back to the ears of the performer resulting again in bioelectrical activity in the brain. Thus, a closed circuit consisting of technical and human components is inscribed into the composition.[10] Listening and being listened to paradoxically interfere with each other, because the solo performer’s hearing aid (its sonification circuit) does not internalize the external world, but rather externalizes the internal world of neural activities. The poetic aspect of the piece lies in the antinomy of control by

losing control. Only when the performer lets go his or her deliberate control, alpha waves occur, are transduced and playfully routed within the circuitry to activate the instruments. The solo performer becomes a quasi-object within the network in order to be aesthetically performative. Eventually, Lucier's own presence on stage – his eyes closed, hand supporting his forehead – can probably be considered one of the most iconic embodiments of Flusser's gesture/posture of listening.

Steina Vasulka's audiovisual performance *Violin Power* from 1969, a work occasionally referenced by Flusser himself, shows how the universe of music enters the universe of technical images in form of disturbances and alterations. Vasulka feeds the electronically processed sound of her violin into a video image of herself playing and thereby explores the interference of different sound signals with the video pattern. Vasulka does not perform gestures of an expressive virtuoso, but on the contrary those of careful exploration in an unknown environment. Her audio signals modulate the horizontal synchronization of the image and the double exposure of two camera signals feeding the circuit. During the whole *mise-en-scène,* Steina Vasulka's image oscillates between representational self-affirmation and the dissolution of the self through the disturbing deflection of the video. Music gains conceptual meaning by physically invading the world of representation as energy of modulating force. Not only is Flusser's double character of technical images aesthetisized in this work (being world-as-will and world-as-representation at the same time), but Vasulka's deflected video portrait is also emblematic of the empathic gesture of listening.

Earth's Technosphere and Biosphere

Fifty years after the 1960s in the age of the *Internet of Things,* computational media have shrunk down to sizes on the scale of centimeters and at the same time proliferated across the planet, interconnected via vast networks of communication. The wirelessness of media technology has become a seemingly natural infrastructure in urban contexts. (Mackenzie 2010) (Eco)systems of media technology have gained importance on a planetary level, such that geologists and environmental engineers such as Peter K. Haff have begun to theorize them as the technosphere, a new man-made layer alongside the atmosphere, biosphere and lithosphere. (Haff 2012)

Flusser's concept of pure music *à la* Schopenhauer could resonate with the continuous signal processing operative inside this technosphere. Furthermore, not only the technical signal processes, but also the "biological drive," (Flusser 2011b: 164) the bioelectric signaling inside our bodies and brains, is reminiscent of Flusser's chamber music ensemble performing or improvising together via action potentials. The chamber music ensemble is a Flusserian

metaphor for communication systems in general, be it inside our brain, our body or be it distributed as a technical network over the planet. In the essay *Becoming Human*, Flusser mentions the concept of the cortical homunculus,[11] which he described as the "little brainman" (Flusser 1994: 181), and speculated about whether its proportions would change according to the media environment or – to use the terminology from "Chamber music" – according to the pure music the brain receives from the body parts and our perception.

Similar interest in neuroscientific matters is formulated in *Vampyroteuthis Infernalis,*[12] which deserves a more detailed examination. This lengthy "fable," as he calls it, was written mainly in 1981 and is a treatise on the vampire squid or vampyroteuthis infernalis – Latin for "vampire squid from hell" – a squid that lives in the deep abysses of the ocean, 600 to 900 meters or more below sea level. (Ibid.: 34) Flusser describes this fascinating, ancient, handless and thus gestureless animal. Instead of squid ink, it ejaculates a bioluminescent secretion. The main line of Flusser's argument follows his concept of the dematerialization of media technology, which he concretizes from the speculative and fictitious perspective of a squid:

> [T]he human is a sort of feedback loop through which data, gathered from out of the world, can re-enter into the world. But since the human organism (especially its brain) is complex, information is distorted during this feedback process. It is processed by the brain, which coordinates it reflexively and transmits it in a reconfigured form to the hand, by which it is retransmitted onto the world. In this sense, the data that humans cast back into the world represent new information. This new information is likewise perceived by the eyes, processed by the brain, and returned to the world in a restructured form. It is through this process that the human transforms both its environment and itself. In short: human history (ibid.: 49).

The squid goes on to explain:

> Humans are surrounded by a mixture of gases called 'air.' Most inhabitants of the air possess an organ that can cause this gas to resonate. Among humans, these resonances are codified and used, like our chromatophoric emissions, to transmit intraspecific information. Human memory is consequently designed to store information that is transmitted in this way. Compared to ours, however, its memory seems rudimentary, for the human is continuously reaching out for mnemonic crutches. It channels the majority of what it wants to communicate onto inanimate objects, which exist in large number on the relatively infertile continents, and these newly '(in)formed' objects are meant to serve as mnemonic aids. [...] Not only we vampyroteuthes but even a visitor from Mars could reconstruct human history from these entities. Since it is soaked up by objective matter, human history is not properly intersubjective. It is an utter failure (ibid.: 50).

Humans depend themselves on objective media, inscriptions of ephemeral emissions, whereas the squid hopes to become immortal through the memories of others. (Ibid.: 64) Written from the perspective of the squid these storage media appear as utter failure. (Ibid.: 38) Flusser argues, that with the dawn of telematic technology, we have begun to "vampyroteuthize" our society. The technosphere is changing towards more ephemeral, time-based and wireless modes of communication. Having "lost faith" in material media, humans in their utopian projections progressively introduce new ways of inter-subjective and immaterial communication, such as wireless technologies or brain-machine interfaces: "A vampyroteuthic revolution is underway" (ibid.: 65).

This ongoing tendency leads back to previous thoughts on chamber music and the gesture of listening. Human hands allow to act, gesture and actively come to grips with the world. The vampire squid's tentacles are more passive. Squids thus absorb the world. They receive signals and probably take the posture of a listener. Whereas we humans encounter problems and obstacles, the squid works around them, swallows and has impressions (ibid.: 39). The information directly im-presses and in-forms the squid's neural ecosystems. According to Flusser, media communication is increasingly approximating the ephemerality and liveness vampyroteuthic communication. The underlying technology of such real-time media is of course highly elaborated. Its technological complexity is hidden and unperceivable. Flusser presents his "vampyroteuthic revolution" in terms of a utopia of immediacy which strategically ignores the material scaffolding of the technosphere in order to steer the focus away from a static understanding towards a more dynamic, low-energy based view on machine-based planetary communications. This introduces the concept of a dynamic biosphere full of animal, plant, bacterial and viral communication, a sort of living media-techno-ecosystem.

Gestures of unveiling, which in Flusser's thinking are always connected with truth (Flusser 2011b: 164; Flusser and Bec 2012: 39), are transformed, through hearing aids, into gestures of listening. The hearing aid is an epistemological metaphor for media of transduction, making audible sound out, sourced from the realm of pure music, from human or non-human energy flows, from rhythmic drives and physio-organic signals acting and operating in bodies, objects, media and ecosystems of earth's techno- and biosphere.

Receptive and emissive modes of the listening gesture

The gesture of listening to pure music or chamber music in the Flusserian sense might be directed towards basically all measurable energy flows, rhythms, fluctuations in all sorts of systems and entities, especially so with the use of different kinds of hearing aids.[13] In order to provide a provisional, systematic approach to the wide range of possibilities and methods we

will differentiate between receptive and emissive modes of the listening gesture and their sociotechnical contexts. Emissive modes involve the active emittance of a signal that provokes some sort of wave reaction, reflection or echo, which is made audible, if it was not so already. Receptive modes do not require the emittance of signals. Examples for the emissive mode can be found in medical percussion, where the physician taps on the surface of a human body and listens to acoustic reflections with a stethoscope to determine the underlying structure. Percussive techniques have been applied in archaeology, too.

Augustus Pitt Rivers, famous as the father of British archaeology, describes how the pick was used to hammer on the surfaces of a site of interest (Pitt Rivers 1898). The character of the reflecting sound differs following structural aspects, volumes and materials.[14] Another early example of emissive listening can be found in underwater ranging, where a high-pitched or ultra-sonic ping is sent out and the time delay measured by a listener using headphones. In short, emissive listening is not only used for detecting topological structures under a surface such as the body skin, but also under the surface of the earth or oceans and seas. As media history shows, many of these auditory methods have been quickly replaced by imaging techniques, such as medical ultrasound, archaeological prospecting or underwater sonar.[15]

Receptive modes of listening work without emitting an impulse in the first place, but are directed towards actively signaling sources. Listening to bioelectrical activity in the muscles and nerves of animals such as frogs, dogs, cats and squids was done by using the speakers of a telephone for transducing these to acoustic fluctuations. (Volmar 2010) The telephone and the attached cables were also receptive for natural radio, very low frequency electromagnetic wave generated by lightning or other activities in earth's ionosphere. (Kahn 2013: 1) During World War I, soldiers listened for sounds from the airplanes to operate anti-aircraft systems, or for artillery sounds to target hostile locations. Other sound sources giving insight into hidden processes or inner workings are cars (Krebs 2012), mainframe computers, telephone or wireless networks (Miyazaki 2013a; Miyazaki 2013b), but also seismic activity from deep in the earth (Dombois 2011), and stars in outer space. Again, Flusser's distinction between given and culturally constructed programs implemented in these potentially sound-emitting sources helps to evaluate the corresponding gestures of listening as either analytic and pragmatic or speculative.

Historically, these gestures of listening have sooner or later been covered by the veil of technical images, as a result of sociotechnical conditions, questions of reliability, judgement and feasibility. The power of material-based memory, criticized by the fictitious vampire squid, led to the hegemony of diagrammatic and paper-based modes of representation. Bruno Latour called such storage media "immutable mobiles" or "inscriptions." Scientific reasoning is intrinsically linked to these material-based in-formations. (Latour 1986)

Play and Listen

We have synthesized a range of Flusser's sound related concepts and thoughts such as "pure music," "chamber music," the "hearing aid," and the "gesture of listening" with some of his more general concepts such as the technical image, the "little brainman" and the "vampyroteuthis infernalis." This created new interferences patterns, that enabled us to extend the gesture of listening into neuroscientific, biological, cybernetic and ecological aspects of media and the micro-temporality of technical networks. Flusser's notion of chamber music and cybernetic dialogue takes into account that the program, rule or algorithm embedded in media networks may become aesthetically productive within an infrastructure of experimentation. Within what Flusser calls the apparatus-operator complex, technical objects reveal themselves as a possessor of compositional force, putting categories of man-machine relationships such as control or agency into perspective. Relations between rational calculus and complex emergence, form and formlessness are to be exploited in a playful dialogue with the machine. What Cage called "going fishing for sounds" with reception devices (or hearing aids) relates very closely to what Flusser has to say about the acts of playing and creating in *Into the Universe of Technical Images*. He argues that "[c]reative inspiration only really becomes visionary power when it runs up against the raster of theory, as embodied in apparatuses" (Flusser 2011b: 103). Flusser observes a continuous play, which owes its productions to the dialectic between the program embedded in the technical object and the "intuitive hallucinatory power" of media practitioners (ibid.). In a telematic society, argues Flusser, where technical media are ubiquitous, this type of creative practice is potentially distributed amongst everyone to:

> test their intuitions and inspirations against the theories embodied in apparatuses, of whose riches we as yet have no inkling. This information will no longer comprise works, objects, but messages without substance, challenges to everyone to continually produce new information from them (ibid.)

Whereas we may remain skeptical of another proclamation of the vanishing work of art, Flusser is certainly convincing in projecting the advent of extended techniques of creation and the increasing production of signal-based information. In the present days of DIY-electronics and mobile devices, the according gestures of listening have become much more diversified as well.

The following practical examples show our application of sonification devices

Shintaro Miyazaki, "iphone music“ at Akademie Schloss Solitude in Stuttgart (2012)
https://vimeo.com/42990045

Shintaro Miyazaki, "detektors in Singapore“ (2012)
https://vimeo.com/51137320

Jan Thoben, „Re-scanning Moholy-Nagy's Sound ABC from paper“ (2015)
https://vimeo.com/114001563

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[1] See also Flusser 2014: 111–117

[2] See also Flusser 2012. We would like to thank Jamie Allen for pointing us to this valuable source.

[3] See preface in Flusser 2011c: 12

[4] Most of the examples discussed in this article fall under the term "audification," which refers to the raw transduction of non-audible into audible signals. For a terminological explanation see Dombois 2011

[5] For an analysis of computation in terms of micro-temporal rhythms see Miyazaki 2012; and Miyazaki 2016 (forthcoming)

[6] See also Serres 2008

[7] In this text Flusser strategically constructs a mutual relationship between hearing and seeing in terms of understanding.

[8] The piece does not have a score. Cage mentioned its conception in a letter to his collaborator David Tudor and in interviews.

[9] Cage assisted Lucier at the première and at a re-enactment in 1988.

[10] See also Douglas Kahn's discussion of Lucier's piece in: Kahn 2013: 83–92

[11] Developed by the neurologist Wilder Penfield in the late 1930s, a cortical homunculus is a pictorial representation of the portions of the human brain responsible for the processing and integration of motoric and sensorial information from different body parts.

[12] "How and where do our brain and central nervous system process data?", in: Flusser and Bec 2012: 45

[13] See also Miyazaki 2015

[14] As everyday experience tells us, wood resonates differently than metal.

[15] Other imaging tools that work with impulse-response techniques are radar, the electron microscope and even fMRI.

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