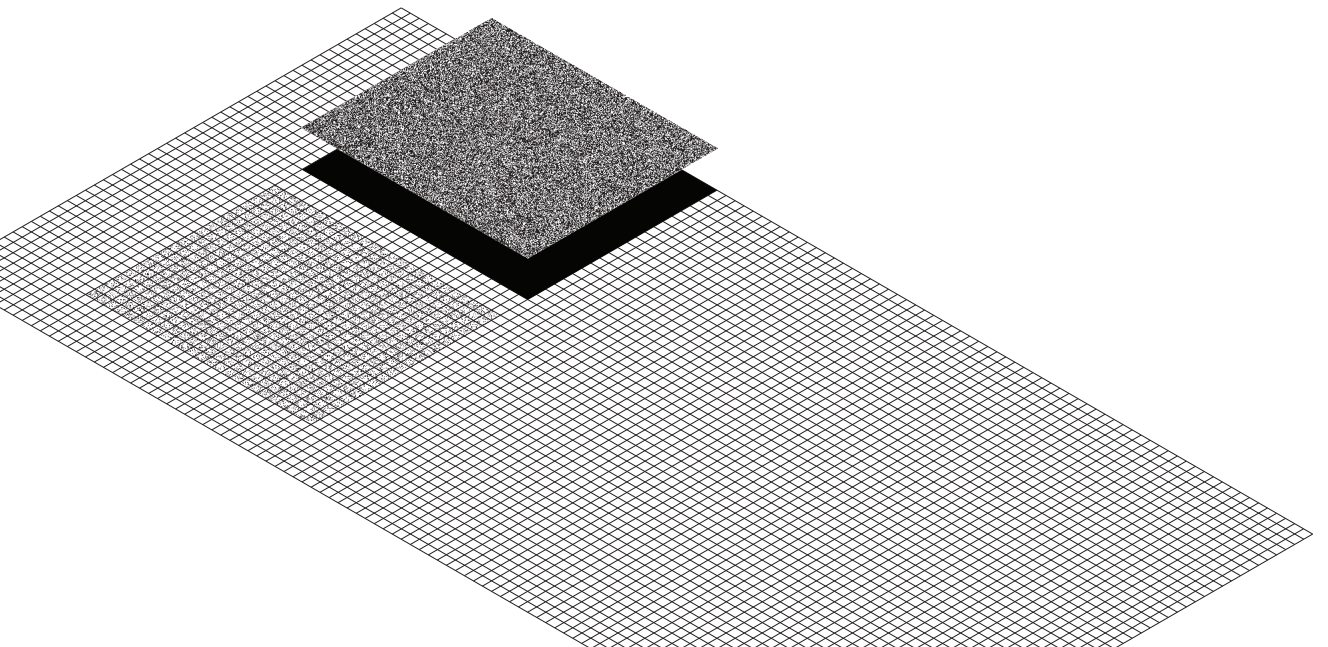
A Habitat of Recognition



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To my family and dearest friends on both sides of the Atlantic,
whose talks, smiles and shared hopes gave space for my becoming.

To Professors Andrea Sick, Dennis P. Paul and Ralf Baecker, whose actions made my work possible for the past three years, and whose work will continue to inspire me ever after.

To Mariana, whose love and companionship co-created all of it.

Abstract

This study documents a coupled artistic-based and theory-engaged research on the material dimensions of digital technologies, by tracing a new digital materialism that incorporates infrastructures as core intra-active agencies acting on the tension between distinction and convergence of matter. On the basis of the definition of materiality as entanglements conceived by Karen Barad in her Agential Realism theory, as well as an abstract and historical account on the distinction between the Analog and the Digital as argued by Alexander R. Galloway and Claus Pias, the research enacted a series of experiments that aimed to inquire the issues of digitality from an ontological point of view and to problematize the tropes of its dichotomous tension between matter and information.

In a second step, by intertwining the study of a geology of media from Jussi Parikka with the inquiries on the processes of stratification and segmentation by Gilles Deleuze and Felix Guattari, as well as the notions of habit and cognition brought by Gregory Bateson, the research accounts for the sites of mining and material harvesting that are part of the present-day digital technologies and exposes the mechanisms of segmentation of labor and landscapes that are entangled with the materiality of digital components, further tracing its entanglements with a habitual thinking that acts as a black-boxed infrastructural agency within an economy of thought. Lastly, the study probes recognition as the core habitual mechanism that segments matter into discrete entities via the stratification of the tension between reading and writing processes, and enacts an imaginary infrastructural habitat where both continuous landscapes of residue and discrete ores of sedimented value entangle through a present simultaneous record of their intra-action.

KEYWORDS

digital materialism, matter, habitual,
recognition, thought, paradox, infrastructure

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Foreword

We (the reader and the writer) will exchange places a few times during the following pages. For there is no reading that does not inscribe and produce more writing, and no writing that does not inscribe and produce more reading. And such paradoxical exchange is precisely the mechanism that generated this work. May such loop have occurred infinitely through words or by conducting material experiments, speculating on digital ontologies, gathering objects, or testing systems and electronic systems. It all combines inside one heterogeneous body of research: a research on new understandings of the digital and its materiality, or how the entanglements of algorithms, humans, infrastructures and Earth matter.

On the one hand, this work investigates and expands the digital.

From the flourishing of digital technologies mainly during the second half of the 20th century, to its ubiquitous burst powered by the networking technologies such as the world-wide-web during mainly the 1990s, we live currently in the afterglow of a so-called *"information revolution"* in which the aftermath of its accelerated growth is put into question. This study is born from this "*anthroposcenic*" aftermath, and it starts by troubling the very ontology of the digital and rewinding it back before its utopias took over in order to look for the missing links that currently affect our present the most, mainly: the link between the digital and matter.

When we talk about matter, we enact not only the raw materialities and the tangible infrastructural/hardware sides of the digital, but indeed a materialism similar to the historical one developed by Karl Marx during the late 19th century, but through a new, fresh, bursting new formulation that has been taking shape roughly during the past ten years inside media-theoretical discourses. This new formulation, or rather, the new materialisms of theorists such as Karen Barad, Rosi Braidotti, Manuel DeLanda, Reza Negarestani among others, share one common ground: the breaking of the human sovereignty among other planetary species and objects, as well as the breaking of a dichotomous, causal understanding of reality. These new understandings recognize that seemingly inanimate things or unperceivable abstract processes have agency. But even more importantly, they pursue the breaking of the dichotomous distinction between subject and object, viscerally entangling matter with meaning. Matter thus, through these new formulations, becomes live. And it seems that to be able to tackle problematics related to a digital that has become ubiquitous and environmentally devious; that has become evermore inscribed in the fabric of whole societies and its modes of living, and economies and its modes of production;

that has become a mechanism of power, control and surveillance of not only the State but also by a plurality of private power centers; and lastly, that has become evermore part of the human perception, knowledge and rational production; we need a new understanding of its material affects and its entanglements with the (already extensively mapped) symbolic/algorithmic ones.

On the other hand, this work investigates and expands artistic research.

By acknowledging the agencies of matter and our always inherently partial perception of it, the research compromised aesthetic experiments with different setups and materials that had the aim of furthering the research on a new digital materiality and its modes of appearance and agency. Once certain realities are made present (or rather, produced via material intra-actions) by means of the experimental situations, their presence altered and furthered the understanding of the subject matter in a co-constitutive manner. Matter and meaning intertwine. If, as Karen Barad states *"differences are made, not found"* (Barad, 2012a, p. 77), and matter is in constant becoming while even the instruments used for its measurement intra-actively constitute it, the vectors of research produced by this work were in fact making differences of the aesthetic type: a research on digital modes of affect and perception. While the philosophical nature of such inquiries within this research happens at a symbolic-theoretical level, it intra-acts with the tangible, material research of expression. The experiments, machineries and systems portrayed in the following pages do not thus represent a theoretical inquiry, nor exemplifies it or serves only as test-sites for its continuation; they are indeed non-textual, non-human entities that co-produced this work and the realities it entangles.

Thus the present work should not be taken as an academic treatise of a subject, but rather as a collection of essays that document a research process, an ongoing inquiry on a new digital materiality that takes the indeterminacy of the subject as its driving mechanism for both reading concepts and writing them along non-human entities. While a scientific inquiry may be concerned with determining and underlining an object or phenomenon, we, in our artistic inquiry, are concerned with the states of indeterminacy, of paradox and its moments and sites of openness and materialization. Although it may seem that recognizing an ontological indeterminacy feats the purpose of our ontological inquiry, our study rather admits it as *"integral, not supplementary, to what matter is"* (Barad, 2012b, p. 16).

Tracing a new Digital Materialism:

How intra-actions of distinction and convergence matter

> *"(...) the digital is something more fundamental. The digital is the basic distinction that makes it possible to make any distinction at all. The digital is the capacity to divide things and make distinctions between them. Thus not so much zero and one, but one and two."*
>
> GALLOWAY, 2014, P. 26

From the myriad of ways one could define the digital and the analog, the one proposed by the writer Alexander R. Galloway in 2014 is precise enough for our start. For Galloway, the digital is nothing but the *"one dividing in two"*, as well as the analog is nothing but the *"two coming together in one"* (Galloway, 2014, p. 26). The digital differentiates. It prescribes distinction and decision, as well as separates mass into distinct elements. Whereas the analog brings together, by establishing non-distinctive relations among heterogeneous elements into one mass. A convergence. Both instances engender an abstract notion of a mass, but if such notion is taken concretely, we are indeed talking about matter. If we ought, however, to trace what a contemporary account on what digital materialism is, we ought first to tackle the troubles of the uneven agency that has been given historically to the digital as opposed to the analog.

In an article published in 2005, the media-theorist and media-historian Claus Pias attempted to construct the idea of a *"cybernetic illusion"*, by taking the prevalent idea of cybernetics during the Macy-Conferences (1946-1953) as a *"new techno-philosophy subverting ontological borders"*, and analyzing specifically how the concepts of the analog and the digital were delineated during that time - a time of the birth of a *"new science"*, as well as the birth of the digital computer with the architecture it still holds up to this date. We begin by extracting a passage where Pias describes an idea of a 1943 prominent paper from Warren McCulloch and Walter Pitt, for it may illustrate well the bases for the first picture of the digital that is prevalent up to this day:

> *"(...) The principles of logic and Boolean algebra seem to exist somewhere outside our eternal world, but like Plato's immortal ideas they can be ›embodied‹ in the ›instruments of time‹ (Plato). So every thinkable thought can be implemented or embodied by a logical network. (...) It doesn't matter if information is stored in vacuum tubes or synapses or as ink on paper as long as the differences remain. The materiality of the medium simply doesn't matter for its functioning."*
>
> PIAS, 2005, P. 544

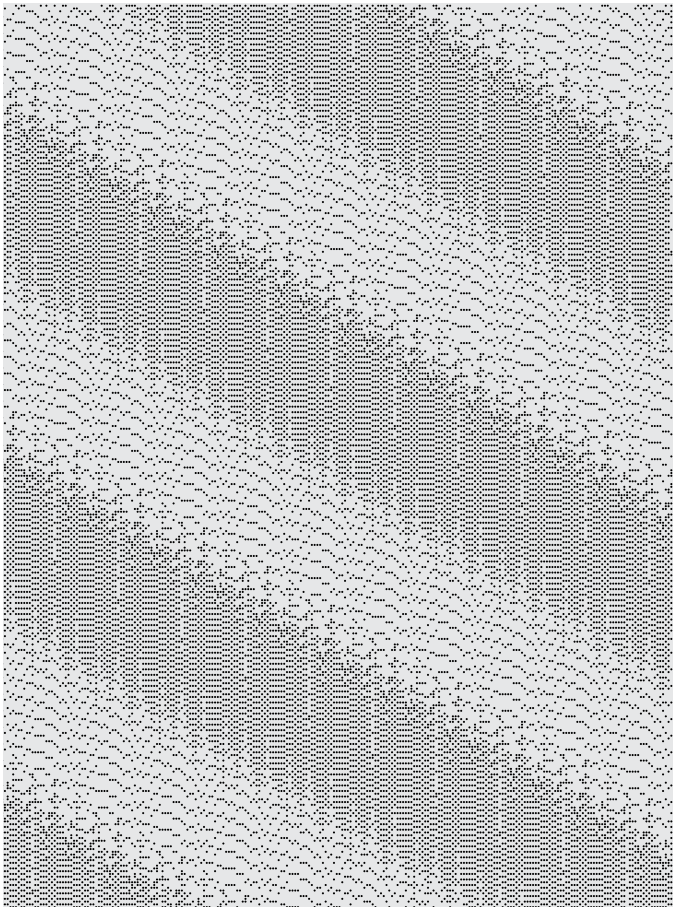

FIG. 1: PLOTTED LATCH

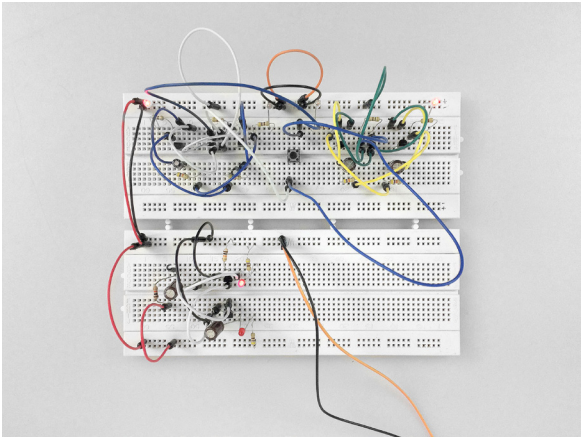

FIG. 2: LATCH PROTOTYPE

FIGURES 1, 2: ENACTMENT: LATCH

An enactment of a digital primitive device: a flip-flop (or latch). The circuit consists of two stable states and it can be used to store binary information. A series of tests were run at different speeds in order to turn perceivable its inconsistencies and metastable states that are produced in the system by its very physical/analog (in)capabilities. The well-functioning of this digital system was codependent to its speed of operation, a rhythm upon which its analog parts could perform as digital. Fig. 1 was plotted with the data "stored" by the device, whereas Fig. 2 portrays the prototype.

Information, thus, was constructed as a strictly abstract entity that was not bounded to any concrete material reality. The *"new science"* of cybernetics has begun to reshape and influence all the other sciences by measuring the world through the feedback loops of networks of information: all was understood as information-processing-machines, from computers to bacterias to our brains. The trope of informatics took over and flourished for decades up until the present day, where it is an almost too inseparable aspect of the world, its infrastructures (both global and local), and the many understandings of it. But let us once again step back to the discussion introduced by Pias, specifically when he cites an episode during the Macy Conferences where the north-American neurophysiologist and behavioral scientist Ralph Gerard said that *"synapses are not acting digitally"* (Pias, 2005, p. 547) and was promptly prohibited to speak by the (also north-American neurophysiologist and cybernetician) McCulloch right after. Such episode exemplified the blunt agenda of early cybernetics in introducing and sticking to the symbolic nature of the digital and at the same time shutting down the potentialities of the analog's continuous domain. Pias furthers to emphasize this distinction by three aspects of the discussions. First (through the Hungarian-north-american mathematician, physicist, and computer scientist John von Neumann), that the reason for not thinking about analog devices was an economical one, since the digital is more efficient. Second (through the north-American mathematician and philosopher Norbert Wiener), that *"our world is analog, but we introduce 'artificial' digital elements at specific levels to gain certain advantages"* (Pias, 2005, p. 549). And third (through the north-American psychologist John Stroud), that for building *"effective computers"* as well as a new *"experimental epistemology"* the continuous domain (and thus the analog) must be ignored. Furthermore:

> *"(...) it seems that the »experimental epistemology« of early cybernetics was built on specific ways of forgetting, neglecting, and ignorance – of forgetting the analog aspects (or ›nature‹) of its objects, of neglecting their materiality, and of ignorance about most of their states."*
>
> PIAS, 2005, P. 549

In order for the digital to flourish, the analog was left out - or rather, the analog was purified, chunked into solid-state small pieces capable of erasing (or silencing) out the *"devils"* that are *"generally working somewhere in between"* (Pias, 2005, p. 549) the continuous domains of matter. And that we may call the illusion of early cybernetics. The new science together with the new technologies being born and its subsequent impacts were ignoring (as John Stroud claimed for) the analog, and thus the raw, wild, untamed nature of matter and its agencies within the epistemological processes of

inquiry. Hence the material of such digital picture is entirely symbolic, abstract, and informational. It was born from a dichotomy of the immaterial (digital) and material (analog). And our world has thrived with code and software, thrived with the intangible and virtual systems, thrived with new forms of digital technical mediations, thrived with algorithmic systems of control, thrived with the pursuit of faster computing apparatuses, thrived with the trope of information production through networks of information - and this list could follow extensively. Instead of introducing *"digital elements at specific levels"*, the digital is now widespread and basis for the operation of contemporary neoliberal capitalism, its economics, modes of production, telecommunication systems and its various instruments of order.

But if we choose not to ignore the "*devils*" anymore, if we ought to find a digital materiality that does not rely on the illusion of a "*digital immaterialism*", we need to "*stay with the trouble*" (Haraway, 2016, 16-24) of our present times. What surrounds the digital at its concrete level? If we unpack the black box of a common digital computer in search for its ignored analog matters, a myriad of actors appear: not only an assemblage of minerals such as copper, gold, aluminum and lithium parsed and mounted inside components and upon printed circuit boards, but also the harvesting sites of these minerals, the logistics and montage infrastructures, the myriads of workers that assemble them together, the economic and social apparatuses of control in which the devices play a role in, the war zones where rare-earth minerals necessary for its functioning are coming from, as well as the complex biological and ecological impacts of the material production of digital components and their fast disposal. The one becoming two, ad infinitum, is a gigantic threaded mess. If in a such simple example a rather biased dystopian and slightly industrial picture is painted, it is inasmuch as that the illusion of a limpid, clear, immaterial cut of the digital has neglected its devils for too long. What it may seem here is that we are invoking a new view of digital materiality in regards to the Anthropocene (or rather the "*Chthulucene*", as the philosopher Donna Haraway have suggested), to our acknowledgment of an era where we as humans (and the machineries we create) are the crucial and dominant forces acting on Earth and its environment. But not only. What we truly invoke is for a materialism that is capable of confronting such issues by avoiding its imminent never-ending webs of causality and provoking the break of the illusion without backfiring into another dichotomy with an analog basis. If in our narrative we ought to stay with the trouble, we out to stay with the digital, and thus find a new digital materialism that is neither on the shining interfaces of our screens nor solely at the raw earth minerals they engender; one that is neither at the "*one becoming two*" nor at the "*two becoming one*" conundrums. Staying with the trouble in such sense thus means embracing the mess, and how the mess itself matters.

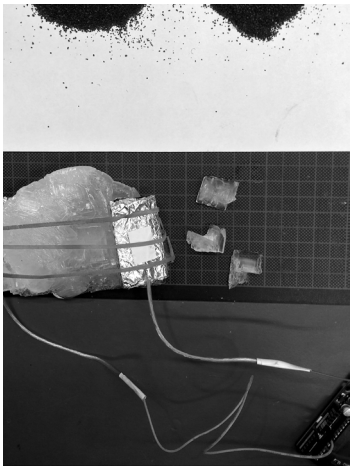

FIG 3: READING THE CRYSTAL

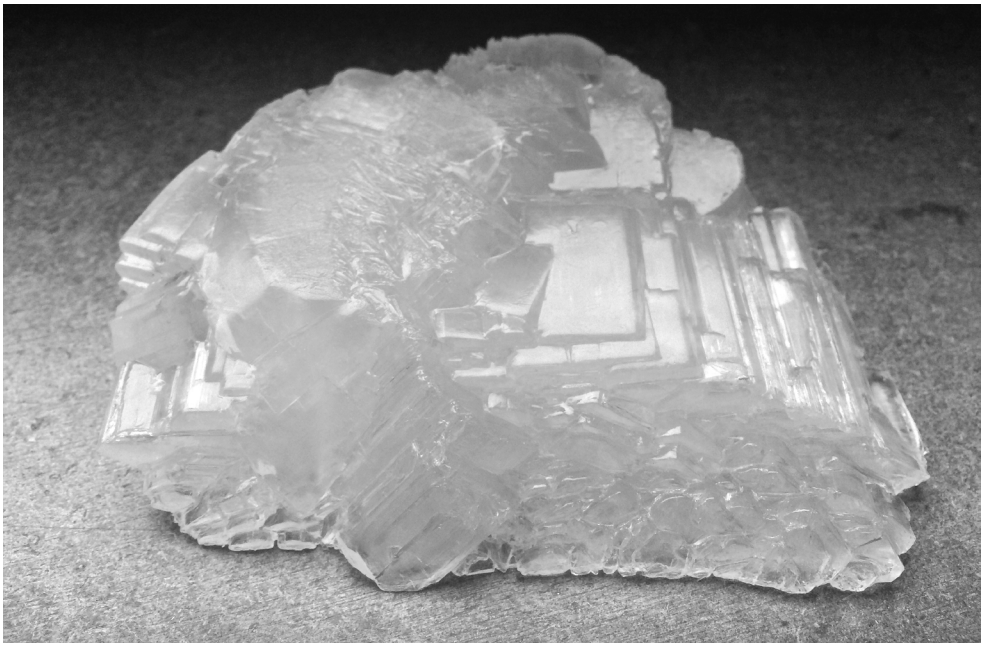

FIG. 4: DIY HOME BREW PIEZOELECTRIC CRYSTAL

FIGURES 3, 4: ENACTMENT: PIEZOELECTRIC CRYSTAL

An enactment of a Piezoelectric crystal - a crystal that has the ability to generate an electric charge in response to applied mechanical stress. This type of material is commonly found on many electronic devices (mainly transducers) however at very small, purified, discrete, distinctively cut pieces. Here, such matter was brewed to grow without these constraints. The resulting crystal, its size and formal patterns (technically called "habits") are tightly linked to its piezoelectric capabilities, and the types of raw current it is able to produce. By connecting the crystal to a sonifying machine, it was possible to "listen" to the direct influence of the "noise" of its matter, exhibiting an inherent analog modulation of an otherwise clear distinct digital signal.

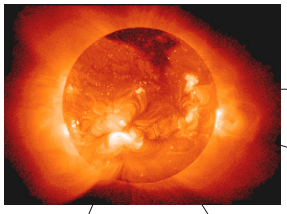

FIG. 5: Li PRODUCTION (STAR BURST)

FIG. 15: Li MEDICINE FOR
TREATING BIPOLAR DISORDE

FIG. 11: Li EXTRACTION/FILTERING

FIG. 10: EXPANDED PHONE Li BATTERY

FIG. 6: Li ▸ TRITIUM, FUSION REACTION

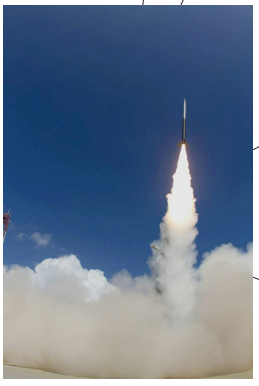

FIG. 12: TRAIL OF Li GAS

FIG. 8: Li (SALAR DE UYUNI)

FIG. 6: QUEBEC AGREEMENT
FOLLOWING THE Li ATOM SPLIT

FIG. 16: Li BATTERY POWERED CAR

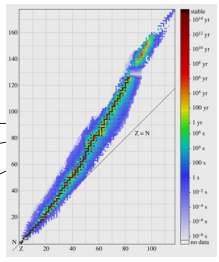

FIG. 9: ISOTOPES GRAPH

FIG. 13: BATTERY DUMP

FIG. 17: Li HARVESTING SITE (CHILE)

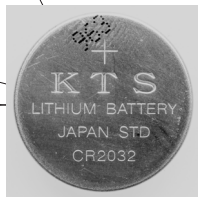

FIG. 14: Li BATTERY

FIG. 18: SOLAR POWER CELLS

FIGURES 5-18: TRACING: LITHIUM ENTANGLEMENTS

Tracing the unpacked "black-boxed" (Latour, 1999, p. 304) entanglements of the metal lithium. How does this network may produce the matter we call lithium? Taken as the holy-grail for contemporary technology, the map exhibits the complexity within elemental components of our current habitual technological life, and its counter-intuitive efficiency and illusory-driven processes that discard the analog agencies all along its network. On the one hand, lithium has a stabilizing property on humans suffering from bipolar disorder just as it stabilizes our habits with our mobile technology (being the main source of energy supply of our battery-run components); but on the other hand, lithium exhibits the opposite characteristics under extreme harsh scenarios: a volatile catalyst on both solar reactions and nuclear physics technology. The matter of lithium is higher than its atomic number property: the matter of lithium resides in its intra-actions in a never-ending thread. One of the key points of this research was the inherent capabilities of a material to act upon different scenarios at different time-scales, but it instead showcased how the matter lithium itself is produced through a myriad of intra-actions.

The feminist theorist Karen Barad offers a new theory that may assist us in such task. As part of her theory entitled Agential Realism - where she proposes that the universe is constituted of phenomena that are "*the ontological inseparability/entanglement of intra-acting agencies*" (Barad, 2007, p. 139) - she offers a concept that transcend the traditional notion of causal interaction: intra-action. In her own words, "*intra-action goes to the question of the making of differences, of 'individuals', rather than assuming their independence or prior existence.*" (Barad, 2012a, p. 34) To Barad, the notion of intra-action "*queers the familiar sense of causality*", insofar as "*'individuals' do not preexist as such but rather materialize in intra-action*". This notion directly addresses our notion of materiality as an ongoing process of intra-acting emergent "*parts*", where matter is "*substance in its iterative intra-active becoming—not a thing, but a doing, a congealing of agency*". Matter is "*morphologically active, responsive, generative, and articulate.*" Meaning, through the notion of intra-action, matter is not inanimate neither lacking agency. Matter is rather an intricate web of intra-acting phenomena. We may speak, for instance, of how lithium (Fig. 5-18) emerges from the intra-action of star bursts and salty deserts, as much as through neoliberal capitalism, laptop and mobile phone batteries, hard labor, global warming, 4G networks, electricity, Tesla, the politics of Bolivia and the Salar de Uyuni, bipolar disorder, pharmaceutical policies, programmed obsolescence, and the habits of social networking and mobility. The concept of intra-action breaks the notion of individualization that the concept of interaction still carries, and instead, opens up the Pandora box of complex intra-acting elements in constant change and in mutual production. It is a definite account of materiality as entanglements.

> *"The very nature of materiality is an entanglement. Matter itself is always already open to, or rather entangled with, the "Other." The intra-actively emergent "parts" of phenomena are co-constituted. Not only subjects but also objects are permeated through and through with their entangled kin; the other is not just in one's skin, but in one's bones, in one's belly, in one's heart, in one's nucleus, in one's past and future. This is as true for electrons as it is for brittle stars as it is for the differentially constituted human. (...) "*
> BARAD, 2007, P. 392-393

Finally, to have a new understanding of the digital that escapes the blind-sided view of the digital as mainly composed by virtuality, as well as the counter-sided view of its actual analog and tangible parts, we ought to speak about the intra-actions of its entanglements as its own matter. Such matter is both tangible and intangible. Such matter, to again reenact Galloway, indeed pertains an act of distinction (of sorting,

of filtering, of separating) traditionally recognized as the digital, but always in tension with an act of convergence (of gathering, synthesizing, combining) traditionally recognized as the analog. Intra-actions that emerge the discrete, and intra-actions that emerge the continuous, are both cuts that depend on the account that is made: if "*measured*" as discrete, digital, if "*measured*" as continuous, analog. This notion of materiality, as Barad writes, is already entangled with the "*other*", and inseparable from it. But if we only look through this particular abstract dichotomous cut, if we only take its micro-scale into account, how far could the "*other*" be perceived? How does such tension occur outside of the dichotomous cuts of black-boxes?

A new digital materialism emerges by not thinking of, but by engaging with the "*otherness*" of the intra-acting emerging parts that are involved with digital-analog tension mechanisms. It emerges by acting on the here and now, on "*getting our hands dirty with*" such matter and being open to its alienness. It emerges by acknowledging that there is just as much of the "*Other*" in one, as the one in the "*Other*" when they intra-act, in both present and future times. In our contemporary scenario when dealing with digital machineries for instance, it means engaging with the machinic aspects of us, just as much as the human aspects in them, or even more important, the traits of machineries in them that are alien to us. It means realizing that the ubiquitous computational devices of today are in constant intra-action with its infrastructures, as so the infrastructures themselves are under one's skin, just as much as under Earth's soil and bellow in the deep seas. It means engaging with the lives that work and produce digital devices and are on the here and now at one's smart-pockets, just as it means engaging with the close "*others*" that are made distant by our intra-action with our screens. It means engaging with the weirdness of the fluid algorithmic artifacts and alien software-realities that occur away from a human gaze. It means engaging with the panoptical strangeness and controlled apathy that emerges with social media as well as with the viscerality of the neoliberal digital economies and its surveillance apparatuses. It means engaging with all the sorts of new alien materials and artificial organisms that are produced both by digital systems and the piles of trash above the high seas and the holes on the ozone layers on Earth's stratosphere. In synthesis, a new digital materialism emerges from all the possible intra-active entanglements that put in tension the dichotomy of the analog and the digital, just as much as it puts in tension the dichotomies of time and space, of body and mind, of the tangible and the intangible, of the one and the other. Hence all intra-actions of distinction and convergence, both concretely and abstractly, matter.

Infrastructures of the Habitual:

Black-boxed landscapes and an economy of thought

> *"What if we mobilize such critique in relation to the geopolitics of hardware? What if our mobile-consumer selves have to be understood in connection with the heavier burden of hardware, labor, and work processes? For instance, the outsourcing of production is also an outsourcing of this hardware geology from the Western perspective to far-away places."*
>
> PARIKKA, 2015, P. 90

Looking at the sites of mineral harvesting and mining can be a very unsettling experience. Much like the uncanny valleys of computer-generated figures that almost share identical resemblance to a human being can evoke a sense of unease, such sites are not only uncanny but sublime: they portray a place paradoxically too alien and too familiar to our own perception, almost too unnatural to our own senses and too natural for our past inhabiting of the Earth, almost too complex for our eyes and too deep in time for our brains to handle. But yet, they grasp our senses in wonder and our instincts in apprehension. And even though they carry signs of digitality - patterns of distinction that could only have been inscribed by a human + machine entanglement - such sites are sites of encounter, sites where natural "*wilderness*" encounters human "*rationality*", sites where the digital becomes possible, sites where contemporary mediated capitalism sets its grounds, sites where hard labor becomes infrastructure, sites where human history encounters the deep-time history of the Earth. They are one of the crucial critical points of tension where the intra-active elements of the digital collide. Entangled to every bit of software, a bit of labor, a bit of Earth, a bit of muddy waste, black-boxed in the chains of its hardware.

On the one hand, these sites are deeply connected to the more tangible aspects of our contemporary consumer technology. Hardware entangles within its black box a myriad of metals, polymers and chemicals that are coming from, or produced at these places at ever uncanny paces. As the new media theorist Jussi Parikka states, "*the geological materials of metals and chemicals get deterritorialized from their strata and reterritorialized in machines that define our technical media culture*" (Parikka, 2015, p. 35). These are sites where geological materials get first deterritorialized, and under contemporary capitalism and its globalized modes of production (and chains of underpaid labor), such places become infrastructural agents that maintain not only global modes of production in action, but the quotidian ever-more digitally mediated modes of living.


Google Earth
Image © 2018 DigitalGlobe

FIG. 19 P. 24-25: SATELLITE PHOTOGRAPHY OF THE GRASBERG GOLD AND COPPER OPEN PIT MINE IN INDONESIA.

FIG. 20: SATELLITE PHOTOGRAPHY OF A LITHIUM HARVESTING SITE AT THE ATACAMA DESERT, CHILE.

FIGURES 19, 20: RESEARCH: MATERIAL HARVESTING

Satellite imagery of the Grasberg gold and copper open pit mine in Indonesia and a lithium harvesting site at the Atacama desert in Chile. The selected images exhibit a clear distinction between the smoothness of the "natural" habitat and the striated, distinctive, tamed, segmented occupation of the space by the harvesting infrastructures.

From an Earth-view perspective, however, these places are uncanny points of accelerated erosion, sedimentation and transformation with both local and global deep-time impacts - harder, even, on the outsourced localities and not so much on the (too often western and northern) outsourcers. Thus they are clashing points of not only different materialities but also different temporalities, all of which gets polished and enclosed inside black boxes for consumption.

On the other hand, such places themselves are not only sites of harvesting and mining, but landscapes of our own matter of distinction through recognition and thinking. It is that basic acquired habit of humans in perceiving things as discrete pieces, recognizing them as objects, and taking them from their habitat for further both abstract and concrete use that may be at the core of these sites. They are reduct of this process ad infinitum, extensively going deeper into Earth's core, or sprawling over its vast deserts. These landscapes are not only sources but also remains of this process. They are the very picture of a digital materialism taking action, for they exhibit the tensions of the digital distinction with the inescapable rawness of the earthly habitats they exist on. They are eroded images whose materials will be sedimented, filtered and turned into "*pure*", clean, discrete pieces and sheets; and whose "*purity*" will be discarded, reinserted and become part of other far-away places at not-so-distant futures. All done by a myriad of hard-working bodies and processes that are hardly ever made visible. It is once again, however, on the outsourcing of labor - a labor of harvesting and mining but also a labor of distinction and segmentation - that the black boxing of these landscapes lies on. If for our thinking, distinctively thinking has become an inescapable matter of conscious activity, the neglecting of these places made far-away with all their complexities and black-boxed hard labor they engender are rather a matter of unconscious activity. And if such cognitive black-box is passable of thorough inspection through conscious thinking, we are dealing rather with a sort of acquired and non-human iterative form of habitual thinking.

> *"The unconscious contains not only the painful matters which consciousness prefers to not inspect, but also many matters which are so familiar that we do not need to inspect them. Habit, therefore, is a major economy of conscious thought."*
>
> BATESON, 2000, P. 141

Thus if we continue on what might be called a speculative exercise of "*pychogeophysics*" (Parikka, 2015, p.59), infrastructures are not only the materialization of habits - since the routine and repetition of needs get materialized in tangible structures and labor chains - but they are also the ones supporting habits and reproducing them further.

FIG. 21: EARTH BATTERY EXPERIMENT

FIGURE 21: ENACTMENT: EARTH BATTERY

An enactment of a small-scale Earth battery. An Earth battery consists of a pair of different metal electrodes that are buried within the soil using water as an electrolytic solution. Large-scale earth batteries are potentially able of tapping telluric currents, but the small-scale experiment could only provide a very small current (however up to a voltage of 0.1V) coming from the very mixture of elements in the soil and water. The experiment was conducted to (in an almost alchemical manner) extract a signal from an ore of pure raw earthly dirt. The output signal showcased the chaotic unstable oscillations of the complex mixture of matters within the ore, as opposed to the filtered, stable, and "clean" type of energy that is expected from consumer technology batteries.

For the matters of such places are both too "*painful*" and too "*familiar*" (Bateson, 2000, p. 141) for conscious thought to inspect them, what we have instead are logical structures that automate thought - a habitual automation that runs not through neurons but through the non-human flows of energy, material, and labor within infrastructures. Would an inspection on such black-boxed infrastructures reveal not only glimpses of their inner-workings but also matters of thought upon which we have ceased to consciously address? Case in point, if we inspect the infrastructures of mining and harvesting that support the production of hardware as mentioned above, we find habitual loops materialized both on the hard repetitive labor of mining and extracting, but also on the machineries breaking, sorting and filtering matter present at such sites, on the continuous supplying and transport of the extracted materials to other far-away places, as well as the repetitive chains of production upon which each site is connected in the other end. All automatic, all black-boxed, all working as intricate pieces of machineries on a tight clock. The habitual is therefore the underlying mechanism of capitalism itself, which abuses of it as a black-box apparatus for the support of its own structures. We deal indeed, with a "*major economy of conscious thought*" (Bateson, 2000, p. 141). Capitalism relies on such mechanism, it relies on the lack of thinking and the sustaining of the habitual in all of its levels, for the troubled concrete encounter with these habitats, its harshness and muddy matters as well as the bodies working within them could possibly generate concrete thinking once again and the departure or ceasing of its chains. The loops of repetition materialized through infrastructures may thus be of the cognitive type, and in neoliberal capitalism the habitats they engender suffer geographic displacement by means of the black-boxing effects of the habitual. Thus the human and non-human elements entangled in the production of hardware, from its very beginning in these habitats, turn disguised inside black-boxes after black-boxes, until they fold (among a myriad of other apparatuses) into limpid, crispy surfaces of our contemporary devices and eager, pointing fingers taping at their surfaces on a habitual routine.

This line of events happens, however, in different planes and in a strict, segmented manner. From the very segmentation of the smooth and raw space of the land where the harvesting and mining complexes first takes place, to the segmentation of minerals, to the segmentation of work forces into labor castes, to the segmentation of each filtering and production cycle, to the segmentation between "*hardware*" and "*software*" of engineering companies, to at last, the segmentation between the individual who interacts with technological components and the individuals and habitats where they are coming from. Black-boxes require segmentation, insofar they are separate, discrete pieces that render all of its inner-workings invisible. While we are, as Deleuze and Guattari pointed, "*segmentary animals*" (Deleuze,

Guattari, 1987, p 208), segmentarity occurs as a mechanism of power. But other than following an inquiry on segmentation itself, let us attain to how the segmentation of each part of a material's life in the above thread engenders a black-boxing effect. Segmentation as a black-boxing phenomenon happens insofar there is a certain power that turns invisible (by displacement) and encapsulated (by disguising) each part separately for the better maintaining of the system itself. This power happens, however, not necessarily by means of a regulatory agency, but rather, it is inherent to the segmentary act, and thus becomes embodied in the very objects in question. For instance, the mining of mineral ores from Congo and its segmentation into "*filtered*" copper pieces within a printed circuit board, turns the whole social, natural, historical and political complexities entangled at the extracting of such ores into black-boxed segmented pieces of metal. While one single piece of purified copper is incapable of black-boxing the whole habitat it engenders, it is a vector, one iteration on a loop of a habitual mechanism that after iterative repetition becomes effectively concrete and tangible. As mentioned earlier, the globalized form of capitalism needs these mechanisms of power for its maintenance. But not only: for on the one hand, segmentation acts on black-boxing by means of power and non-visibility; but on the other hand, segmentation and segmented black-boxes are part of a habitual thinking that acts on the layers of perception.

The graph (Fig. 22) delineates how, in the words of the philosophers, "*the segmented line (macro politics) is immersed in and prolonged by quantum flows (micro politics) that continually reshuffle and stir up its segments*" (Deleuze, Guattari, 1987, p. 218). For them, the difference between the segmented line and a "*quantum flow*" is that the later "*implies something tending to elude or escape the codes*", having "*signs or degrees of deterritorialization in the decoded flow*". Whereas the segmented, rigid line, implies "*an overcoding that substitutes itself for the faltering codes*" and its segments are "*like reterritorializations on the overcoding or overcoded line*" (Deleuze, Guattari, 1987, p. 219). The graph and the differentiation between the quanta and the segment and their repeated iteration could be taken to different plateaus for the furthering of our discourse. On the level of infrastructures and the habitats of harvesting, the bodies and machineries performing the selection, gathering and filtering of matter embodies the rigid, overcoding power centers that segments lines; whereas the habitat, its matters and landscapes turn into quanta, or the ones who have degrees of inherent deterritorialization, but get overcoded instead. On the level of consumption and cognition, it is both softwares and its infrastructures as well as hardware and its infrastructures the ones who overcode, stratify, and segment bodies; however

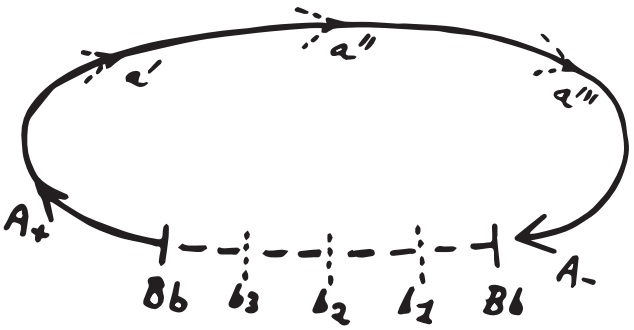

FIGURE 22: DELEUZE, GUATTARI, 1987, P. 218

Cycle/period of Micro politics x Macro politics:

A: flow and poles
a: quanta
b: line and segments
B: power center

bodies themselves are quanta that could yet elude or escape the codes, but are trapped by the habitual power of infrastructural segmentation that turns them into discrete quantifiable pieces. Quanta in this sense engenders thinking, an escape of the imprisonment of habitual, segmented, discrete lines. We could thus understand the portrayed loop as the basic iteration of the habitual in our discourse. In both abstract and concrete manners, matter is segmented and turned discrete in a habitual loop, but it contains and carries the potential for its escape. For even in a full state of sorted matter, or in a full state of unsorted matter, the in-between, ambiguous, unclassifiable, unrecognizable states evades encoding.

FIG. 23: EXPERIMENT WITH A MAGNET ATTACHED TO MOTOR AND PLATE WITH IRON POWDER

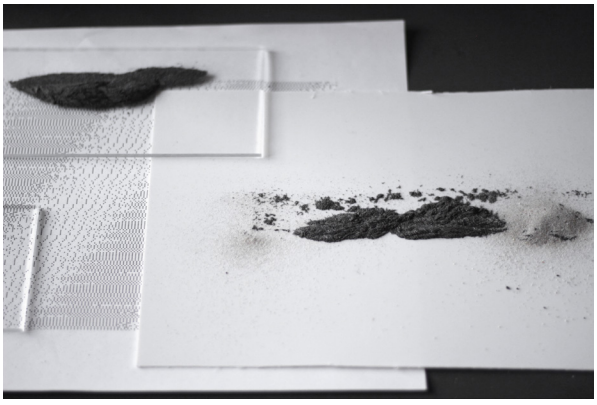

FIG. 24: SORTED MATTERS OF THE ABOVE PROCESS (SILICA SAND AND IRON POWDER)

FIGURES 23-25: REENACTING SORTING MECHANISMS

As a research for reenacting habitual sorting mechanisms present in material harvesting infrastructures, the images portray two experiments with the sorting and unsorting of two different types of dust (powdered) materials, one magnetic (iron powder) and another non-magnetic (silica) with the means of an e-waste magnet. The experiments exhibited not only the potentialities of the setup into coding and decoding matter, but also the thresholds between sorted and unsorted particles and their in-between states, ultimately sharing a cognitive resemblance to a landscape or territorial formation both in its physical aspects (different compounds of dust materials sedimented together) and its plastic ones (abstract formations taking a consistent shape).

FIG. 25: IN-BETWEEN SORTING MATTERS OF THE MENTIONED PROCESS (FIG. 24) (SILICA SAND AND IRON POWDER)

> *"Forms imply a code, modes of coding and decoding. Substances as formed matters refer to territorialities and degrees of territorialization and deterritorialization. But each articulation has a code and a territoriality; therefore each possesses both form and substance."*
> DELEUZE, GUATTARI, 1987, P. 41

Lastly, the notion of "*code*" in relation to segmentation takes both an abstract and a concrete meaning to our discussion. Code is a mechanism of power and distinction: it segments a particular quanta iteratively, so as it to be enclosed (or territorialized) into a symbol. Coding is thus turning unrecognized and disordered matter into a discrete object of representation and meaning to execute an order. To bring it closer to our concrete reality, code is inscribed within hardware not only through software, but on the very segmented matter that it is consisted of, for the matter it encloses was already part of a process of distinction and segmentation at a far-away habitat of production. The labor of material harvesting, parsing, sorting, filtering, and purifying is a process of encoding matter, of turning matter into objects of representation, and thus carriers of a certain habit of perception. Coding in this sense can be seen as the inscribing process of the habitual, and infrastructures the agencies of power that encode not only matter but bodies for economizing thought in a capitalist mode of production.

Paradoxically, infrastructures themselves are also the embodiments of the habitual. While the iterative nature of the habitual and the segmented line may engender a sense of processual causality, it is only so inside specific cuts within the big chaotic picture, for the materiality in which we deal with is of a different nature. All parts are intra-actively entangled and thus simultaneously instantiated, as we have discussed in previously. Infrastructures are only maintained if there are myriads of bodies and objects encoding and being encoded by them, if there are habits that both support and constitute them. The performing of a technological habit of social networking, for instance, is simultaneously linked to the embodiment of such habit back inside its hardware, back inside its infrastructures, back inside the far-away habitats and the first codding of matter. And in each and every stage, distinction plays its role by segmenting Earth into landscapes of production, and thus engendering the habitual perception of it as order. Everything is thus, repeated and intra-actively maintained at ever increasing speeds by myriads of entities performing segmentation.

On Reading and Writing, on Record and Paradox:

An imaginary habitat of recognition

> *"Everywhere we are creatures of habit that recognize beings and therefore do not encounter difference. We subordinate the beings of our experience to the same, similar, and the identical, assimilate what we experience to what we have experienced. 'Wesen ist gewesen'."*
>
> BRYANT, 2017

Re-cognition, cognizing again, a repetition of similarity, an involuntary habitual iterative process that occurs within perception. The inescapable habit of human beings, that wit of our thinking that encloses what is sensed into past recognized distinct things. Recognition as a process of segmenting things, an act of distinction and thus, of digitality; an abstract act that segments rather unrecognizable, concrete matters into discrete entities. Recognizing is separating, but it operates only via similarity and memory, even if what is recognized is composed of relative difference. Recognition is in such sense the trap of otherness, a trap of new possibilities of encountering the different, a trap even for concrete thinking. Recognition always happens at a site of encounter with otherness, but it does not engage with it, it rather segments it. Recognition is the micro process of a rather macro futile yet hardly escapable human attempt at understanding the world. An act of black-boxing, for the more we succeed in recognizing the world, the more opaque and obscure, the more crystallized, the more stratified, the more segmented it becomes. For "*when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity*" (Latour, 1999, p. 304), and is only when such machine stops running efficiently, when the black-boxes of habitual recognition brake, that thought escapes and happens. As opposed to the habitual, thought is an essential encounter with the unrecognizable, an encounter with "*something in the world that forces us to think*" (Bryant, 2017). Thought in such sense is "*essentially rare*" (Bryant, 2017), for it requires an encounter with otherness that somehow forces a ceasing of a habitual recognition. But how and when do these moments of encounter are rendered possible in contemporaneity, when the intra-actions with habitual mechanisms automate our perception at evermore uncanny paces, that evermore automate the recognition of the world, that evermore turns such automation into basic infrastructures for living?

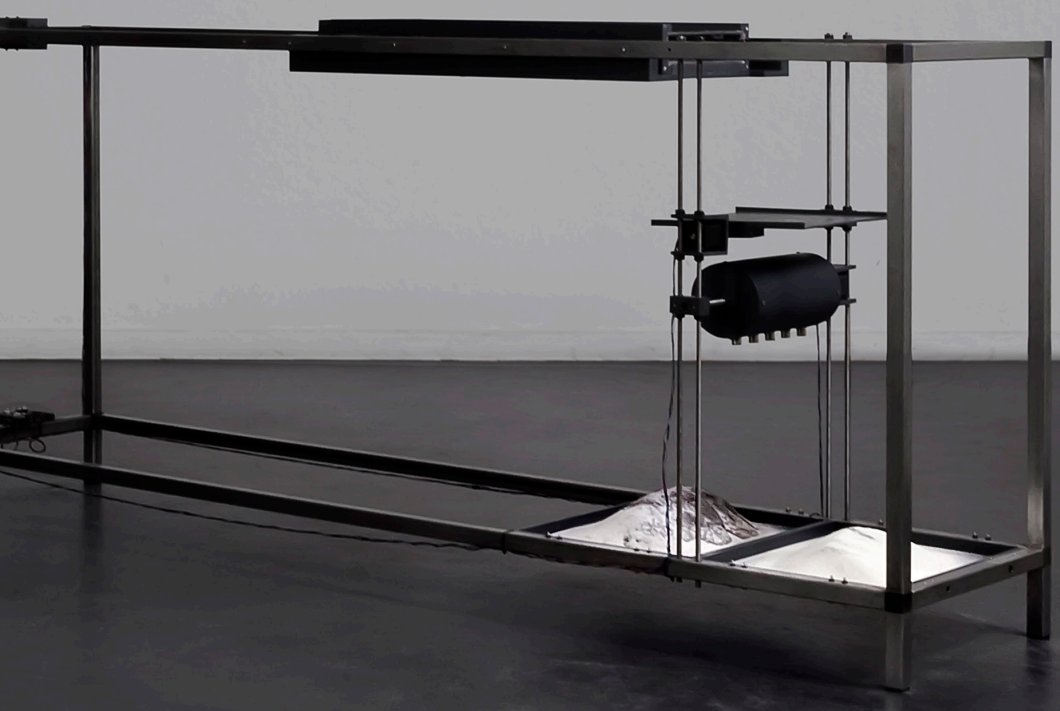

FIGURE 26 P. 38-39: INSTALLATION OVERVIEW

A Habitat of Recognition enacts an infrastructural imaginary where a coupled machine performs an automated reading and writing of granular records. An ore of two different types of sand particles (silica and iron) is sorted and measured layer by layer generating two residue composites, whilst at the same time previous residue composites are written on an empty ore reproducing the simultaneously read values. The recognition of the ore as a record requires its dismantling, and its new writing is prone to both the resilience of its residues and its measured discrete values. The repetition of this process depends upon the manual labor of exchanging what was read as an ore with what is written as one, and what was written as an ore with what is read as one. The imaginary stages the paradoxes of a habitual intra-action of distinction and conjunction of matter, while exposing its infrastructural agencies of both landscapes and habitual thinking.

Digital machines repeat in their own cores an act of recognition: the Turing machines that operate on a tape to read and write binary states in order to compute. While the machines processes do not recognize neither habituate in themselves, they embody our own manner of distinctively thinking, our own habitual binary distinction as a form of discrete thinking in the reading and writing of symbols in their most fundamental basis. And our digital machines automate this process, they automate habitually thinking not only in their cores, but on the agencies they engender with the others (humans, Earth, so long), for they produce segmentarity by means of the discrete and calculable. However, just as the machines we create both embody and encode our own habitual thinking; infrastructures are the black-boxed mechanisms that both embody and sustain nothing but it too. And as such, the act of recognition is first embodied by infrastructures specifically on the points of encounter, on the points where it tames the unrecognized matters into discrete, separate recognizable pieces. Inside a digital machine, recognition first happens at the encounter of the reading and writing mechanisms with the "*tape*": a record of previous encounters, an abstract matter of computation. Infrastructures on the other hand, embody recognition first on the habitats of encounter with concrete matter itself: the unrecognized matters of the Earth. But when an ore of the Earth is extracted, it already suffers a first segmentation: its recognition as an ore, which proceeds by stacks of selecting and filtering processes until the extraction of purity and its parsing into functional pieces of machineries is settled. Both the Turing machine and the infrastructures of its implementations thus perform acts of reading and writing, but at different

speeds and consequences. The reading and the writing of a Turing's tape engenders a reading and a writing of the Earth. Turing's tape, as an abstract entity, retains its constitution unaltered except for the new data that is encoded by it (a trope inherited by the segmentation of information and matter). But the raw earthly matters are read and recognized as commodities, as functional distinct pieces, engendering at least a coupled writing on both sides of such process: Earth on the one hand, and the extracted matter on the other. Thus the reading of Earth as an ore (imbued of abstract value) is simultaneously coupled with the writing of its landscape. The same, however, cannot be said about abstract reading and writing of information, but about the means by which abstract information is stored on matter, or in other words, the means by which a record is build via the reading and writing of matter. In both cases, the extraction of value (or the particular reading process that extracts abstract symbols from concrete matter) suffers a process of translation: a tension, transfer, and movement between at least two entities.

> *"The extraction of value from any material, place, thing, or person, involves a process of refinement. During this process, the object in question will undergo a change in state, separating into at least two substances: an extract and a residue. With respect to residue: it may be said it is that which never finds its way into the manifest narrative of how something (an object, a person, a state, or a state of being) is produced, or comes into existence. It is the accumulation of all that is left behind, when value is extracted... (...)"*
>
> RAQS, AS CITED IN PARIKKA, 2015, P. 101-102

The entanglement of reading and writing, and the paradox their simultaneous behavior enacts happens exactly at the moment of translation (in the sense of the term proposed by Latour, 1999, p. 311). But such moment in the complexity of digital infrastructures occurs nothing but through a process of distinction and separation. As Raqs precisely pointed out, the extraction of value happens through the separation of matter into two. One being the extract (the discrete, filtered, distinctive piece); the other being the residue (the continuous, unfiltered, devalued rest). Indeed a moment of tension between distinction and convergence, indeed a problem of digital materialism. Recognition thus entangles a process of reading and writing of distinct values, and as such, it inscribes a process of filtering, or separating, or gathering of the discrete that invariably produces an unrecognized devalued residue. The residue, by means of the black-boxing effect of infrastructures and the habits of recognition, never indeed finds its way to tell the story about "*how something (...) comes into existence*". But the invariable production of a residue (that if we abstract the term to also incorporate

any energetic transfer and dissipation that is part of a thermodynamic reaction) is the key for comprehending the paradox upon which recognition exist upon. A process of reading Earth as an ore already writes the Earth as a residue, as well as the process of extracting the ore from the Earth is a process of writing its landscape but also of reading its residues. The paradox is further accentuated when taking into account the parallel process of recognition in its various levels. The reading of a text message on a smartphone enacts not only the writing of it on the refined matter of its electronic components, but also habitually engenders the further reading of ores and the writing of the Earth as a residue. Once again, a process of intra-action of instances that happen on different levels and temporalities. Refinement happens ad infinitum through recognition, a step towards order, and the paradox lies also on the mess that this process produce through its abstract and concrete residues.

But the residue is more than what is left and untold, for it remains as a record of the very process that have produced itself. The extraction, filtering, and digital separation of refinement processes happen at certain discrete intervals, at certain speeds. And the speed of such processes deposit, sediment, and stratify the very residues into a record of its material intra-actions and all the actors involved on it: the recognition of value, the machineries of refinement, the infrastructures, the works and labor chains, the production companies, the consumer, etc. For it is the intra-action of this complex litany of actors that habitually determines the speeds of extraction and refinement, and thus, the patterns of the Earth as a record: all encrypted, stratified on its landscapes. But all the more paradoxically, the reading of the record produces nothing but more of itself. What is read, becomes continuous residue and discrete value, but what is written becomes continuous value and discrete residue. Such process however never happens without a loss of translation, error of refinement and recognition of value, for a percentage of otherness (that of which was being tamed, Earth) remains in the residue. Recognition as a segmentation process always cuts differences and flattens them inside discrete categories, but the residue is nothing but the persistence of differences, that of which is unrecognizable, that of which holds the potential escape of the segments. Thought, thus, persists through the unwanted residues of recognition. While the record and its patterns of similarity through time may be read as a record of its own previous intra-actions by means of its stratified speeds and quantities, the reading of a record as an ongoing process prone to failure, interruption, and occasional nuances induced by the very residues of its process and unrefined material agencies in its system, is indeed a manifestation of difference and thought, an escape from the habitual chains of recognition that happens only in the present tense and through simultaneous, paradoxical, intra-active reading and writing processes.

FIG. 27: MACHINE THAT READS THE ORE AND WRITES ITS RECORD AND RESIDUES

FIGURES 27-32: READING OF THE ORE, WRITING OF THE RECORD

The reading of the ore and writing of the record is performed by extracting from the ore layer by layer abstract discrete values by means of weight sensors. It incorporates a radial mechanism with magnets for filtering matter into binaries. An ore is manually put on top of the machine, and opened. The machine then pushes it by one side causing the mixed particles to fall slowly to the other. As soon as the particles fall, a sorting plate and a magnet interface begins its sorting. On the one side, predominantly non-magnetic particles (silica) gets sedimented; on the other, mainly magnetic particles (iron powder) remains and eventually is sedimented on another composite. The sorting mechanism resembles the processes that occur on the sorting of vast landscapes into mineral ores for further production. On the one hand, the reading mechanism sediments into two composite residues acting as records of their intra-action; on the other hand, it produces a discrete record of the read ore as well as the means for its new writing.

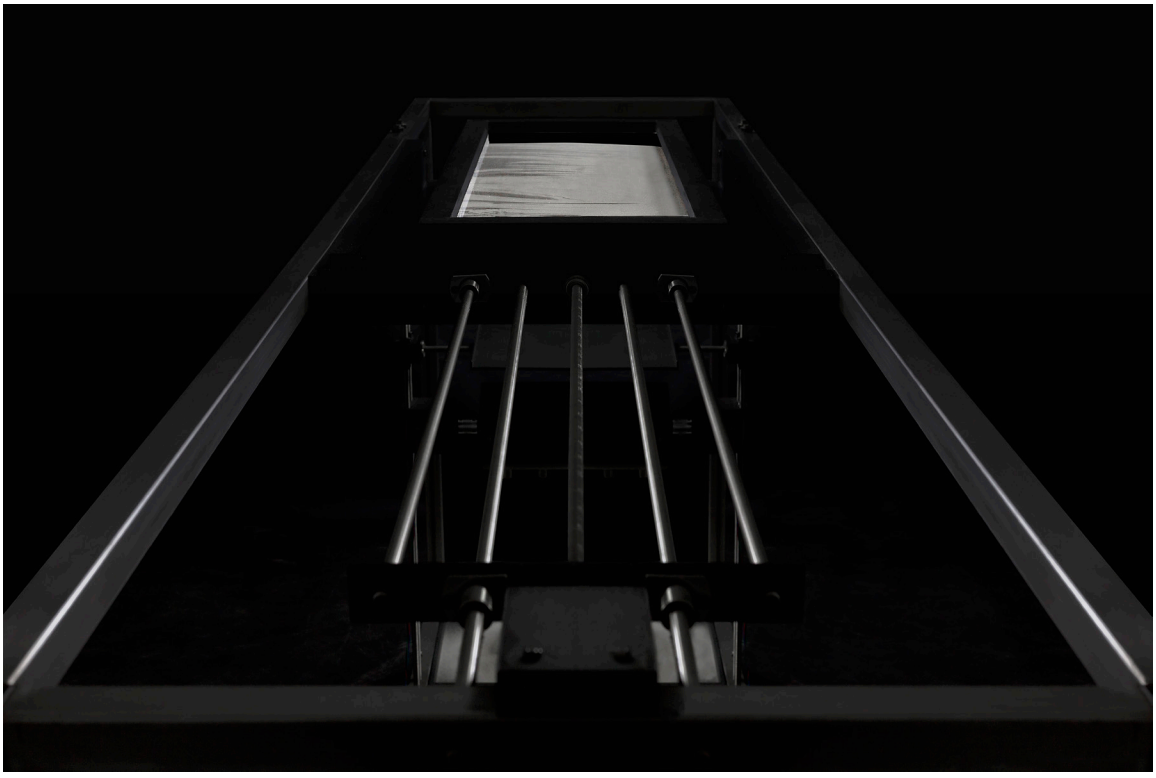

FIG. 28: DETAIL: PUSH MECHANISM

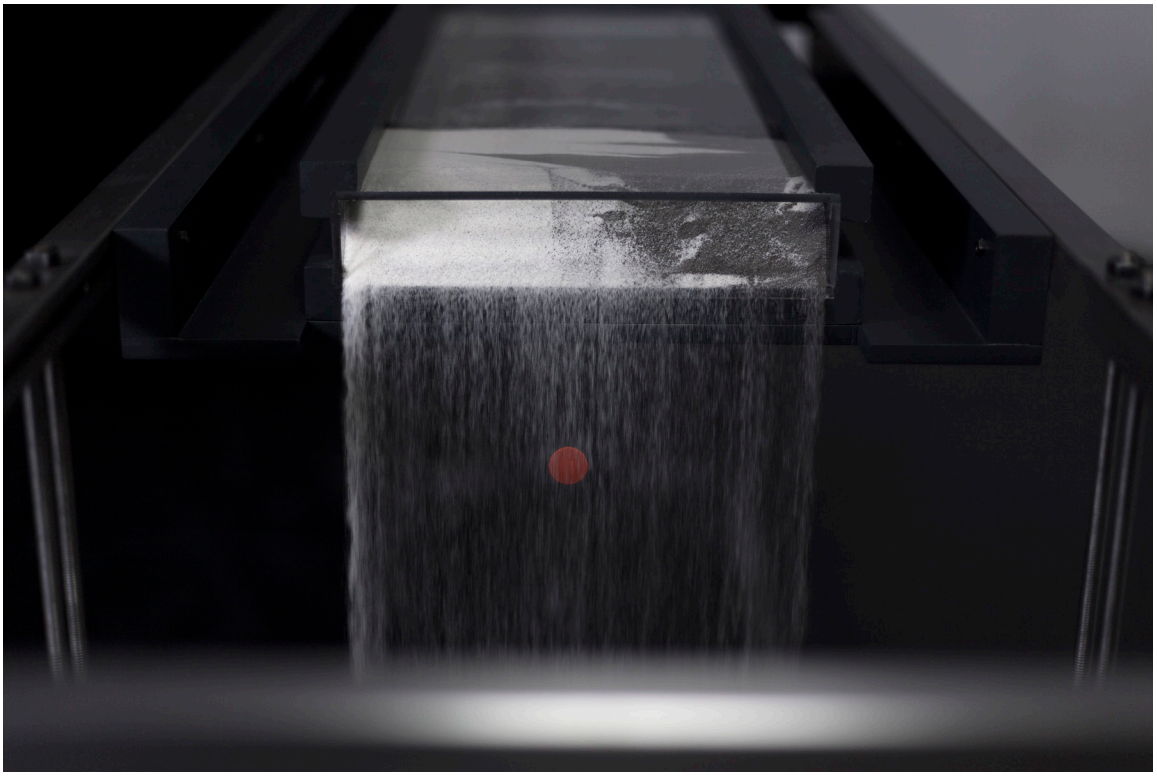

FIG. 29: DETAIL: ORE EROSION

FIG. 30 P. 46-47: EROSION OF THE ORE AND THE SORTING MECHANISM (MAGNET INTERFACE)

FIG. 31: DETAIL: PROCESS OF SORTING

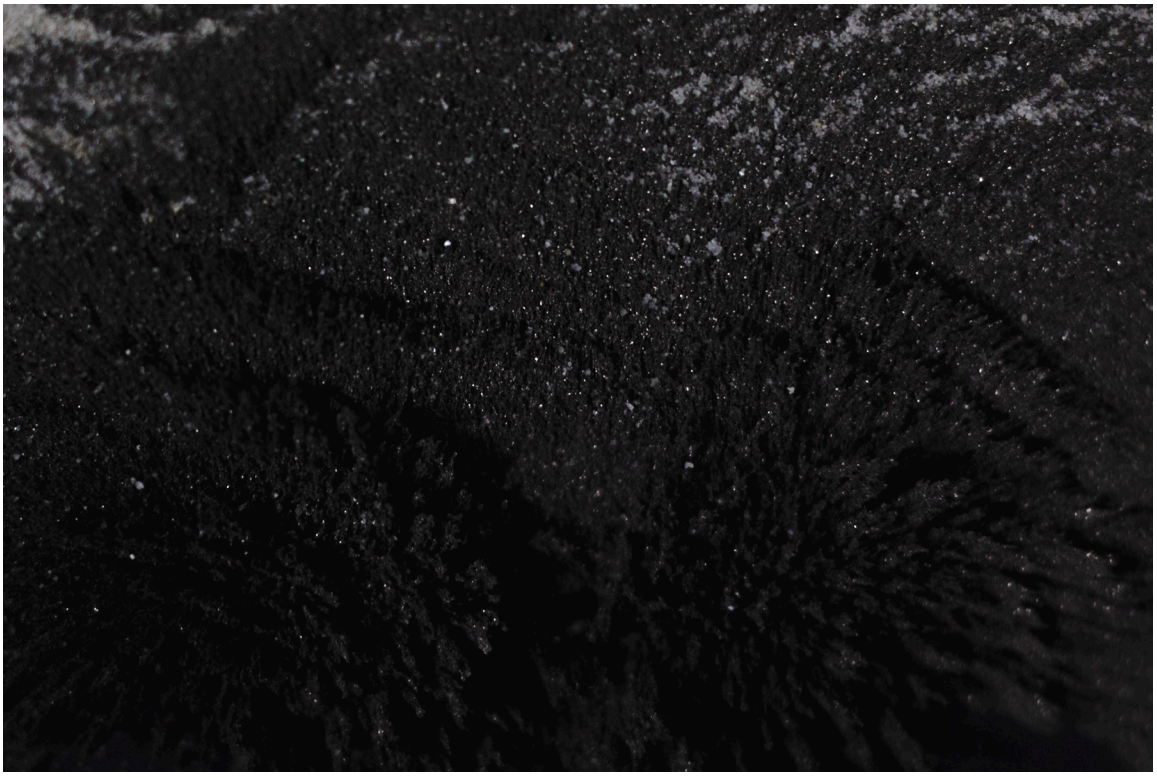

FIG. 32: DETAIL: PROCESS OF SORTING

> *"All of this happens at the same time. It is at the same time that lines of flight connect and continue their intensities, whip particles-signs out of black holes; and also retreat into the swirl of micro-black holes or molecular conjunctions that interrupt them; or again, enter overcoded, concentricized, binarized, stable segments arrayed around a central black hole."*
>
> DELEUZE, GUATTARI, 1987, P. 224

Speculatively, the acceleration of such process could produce all the more thought instead of more and more habit through recognition processes. But "*strata are acts of capture*", and they "*operate by coding and territorialization upon the earth*", proceeding "*simultaneously by code and by territoriality*" (Deleuze, Guattari, 1987, p. 40). Thus when we interact with a text message over an already highly stratified form of black-boxed Earth (refined over a myriad of processes until its parsing into an electronic component), we produce nothing but further capture, further stratification, further segmentation down the line. It is, once again, on the habitats of encounter where the residues are produced, where otherness is encountered, the concrete habitats where thought still may escape its capture. Engaging with a habitat of recognition in its first degree, is thus engaging with the moments when thought is still made possible, where recognition still leaves space for the unrecognizable. Residue is thus a trace of potential escape from the taming of code, from the power of the segmented line, an act of resurgence and resilience in itself. If instead of proceeding and accelerating further and further the processes of refinement, infrastructures and its machineries could be turned back at themselves: residues would be re-inserted inside the very recognition process, and instead of proceeding by encountering the refined segment that through iteration would become more and more captured, recognition would always encounter the otherness produced by its own process. Thus this acceleration could generate a state of tension between what is recognized and what is unrecognized leading not to the production of solely refined habitual stratified records of infrastructural intra-actions, but records of the very struggle and tension of recognition itself, of the very paradoxes of reading and writing, and records that bare the landscapes and potentialities of its own untaming.

FIG. 33: MACHINE THAT WRITES THE ORE AND READS THE RECORD

FIGURES 33-37: WRITING OF THE ORE, READING OF THE RECORD

The writing of the ore is achieved by the reading of the record and the sedimenting of its residues. An empty ore is manually assembled in the machine's center, and the two types of particle are slowly dropped within it according to the simultaneous reading of a previously completed ore. As the empty ore is filled with particles, the appearance of the nuances and changes between what is read and what is written arise from the material configuration within the ore, where the ordered mechanism of the machine on reading the discrete values and translating it into movement is put into tension with the residue imputed as source composite. The written ore is later exchanged with the read one via manual labor, where what is read becomes written, and what is written becomes read.

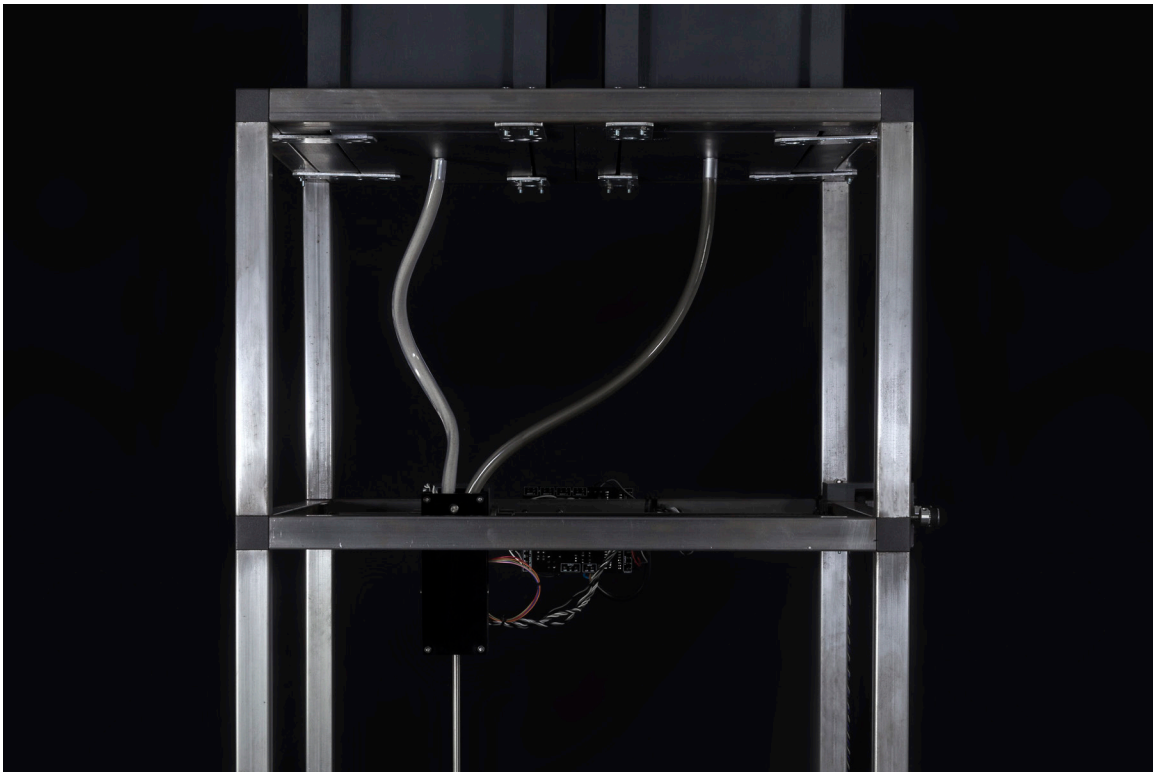

FIG. 34 P. 52-56: SEDIMENTATION OF THE ORE IN PROGRESS

FIG. 35: DETAIL: 2-AXIS SEDIMENTATION MECHANISM

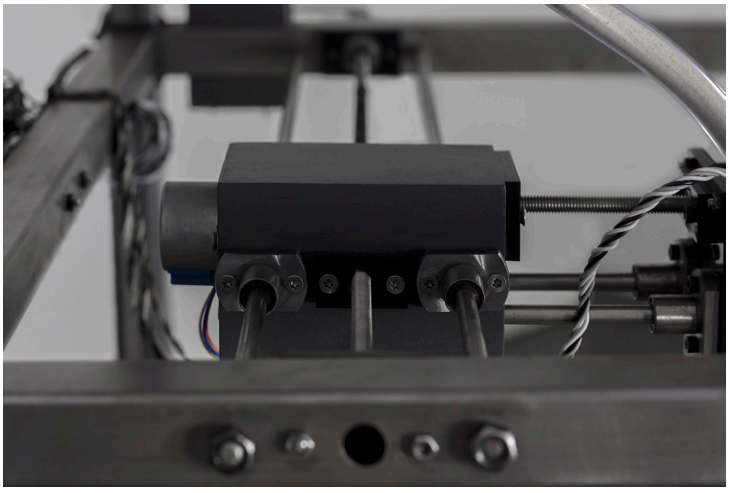

FIG. 36: DETAIL: 2-AXIS SEDIMENTATION MECHANISM

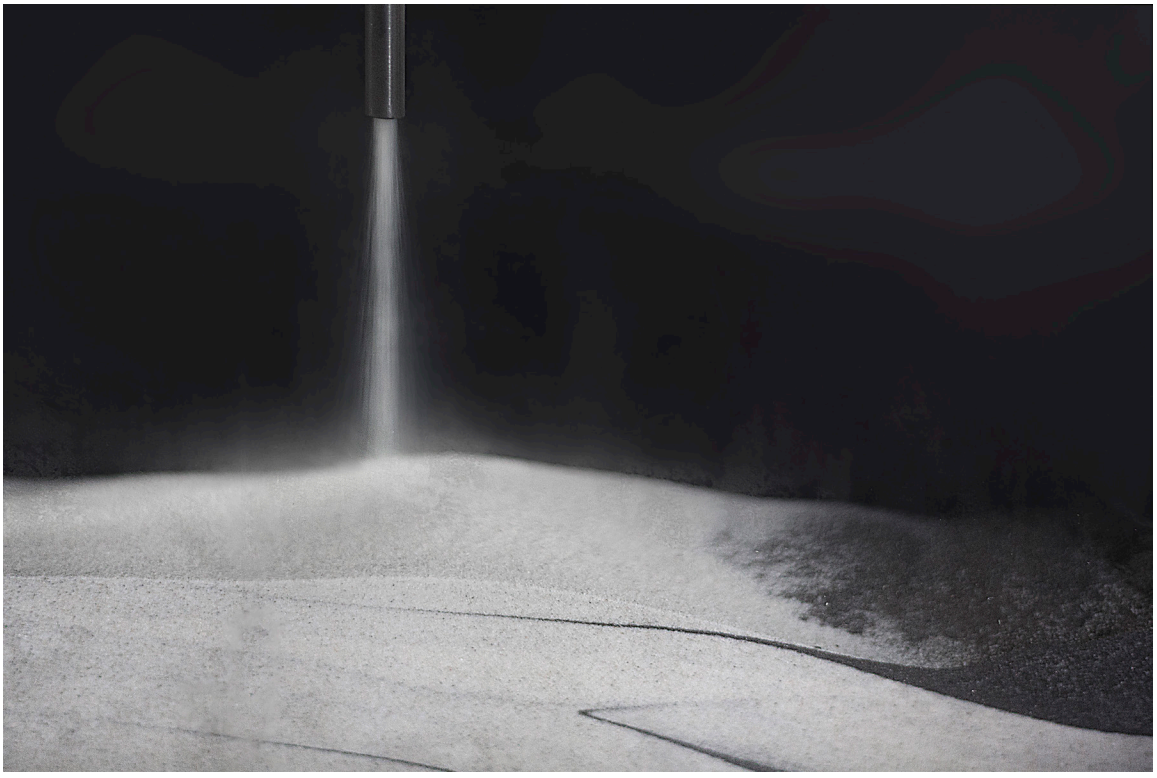

FIG. 37: DETAIL: SEDIMENTATION OF THE ORE VIA
THE READING OF THE RECORD AND ITS DISCRETE VALUES

FIG. 38: ORE (SILICA SAND AND IRON POWDER)

FIGURE 38-41: ORE AND RESIDUE

The ore and its residue expose the tensions between distinction and convergence. Via the recognition of the ore, both value and residue are produced for an economy of thought. The ore, exhibiting predominantly the distinction of value, cannot escape the agency of the residue. Whereas the residue, cannot escape the taming of the ore. The ore as an enclosed data-cartridge, the residue as a potential data-landscape. On a habitat when both encounter its infrastructural habitual loops, the agencies of distinction and the agencies of convergence both entangle upon the same record by a labor of recognition.

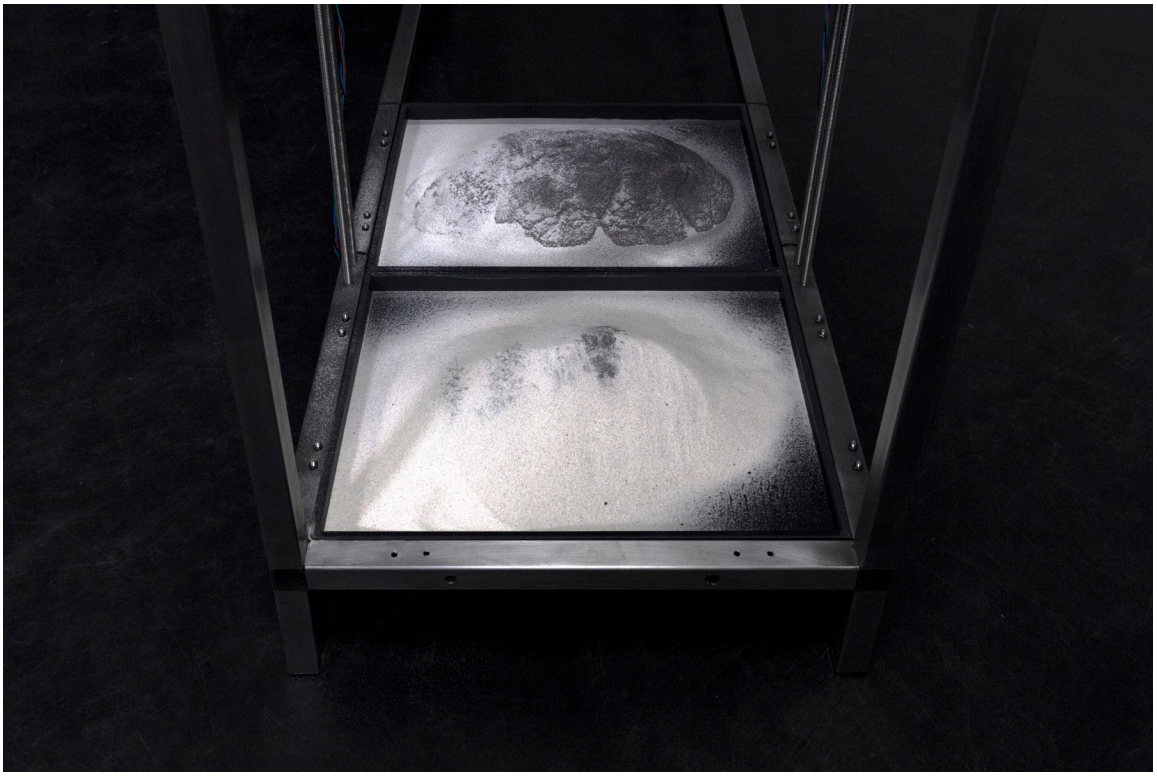

FIG. 39: RESIDUE COMPOSITES (SILICA SAND AND IRON POWDER PARTIALLY SORTED)

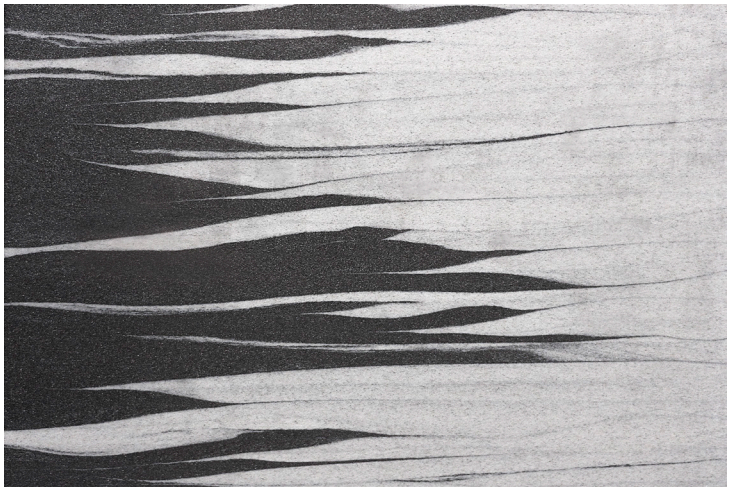

FIG. 40: DETAIL: ORE

FIG. 41: DETAIL: RESIDUE COMPOSITE

But to unpack infrastructural realities and to conceive an imaginary habitat of recognition and its processes, is to invariantly struggle with a speculative endeavor. For the refined and segmented realities of present day technologies have turned these processes automated, outsourced, and thus black-boxed to such an extent, that we can only imagine them. In fact, most of these places are even enclosed by layers of legal segmentation that renders impossible for one to effectively trace each infrastructural thread down to its core habitat. Infrastructures are part of the habitats of living as we are an integral and crucial part of its own working, yet, we are denied access to them. We are unable to grasp and concretely encounter them, we can only imagine their inner-workings as well as rely upon their ongoing labor that sustain our habitual living. Thus in order to provoke change and engage into thinking, in order to engage with the concrete reality that is being produced under our bare feet via our own habitual thinking, and foremost in order to escape the capturing of thought into segmented habitual strata, these infrastructures have to be enacted and made present. The paradoxes they enact happen only through lively, present material intra-actions since the abstractions of purely mental thinking engage only with the discrete, recognized forms of an encounter with matter. Matters have agency and are part of different cognitive processes that escape our own possible imagination. Enacting their processes concretely on a habitat of recognition that enables the engagement with its otherness, inner-workings, records, ongoing processes and labors of black-boxing, may give agency not only to the residues, landscapes and lives engendered in the concrete infrastructures themselves, but would make thought possible to occur and escape its habitual traps of capture to new unforeseen territories again.

Intermediate Discussion

"What if it takes sensing the abyss, the edges of the limits of 'inclusion' and 'exclusion' before the binary of inside/outside, inclusion/exclusion, mattering/not-mattering can be seriously troubled? What if it is only in facing the 'inhuman'—the indeterminate non/being of mattering and not mattering—that an ethics committed to the rupture of indifference can arise? What if it is only in the encounter with the inhuman, in its liveliness, in its gifting life and death its conditions of im/possibility, that we can truly confront 'our' inhumanity, that is, 'our' actions lacking compassion? Perhaps it takes facing the inhuman within 'us' before compassion—suffering together with, participating with, feeling with, being moved by—can be lived. How would we feel if it is by way of the inhuman that we come to feel, to care, to respond?"

BARAD, 2012A, P. 81

In order to confront the very inhumanity of the agencies within our own habitual technologically-sustained lives, this study turns present the very abyss upon which the intra-active elements that produce it first meet. By encountering the inhumanness of infrastructures, the indeterminacy of digital machineries, and all the matters that are habitually made forgotten by our present-day technologies, we open up space for a new negotiation and change of thinking; one that only happens by, and intra-actively with, the liveliness of matter. Our strategies are to sustain not matters of recognition neither representation, but matters of production and meaning. Our effort in the present study may be partially a maneuver of speculation and staging - staging something that happens elsewhere, staging something that can only be speculated of. But it is mainly an act of opening up, of making certain realities and certain matters to intra-act and affect change on the present without its habitual constraints, made present before ourselves and our senses through its enactment. What we do is a maneuver of making ourselves intra-act with the otherness of all sorts of matters, but also a maneuver of enabling matters to respond and intra-act with the otherness of our own thinking. A manner of expression and perception, a matter of meaning, both human and non-human. A matter of art.

But our reasoning on the critical matters of the digital may mean something different than it meant during its historical flourishing. The digital has never been more material. Be it in the way by which it inscribes and organizes labor, be it in the physical infrastructures that produce its hardware and its social/environmental impacts, be it in the physical infrastructures that sustain its networks of operation and computing on both within the Earth and above in its stratosphere. And if we ought to investigate, speculate and engage with digital technologies critically, it is indeed the time to access its infrastructural basis of operation, for it is this code that remains unchanged and detached of our perception by the habitual mechanisms of power, for it is this structure that intra-actively creates the realities we live in with all its messiness, inequalities and troubles in devious, unperceivable ways. Thus in this milieu, our work not only engages and exposes the otherness of algorithms and machineries to perceptive situations, but also engages and exposes its ontological sites, its territories of material encounters that are intra-actively core elements of it. An infrastructural turn, where machines are not only algorithms and interacting mechanic parts, but whole habitats of intra-action that matter.

Ultimately, our study has not aimed to be a recognizable and tautological answer to the problematics exposed. But it has hopefully enacted more contingent indeterminacy. For it is nothing but a maneuver for making kin and engendering response-ability with habitually neglected ever-emerging human and non-human matters.

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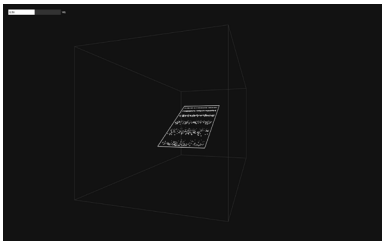
Appendix

STACK OF AUXILIARY DEVELOPMENT PROCESSES

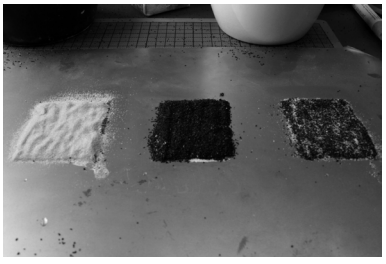
Digital desktop



Simulation (Processing): sorting by speed

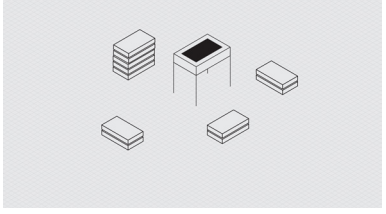
Experiment: sorting sand with magnet

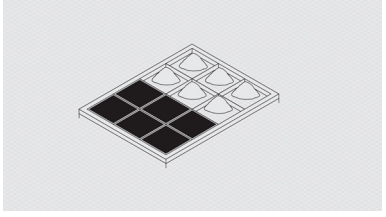
Analog desktop

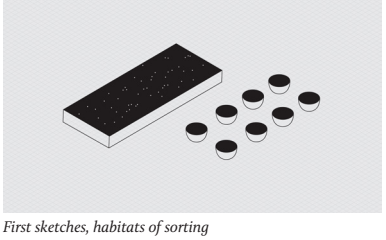


Experiment: amalgamating sand

Experiment: placing salt and black sand on ore

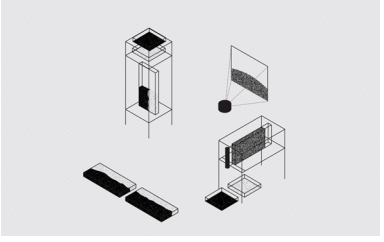




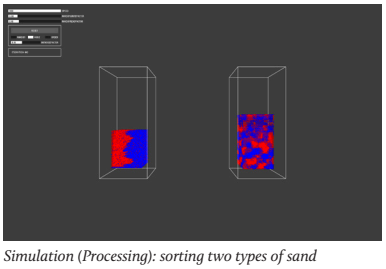


First sketches, habitats of sorting

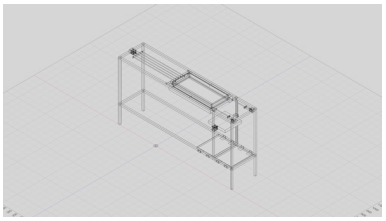
Experiment: iron powder and radial magnet



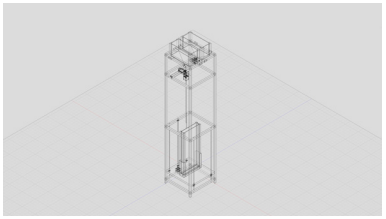
Sketch: Installation planning



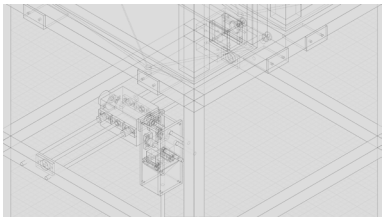
Simulation (Processing): sorting two types of sand



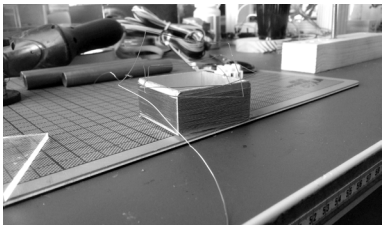
3D Design (Fusion 360): reading machine



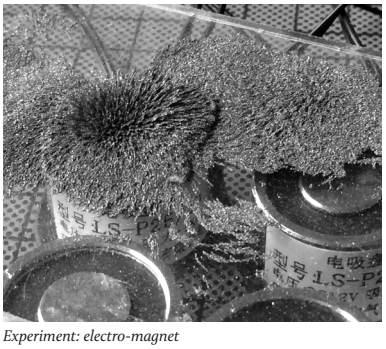
3D Design (Fusion 360): writing machine



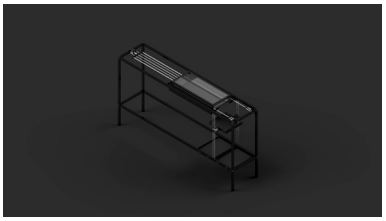
3D Design (Fusion 360): Detail: Writing Machine



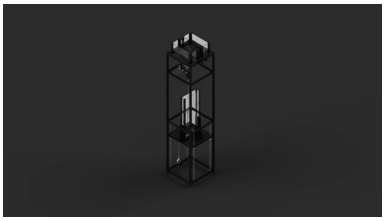
Experiment: DIY electro-magnet (coil)



Experiment: electro-magnet



3D Design (Fusion 360): Render: reading machine

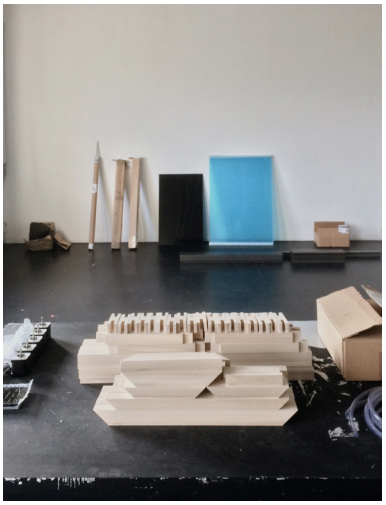


3D Design (Fusion 360): Render: writing machine

Wood Working: Karl Robert Strecker (cutting)

Wood Working: gluing and sanding

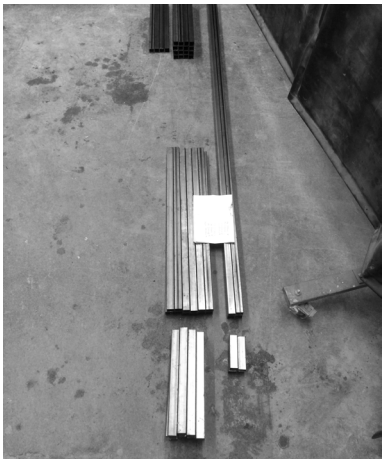
Wood Working: lack and painting



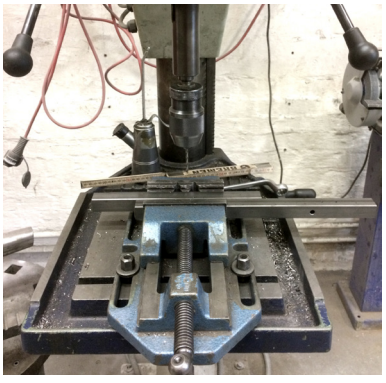
Starting of assembly

Wood working: gluing

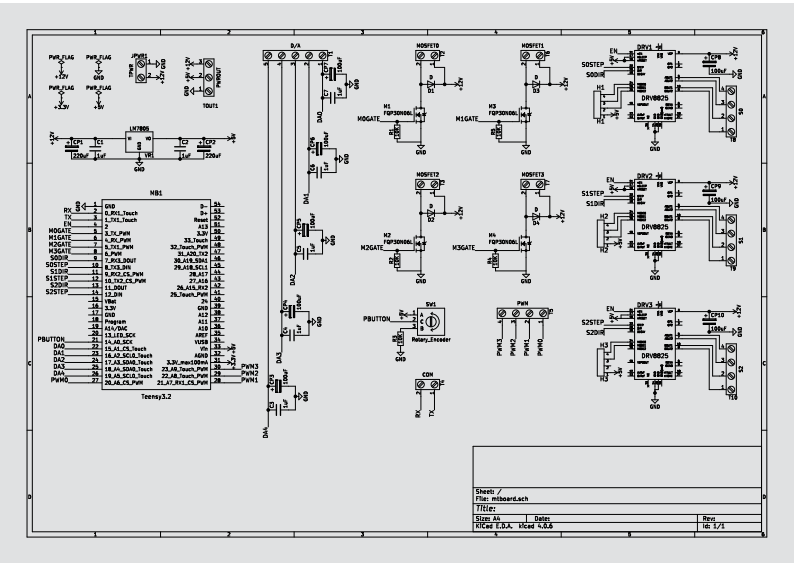
Metal working: cutting steel frames



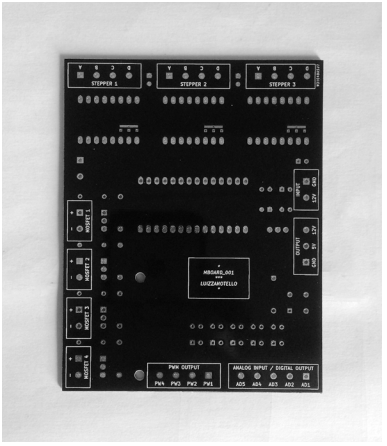
Metal Working: cutting and grinding steel frames



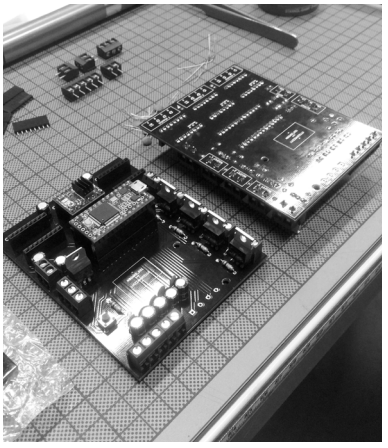
Metal Working: drilling steel frames



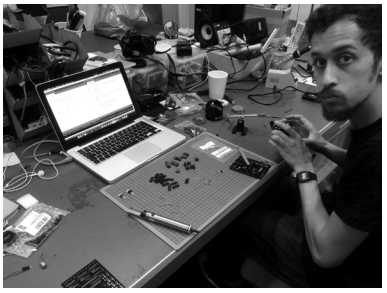
PCB Design (Kicad)



MBOARD_001 before soldering

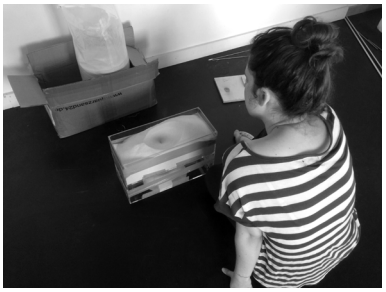


MBOARD_001 with soldered components

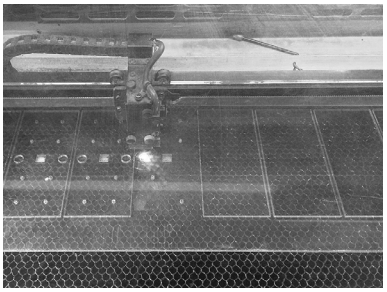


Soldering and further assembly support: Julian Hespenheide

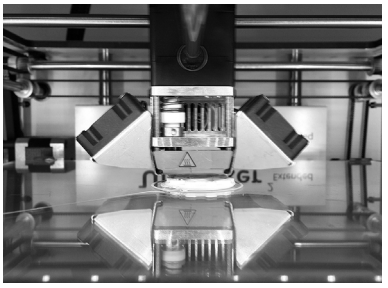
Assembly



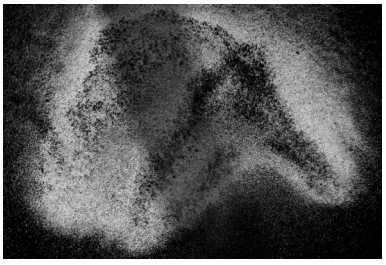
Construction and further assembly support: Mariana Basso



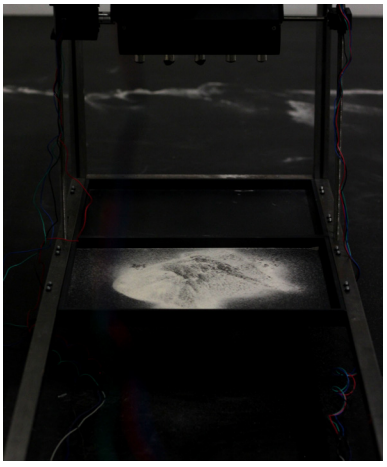
Laser cutting



3D Printing

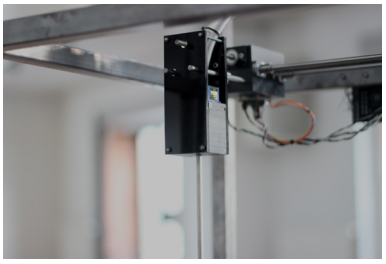


Assembling and testing the filtering (reading) process

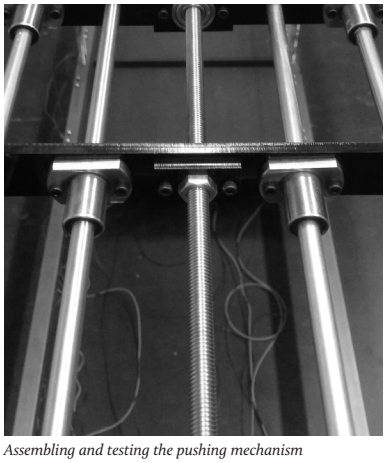


Residue composite

Residue composites



Assembling and testing the writing machine



Assembling and testing the pushing mechanism

Residue over the filtering plate