Mutable audible: an operative ontology of the sound image

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Introduction - Sound Images and the Constitution of the Audible

This thesis investigates the mutability of the audible. Rather than the diverse nature of the sonorous, it is concerned with the variable ways in which what is heard is formed. While the audible is most often addressed as inaccessible, residing in the inscrutable privacy of the mind, or as moulded by the wilful disposition of the listener, my project approaches the audible as contingently informed by collective, technical and material circumstances.

I pursue this investigation in a multifaceted way that comprises two series of written chapters and a body of four sound works whose documentation can be accessed in an accompanying online exposition.[1] However, and just to be clear, this documentation does not replace the sound works themselves, which are meant to be experienced in a live form, but is nonetheless useful in evoking fundamental aspects of each work.

[1] Accessible via this URL: https://www.researchcatalogue.net/view/1715830/1715831.

To account for the mutable constitution of the audible, I postulate a notion of sound image that draws on the reconceptualization of the image put forward by the French philosopher Gilbert Simondon. Founding the reconsideration of the sound image in the thought of Simondon is crucial. Simondon conceives of the image as a temporal operation that articulates the engagement of a sensing agent with its milieu. The notion needs to be unhinged from general uses of the term image, as well as from predominant modes of understanding what an image is, namely, those that identify the image as a pictorial representation or a mental entity.

The claim that there are aural images as well as there are visual images is not new, but this thesis addresses the question by embracing a concept of image in a post-anthropocentric context in which both mind and material artefacts are instances across which the image occurs, rather than hosts on which the image is anchored.

Elaborating a concept of the sound image based on the dynamic character of the image proposed by Simondon disengages it from the idea of the sound image as a visual representation prompted in the mind of the listener, as another term for a memory imprint, a duplicate or a surrogate. Simondon assumes that the sensorial is a problem-solving process integral to the vital unfolding of individuation, and not a product of the autonomous sensing capacity of an agent. In this context, an image implies a temporal stabilization intrinsic to such a process, rather than a stable attribute of an entity or an illusion.

As the Simondon scholar Andrea Bardin argues, for Simondon the image is, "in fact, the name of an operation."[2] The sound image I propose entails an operative stabilization of a sensorial engagement that gives form to the audible.

[2] Andrea Bardin, *Epistemology and Political Philosophy in Gilbert Simondon - Individuation, Technics, Social Systems* (Dordrecht: Springer, 2015), 147.

This operation, the configurations it takes part of, and the mental, technical and material components that articulate it, become the key to addressing the mutable condition of the audible.

When the blaring multi-chime horn of a heavy road-truck vehicle resounds in an urban quarter, different sound images can be constituted that are inherent to different forms of sensorial engagement. These images are not anecdotal or visual representations of an external phenomenon – the truck passing by and chiming its horn – they are the operation through which this sonorous circumstance becomes audible.

A sound image is constituted when this circumstance is heard as the excitation of resonances afforded by the physical characteristics of the urban environment. It is a rendering of the spatial qualities of an architectural context activated by the broad frequency range of the brief discharge of sound. This form of the audible assumes a sensorial engagement with the micro-temporal unfolding of direct and reflected wavefronts produced across the location, and informs an awareness of the spatial aspect of the sonorous. This specific stabilization of the perceptual *is* a sound image. As an operation, this image renders the form in which listening occurs.

The blast on the horn can also be heard as a chord. Such a stabilization of sound perception is structured around the engagement with the superimposed harmonic interferences rather than their dynamically decaying behavior. This sensorial operation constitutes a different sound image. No awareness of the spatial is rendered in this harmonic production of the audible. Each of these forms of the audible is independent from the other, and most commonly excludes the other one from taking place – even if an alternation between them

is fluid – in a circumstance comparable to the perceptual oscillation famously accounted for in the Jastrow rabbit-duck figure.[3]

Each of these sound images, corresponding to different sensorial operations, implies a configuration of engagement of sensing agent and milieu. The form in which the sonorous becomes audible cannot be exhausted by attributing it exclusively to the will of a listening subject. It is rather informed by the participation of the sonorous in configurations and operations which, in their turn, define the listening subject.

Throughout the thesis I adopt a distinction between the audible and the sonorous. I concur with sound scholar and composer François Bonnet as he claims that "the audible and the sonorous are not opposed to each other."[4] They are not fundamentally separate but two aspects of sound. Addressing the audible means addressing the way sound enters into relationships that inform how it comes to be heard, while the sonorous refers to sound in its material unfolding independent from the act of listening. The sound image is inherent to the production of the audible.

The notion of sound image is useful since common notions used to address singular instances of the audible, such as the colloquial *a sound*, are often insufficient to address the plural and mutable character of the audible. These common notions entail attention to different and specific aspects of the sonorous and tend to presume a straightforward or unproblematic reference. However, I argue that the production of a reference needs to be addressed as immanent to the constitution of an image.

[3] Ludwig Wittgenstein, *Philosophical Investigations* (Oxford: Blackwell Publishing, 1953), 194.

[4] François Bonnet, *The Order of Sounds – A Sonorous Archipelago* (Falmouth: Urbanomic, 2016), 8.

For Simondon the image not only transcends the visual: "each of the senses has its own image" [5] ; it also transcends the notion of the image as an autonomous entity. The image is for him an "intermediary reality [...] between self and world" that can take place in diverse forms and entail diverse technical configurations.[6]

The elaboration of a renewed concept of the image in Simondon's work, claims visual scholar Emmanuel Alloa, emerges as part of his responses to the problem of how "the relationship between individual and environment is articulated."[7] This unfolds in the context of his main philosophical project, that consists of a criticism of historical accounts of individuation (physical, biological, psychological, collective) structured around the search for a *principle of individuation.* Simondon develops an ontology that prioritizes processes of individuation over constituted individuals. He asserts that, rather than aiming to explain the constitution of the individual by searching for a principle of individuation, the assumption that "individuation has a principle" should be questioned.[8] In this context, sensing agent and milieu are not conceived as anteriorly formed and autonomous instances, but are rather co-constituted in a process of co-individuation, since "what individuation manifests is not merely the individual but the individual-milieu coupling."[9]

In his course *Imagination et Invention* the image is elaborated as a temporal circumstance that unfolds across what Simondon calls the *cycle of the image*. This cycle comprises the performance of anticipation, perception, recollection

[5] Gilbert Simondon, *Imagination et Invention* (Minneapolis: University of Minnesota Press, 2022), 15.

[6] Ibid., 13.

[7] Emmanuel Alloa, "Prégnances du devenir: Simondon et les images," *Critique* 816 (2015): 357.

[8] Gilbert Simondon, *Individuation in Light of Notions of Form and Information*, translated by Taylor Adkins (Minneapolis: University of Minnesota Press, 2020), 1.

[9] Ibid., 3.

and invention, instances across which the image exists as a node. The cycle is crucial to establishing the idea that the image cannot be conceived as the outcome of a direct impression. The image both *precedes* and *exceeds* perception, since it entails a temporal process of stabilization of which perception is only one stage – in which adjustments take place in the co-emergence of agent and environment. The image takes place across multiple temporal scales and collective instances and is not be exclusively limited to the realm of the conscious subject.

In this thesis I argue that a novel notion of *sound image*, founded on this re-consideration of the image in its nodal nature, is needed to account for the ways in which the audible is produced through the relational configurations that sound takes part in. Too often the relational quality of sound is presumed to depend on the autonomy of the subject, its stable identity, the attribution of an independent consciousness and *a voice*. The ontogenetic nature of the image addressed in this thesis, however, concerns the individual as a *transductive reality*. As Simondon explains this, "[b]y transductive reality, we mean that the individual is neither a substantial being like an element, nor a pure rapport, but the reality of a metastable relation."[10]

Too often, as well, this relationality is assumed on attributing the materiality of sound to the projection of stable objects, such as in the expression "the sound of stones," or when sound is claimed to exist separately from "the space where it occurs." In these cases, the material condition of sound is addressed as belonging to the projected objects rather than the dynamic character of acoustic propagation. Relations are then predicated upon these projections and the presumed stability of listening subjects, rather than the production of forms of engagement which make the audible possible and which inform how the sonorous participates in the metastable nature of sensorial configurations.

[10] Ibid., 262.

The variable nature of the sound image that I address is concerned with the engagement enabled by the circuits that sound takes part of. My purpose is to express the mutable nature of such circuits. I take the notion of circuit from sound researcher and artist Raviv Ganchrow. He elaborates this notion by claiming that "[h]earing is steeped in earth circuits". He argues that, in the wide-ranging context of the development of hearing in the history of the earth, "[t]he coevolution of hearing, sounding, and environment intertwine qualities of attention, environmental features, chemical and mineral structures, and electrical agency."[11]

I disregard the polar opposition between hearing and listening that stands at the root of many studies on sound and deliberately alternate between the two, while I adhere most often to the term *listening*. Rather than acknowledging a contrast they seemingly express between perceiving sound and focused attention to sound, I want to emphasize a range and variety of forms in which attention is performed. I argue that, across the range of possible forms of relationship to the sonorous, there is no such thing as a passive stance. Rather there are various performative instances of engagement that happen at diverse levels and scales which are responsible for producing the audible. The way this engagement takes place involves techniques and collective protocols as well as cosmological underpinnings. This is eloquently expressed by musicologist and sound scholar Ana Maria Ochoa Gautier, when she claims that "before the question of how do people perceive the environment in auditory terms comes the question of how the very boundaries between personhood and environment are conceived."[12]

[11] Raviv Ganchrow, "Earth-Bound Sound: Oscillations of Hearing, Ocean, and Air," in *Theory & Event* 24, no.1 (2021): 69.

[12] Ana Maria Ochoa Gautier, lecture given as part of "Sound Studies and Auditory Neuroscience: New Perspectives on Listening", May 1st, 2017 in Columbia University, accessed August 4, 2022, https://www.youtube.com/watch?v=S8hqNob6awA .

Overall, my quest for a reconceptualization of the sound image is aimed to unfold in two directions. On the one hand it aims to provide a tool to account for how the audible is produced as part of configurations that enable acts of engagement intrinsic to material, technical and collective conditions. On the other hand, it advocates for an incorporation of sound in the broad reconceptualization that the notion of image is subject to in the context of current technological and societal developments.

This reconceptualization unfolds along the two parallel series of chapters and the set of four sound works. In the first series I develop a framework for re-conceptualizing the sound image. I address how the notion proves useful in avoiding the pitfalls of habitual notions used to address singular instances of the audible, especially when considering its malleable nature. I explore the intricacy of the notion of sound image with forms in which audibilities are constituted, their technical condition and how they are inherent to protocols of collective usage. I also address how the sound image can be conceived as the axis of an artistic practice that critically and creatively engages with the production of the audible and speculate on how this might inform a reconceived notion of imagination.

Across and through the four works which constitute the experimental backbone of the dissertation, I problematize the way in which the audible is constituted. Each of the chapters in the second series of the thesis sets up a dialogue between the renewed concept of sound image and a notion or category from the domain of art practices. In this dialogue various affordances of the concept are explored to attest to the way these works act upon technical conditions, protocols and collective infrastructures that inform how the audible occurs.

My reconsideration of the concept of sound image is aligned with the current challenging of the image as an exclusively representational and static instance. The procedures that inform what an image is considered to be have been under scrutiny since the beginning of the twenty-first century.

It is nowadays common to use the term image for visual instances that have been produced by the systematic processing of data sourced in disparate kinds of sensorial inputs (e.g.: thermal, ultrasonic, vibratory) or by autonomous computational processes, rather than by classic processes of optical imprinting. Medical and scientific images, as well as images-generated by AI technology are some examples of such visual instances. They are produced by circuits of stabilization more intricate and diverse than those of older technologies of imprinting such as optical photographs or painting.

The stability of pictorial representation is nowadays most often supported by the dynamic character of computational streams, rather than the stability of dry ink. This is nonetheless just one simple aspect of the way visual instances inform a different articulation of instantaneity and simultaneity, and the challenge they pose to the entanglement of image, representation and the real.[13]

The proliferation of visual instances prompted by the "culture of screens, video surveillance and the simultaneity of images" has further led the image to lose its "essential *otherness.*"[14] If these visual instances are conceived as part of a

[13] Daniel Rubinstein and Andy Fisher, "Introduction: On the Verge of Photography," in *On the Verge of Photography - Imaging Beyond Representation,* eds. D. Rubinstein, J. Golding and A. Fisher (Birmingham: ARTicle Press, 2013), 9.

[14] Krešimir Purgar, "What is not an image (anymore)? Iconic Difference, Immersion and Iconic Simultaneity in the Age of Screens," *Phainomena* XXIV/92-93 (June 2015): 165.

primary mode of interaction with the real, the foundation of what is understood as an image is transformed. As visual scholar Krešimir Purgar elaborates: "The screens conveying events in real time are not pictures in the traditional sense anymore not because of sophisticated technological solutions that enable immersion into real events and active form of communication i.e., influence on real events, but because they for the first time make us lose the awareness of the medium as a conveyor of information."[15] Both the reliance on the image as a pictorial entity or as a mental content is challenged, and priority is given to the temporal stabilization that informs what an image is considered to be.

Visual scholars Ingrid Hoelzl and Rémi Marie have summarized how the concept of image has been "dissolving under the assault of neuroscientific modelling and advances in machine vision." [16] They allude to the contemporary image "as an operation and as a process rather than a representation". The association between image and operation has been ubiquitous since the beginning of the two-thousands, when the notion of *operative image* was initially championed by Czech-German filmmaker Harun Farocki. Nonetheless, there is a significant difference between Farocki's idea of an operative image and the operational in Hoelzl and Marie's perspective. The latter can be compared better to the operational condition in Simondon's work.

Farocki coined the term as he addressed the then novel technological practices in which visual images were not used to "represent an object, but rather [as] part of an operation."[17] This condition – first described by Farocki to address military technologies "where the image functions as a guiding tool for target tracking and the real-time adjustment of a missile's trajectory"–

[15] Ibid.

[16] Ingrid Hoelzl and Rémi Marie, "From Softimage to Postimage," *Leonardo* 50, no. 1 (2017): 72-73.

[17] Harun Farocki, "Phantom Images," *Public* 29 (2004): 17.

concerned the use of photographic artefacts as input for parametric analysis and computational calculations.[18] In Farocki's terms, the image had changed its function, as it was used no longer "to inform or to please."[19] The image, though, remains in this case conceived as a static visual imprint, to be posteriorly analyzed in order to perform an operation. In the case of both Simondon and Hoelzl–Marie's stance, though, the image *is* an operation.

Rather than considering the image as an independent optical entity that enables an operation to be performed, the image is an articulation of a number of agents that enable a sensorial engagement that belongs to a material–technical sensorial circuit to occur. Technical procedures are not subsidiary, but rather responsible for the configuration in which the image is defined and constituted.

Hoelzl and Marie refer to the relationships that images enable. These are "engaged in an operation of data gathering, processing, rendering and exchange."[20] The operation that produces this stabilization is not that *of an agent.* Their stance is compatible with Simondon's fundamental re-appraisal of the operational. In the case referred by Hoelzl and Marie, "human vision is only one among many possible sentient systems."[21] The image is therefore not anchored on the (older) technical scheme of the imprinted plaque, which gave it its intrinsic (and relative) static nature, but it is rather dynamic and proper to a metastable context of transformation. Images are produced across circuits articulated in a metastable process of interaction. As German artist Hito Steyerl expresses, "it has become clear that images are not objective or subjective

[18] Ibid.

[19] Ibid.

[20] Hoelzl and Marie, "From Softimage to Postimage": 73.

[21] Ibid.

renditions of preexisting conditions, or merely treacherous appearances. They are rather nodes of energy and matter that migrate across different supports."[22]

Images as processes of stabilization rely on technologies that enable the synchronization of multiple agents. Media philosopher Mark Hansen has claimed that "on Simondon's account, images, in their back-and-forth flow between the material world and the mental realm, do not so much support the experience of the subject as [they] open a coupling of organism and world that is fundamentally independent from the one performed by consciousness."[23] Rather than merely representational, images imply acts of synchronization across actors. Though, whereas this synchronization in the case of traditional pictorial representations relied on the stability and efficacity of printing methods, their proliferation and its associated protocols of sensing, this synchronization is nowadays performed as part of more intricate and developed actors in the computational realm.

This provokes a retrospective reconsideration of the role of the image in a wider historical spectrum. Writer and art curator Claudia Gianetti claims that in the current context, the notion of *technical image,* outlined by the innovative scholar Vilem Flusser, has become an everyday reality. She contrasts the realm of optical "images", seemingly referring to their traditional role as "mediators between human beings and the world" and as they "make the worlds accessible and imaginable", to that of *technical images*, which "interpose themselves between the world and human beings" so that human beings "'end up living

[22] Hito Steyerl, "Too Much World: Is the Internet Dead?," *e-flux Journal* 49 (2013), accessed August 14, 2022, https://www.e-flux.com/journal/49/60004/too-much-world-is-the-internet-dead/.

[23] Mark B.N. Hansen, "From Fixed to Fluid - Material-Mental Images Between Neural Synchronization and Computational Mediation," in *Releasing the Image - from literature to new media,* eds J. Khalip and R. Mitchell (Stanford University Press, 2011), 108.

according to their images.'"[24] Nonetheless, a re-assessment of the image as operation readdresses the operative condition of every instance of the image across history and across technical contexts. It can be argued that the form and the actors involved in the image-operation have changed and encompass now other circuits and procedures, while the nature of the image has not fundamentally changed. Addressed as operations, images always imply a modulation of an engagement with the real. They entail a form in which integration, synthesis and synchronization is performed.

The image is not the product of the subject as a listener or viewer, nor is it an independent artefact, it is an operation that affords a metastable relation to be constituted. It does not relocate the agent involved in its operation in *another world*, but rather deploys its temporal articulation with a milieu. For Simondon this articulation should be conceived as a process of co-individuation of individual and milieu. Individual and milieu are not to be understood as detached from each other but as co-evolving, in a reconsideration in which the individual is to be "grasped as a relative reality, a certain phase of being."[25]

The notion of sound image I propose accounts for how sound enters into processes of mediation, proliferation and synchronization that inform the way the audible occurs. Images in the sound domain concern the diverse forms in which a sensorial engagement is produced, integral to the metastable coupling of agent and environment. Simondon resorts frequently to the notion of metastable equilibrium, which he takes from the domain of thermodynamics. He claims that individuation was never "adequately thought and described because only a single form of equilibrium was known, namely stable

[24] Claudia Giannetti, "Post-representation: towards a theory of hyper-representation and underrepresentation: ecologies of the image and the media, "in *Image in the post-millennium: mediation, process and critical tension*, eds. M. J. Baltazar, T. Quadros, J. Staal and R. Amaral (Eindhoven: Onomatopee, 2021), 76.

[25] Simondon, *Individuation in Light of Notions of Form and Information*, 3

equilibrium. [...] The ancients only knew stability and instability, rest and movement, but they did not know metastability clearly and objectively."[26] He refers to an equilibrium which does not exhaust the possibilities of the system in which it occurs. Stabilization is then only temporary, and the equilibrium of the system can be altered by minimal changes in its parameters.

Media scholar Aud Sissel Hoel claims that Simondon's theory of the image is part of a more general theory of mediation since both the image and the technical are understood not as independent artifices but as "facilitating a 'real coupling' between living being and environment, allowing them to form a joint system."[27] The technical is not to be conceived as a prosthetic extension of the real, but as integral to an originary technicity that articulates the living and its milieu. Technicity is a term used by Simondon to allude to the function that the technical object acquires as part of a technical medium, to its mode of being. Technology is then to be conceived as "an inventive force that intervenes in the human–world system by reorganizing its energetic and material forces."[28]

Sound scholar Douglas Kahn has alluded to "the surprise" that inventor Thomas Edison had upon hearing for the first time a recording of his speech: "'I was never so taken aback in my life.' His voice had moved from his throat to his ears."[29] Kahn is pointing at the transformation in the circuit that technology had set up, as it shifted the material configurations through which the voice was rendered audible.

[26] Ibid., 5.

[27] Aud Sissel Aurora Hoel, "Images as Active Powers for Reality. A Simondonian Approach to Medical Imaging," in *Dynamis of the Image: Moving Images in a Global World*, eds. E. Alloa and Ch. Cappelletto (Boston: De Gruyter, 2020), 297.

[28] Ibid., 294.

[29] Douglas Kahn, "Audio Art in the Deaf Century," in *Sound by Artists*, eds. D Lander and M. Lexier (Toronto: Art Metropole, 1990), 302.

Up to that moment, the sound of the voice had been steadily ascribed to the agency of the subject. The new technical operation recalled by Kahn had redistributed the agents in the perceptual circuit, altering the operation that enables the stabilization of the perceptual to congeal a set of spatiotemporal characteristics – to produce a sound image. This transformation does not concern any question of fidelity to a source, but rather a change in the configurations that inform this stabilization. The new configuration sets out the sonorous circumstance uttered vocally as adjacent to other material realms belonging to the technical device. The sound image becomes then dislodged from the motoric implications of the vocal tract to be modulated by patterns that do not belong to the human body. A frequency slide might in this case not be the result of a muscle dilation but of the slowing down of a motor wheel. As this stabilizes a new pattern of technical operation, the coupled system of microphone–and–voice becomes the nucleus around which other perceptual nuances are organized. For example, certain transients would cease to convey an impression of distance to become characteristic of this technical *system*. As Simondon elaborates, perception is then informed by the temporal stabilization that is proper to the image operation. Perception needs "the help of the image," since the image is a more complex and intricately stabilized temporal process which renders a scheme around which perception can be formed.[30]

Artistic practices are able to address the contingent and technical nature of image operations. In the renowned work *TV Buddha* by the Korean artist Nam June Paik, the picture on the TV screen and the wooden Buddha are different images not only due to their different perceptual features, namely, that the image on the TV is smaller, non-colored, blurrier, two-dimensional, and that the wooden sculpture is a three-dimensional volume and its wooden texture is

[30] Simondon, *Imagination et Invention*, 79.

perceivable.[31] They are different images as they entail different forms in which they *take place* as images.[32]

The flatness of the picture on the TV-set is not less real than the wooden Buddha, but it implies a different instance of reality that implicates the functional circuit of television broadcasting. As part of a CCTV (Closed Circuit Television system), the spectator appears next to the replicate of the wooden Buddha when they get into the frame of the camera. Rather than distracting from the artistic work, this participation of the viewer becomes part of how the image is constituted. This circumstance sets up a form of engagement of the spectator that is infused by the familiarity of the medium. The performativity of the closed circuit (CCTV) that is characteristic of surveillance modulates the presence of the spectator as integral to the circumstance that surrounds them.

On the other hand, the wooden Buddha encompasses the tactile nature of its homogenous material. Its existence as image takes place through the lustrous quality of its occupation of space, its role as symbol brought forward by its incantatory presence. Its becoming-image cannot be detached from this tactile unfolding: it is given by the tension between the simultaneous possibility to infer the tactile quality of the sculpture and the impediment to touch it because of its sacred quality – partly religious, partly institutional. The two images entail diverse configurations of engagement.

[31] Nam Jun Paik, *TV Buddha*, closed-circuit video installation with wooden sculpture, monitor and video camera. Dimensions variable (1974), accessed on May 1, 2023, https://explore.namjunepaik.sg/artwork-archival-highlights/tv-buddha/.

[32] I refer here to an often-quoted statement: "Images are neither on the wall (or on the screen) nor in the head alone. They do not *exist* by themselves, but they *happen*; they *take place*." Hans Belting, "Image, Medium, Body: A New Approach to Iconology," in *Critical Inquiry* 31, No. 2 (2005): 302.

Artistic experimentation can problematize the performative nature of the image and address the technical conditions that articulate them, it begs the question: how does technology inform the ways sensing is organized?

The technical is not understood as only inherent to devices that *expand* image–making capabilities, but as inherent to the mutations that determine how an image takes place. In other words, technology does not only enable different images to take place, but also different forms in which the image-operation becomes possible, as well as different *modes* of image-being, either in the visual or the auditory domain. Simondon claims that the image has a "regulating role" in the performance of this metastability.[33] Artistic practice can consist then in the exploration of a radical imagination that does not exclusively expand the field of possibilities of a certain regime of imaging, but rather addresses the operations that render images possible.

Problematizing the Audible

As mentioned above, this dissertation is comprised by two series of chapters, four sound works and an online documentation of these works. The first series of chapters addresses the conceptual plane upon which an operational notion of sound image is developed. Chapter 1.1 explains how the perceptual distinction and integration of the sonorous that give form to the audible is intrinsic to different forms of sensorial engagement. Particular attention is given to the way the spatial and temporal aspects of the audible are contingent to this engagement. I tackle the limitations of conventional forms of

[33] Simondon, *Imagination et Invention*,17.

identifying singular audible instances in their capacity to express the variable nature of this integration. The possibility of a reconceptualized notion of sound image is firstly introduced, inspired by the concept of image in the work of French philosopher Gilbert Simondon.

Chapter 1.2 elaborates how the constitution of a sound image is necessarily entwined with the constitution of an audibility. The notion of audibility is developed in parallel to existing notions of visibility with the aim to elaborate upon forms in which hearing takes place. I explore the general concept of image genealogically, to reveal how it has always entailed an operation that belongs to a specific technical and collective context. Examples from Image Theory show that the image is a situated notion, intrinsic to historical configurations it takes part of. The image is thus dislodged from optical models, and exposed as the product of an operation that enables a sensorial instance to become stabilized. The nature of this operation makes a form of the sensible (visible or audible) possible. Simondon's cycle is disclosed as the temporal backbone of the processual image. He describes the image in dynamic terms, and grounds different instances of the image as related to four different functions which constitute the four stages of the cycle of the image.

Chapter 1.3 explores the role of technical regimes in the stabilization of the sensorial. The image is addressed as an operation permeated by the procedures and components of diverse technicities. In this context, I investigate how diverse musical practices structure different sensorial and technical protocols. I problematize music listening and, rather than conceiving it as an autonomous practice, I expose it as a collection of operations that articulate how listening is performed and how it involves categories of sensing external to the purely musical context. The image as a micro-temporal instance of synchronization, in its nodal quality, expresses how artistic practice articulates a possible coupling of agent and milieu.

In Chapter 1.4 I tackle the notion of imagination not as the detached performance of a subject in the form of a *creatio ex nihilo*, but as an evolving and collective domain in which image-operations modulate real engagement. Simondon founds creative imagination – the fourth stage of the cycle – on the possibility of a reorganization of the stabilization process that the image implies. This has consequences for the way artistic practice and technology are articulated. Here, the sound image concerns the production of the audible as a coming together of the technical and the collective. The sound image becomes a key to address how relational configurations are produced without being hinged on the presumed stability of culturally inherited notions of subject and world.

In the second series, I present each of the four works developed as part of this dissertation. The notion of sound image is elaborated as key to their artistic procedures and brought into a dialogue with other notions pertaining to the realm of artistic practice in the realm of sound. These four works challenge the stability of the audible by acting upon the technical conditions that stabilize the sensorial. Each work acts upon different technical operations that inform how listening is performed, and how the sound image unfolds. These operations encompass, among others, the role of patterns of acoustic interference and the material traces of loudspeaker technology in rendering an experience of the spatial; the role of embodied traces of sound production techniques as axes along which the sonorous is distinguished, integrated and perceived to produce different material impressions; and the role of the synchronization between the visual and the aural in informing the production of perceptual distinctions.

Hence, the works engage directly with the role of technicity in their transformation of the audible. In the context of Simondon, an image does not exist without the metastable coupling of agent and milieu. As the stabilization of this

sensorial engagement literally shapes *what* is heard, the role of technicity is inherent to the formation of the sound image.

Chapter 2.1 addresses how my sound installation *Focus* problematizes the way listening adjusts to the technical apparatus of sound reproduction. The sound image is conceived here as inherent to the spatial and material affordances of the circuit of sound reproduction. In this work I explore sound mediation as an infrastructural condition rather than as a prosthetic translation. *Focus* problematizes the capacity of audio recording and reproduction technologies to re-enact acoustic impressions. It addresses the forms in which the spatial aspect of sound is made audible, and how these are modulated by the material and technical characteristics of the devices of sound recording and reproduction.

Chapter 2.2 pits the notion of sound image against the notion of timbre as a way to explore how the perceptual stabilization of the sonorous is produced intrinsic to the configurations in which it takes place. My work *The Construction of an Imaginary Acoustic Space,* for ensemble, magnetic tape and digital soundtrack on three stereo loudspeaker systems, tackles the processes of distinction and integration of perceptual threads as they unfold in a complex of histories of sound mediation, musical instruments, concert hall acoustics, and the material-spatial implications of different technologies of sound production. In the chapter I explore a genealogy of the notion of timbre, and how its mode of conceiving perceptual distinctions is based on historical models of sound which imply in themselves a logic of music making and epistemic assumptions about how sound is to be appraised. The sound image becomes then a hinge for the metastable articulation of listening in its entanglement with the techniques used to produce sound.

Chapter 2.3 pits the notion of sound image against the notion of musical figure to challenge the way they imply different kinds of sensorial integration. The sound image is used to account for sonorous circumstances in which

multiple possible stabilizations of the perceptual can be prompted to unfold in parallel. My sound installation *Oscilación* deals with the tension between the codification of field recordings and sound sourced on musical instruments and the embodied experience of sound rendered possible by audio technology.

Chapter 2.4 tackles the audible as formed in the context of audiovisual staging practices. My work *Sound Theory (The Clouds)*, for violoncello, video, live-video, soundtrack and multi-channel loudspeaker setup modulates the perceptual engagement of the listener in the context of audiovisual infrastructures. The composition acts upon the way listening is informed by protocols of attention, synchronization and amplification that belong to the theatrical-cinematic setup and the history of practices of auditory staging.

Across this research listening is not summoned as a transparent entanglement of the sonorous and the listener, nor is it reduced to the generation of multiple references on the mind of the listener. Central to this thesis is the investigation of the malleable conditions of co-emergence of sound image and audibility. The sound image cannot assume the audible as an imprint of a sound object, nor can it conceive of referentiality as distinct from its own manner of occurring – it is produced by and inherent to the regime in which it unfolds.