

Augmentation and the Visual Mind

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Abstract. This paper discusses the User Interfaces of digital technology as locations where two different fractions of human thinking and being meet each other. A survey on either side of the boundary between logical and bodily domain reveals interdependencies, contradictions, ideological positions and approaches towards a creative process of user interaction. Based on considerations about creation, relevance and appreciation of visual expression regarding to digital graphics, User Interface and Interaction Design a perspective will be proposed; focusing the unpredictability of human creativity as the Key-Element in Interaction.

Keywords: augmentation, democratization of digital technology, digital graphics, Logical-bodily-Boundary, sensomotoric interaction, sublime dispatching, Multimodal-Interface, visual demands.

1 Preface

Computers are only possible due to the existence of formal logic. Everything what can be made with computers is result of formal logic. Therefore interfaces between computer and human being are imperative to consider as formal logic.

Starting from this rigid position, this paper will describe a journey along the skin, where two fundamentally different fractions of thinking and being meet each other. On one side we will have a look at the clear and incorruptible manners of truth, deduced by the use of formal logic. Here everything is either 100% precise or does not exist. Fuzziness is not allowed and therefore we become aware of an extreme powerful and sophisticated cognitive tool. Opposite of this, we can find things in disarray. We face fuzziness, excitation, passion and vehemence, here we face one of the most unpredictable subjects in this world, the human being. And this human being is using digital technology - not to answer the question about the ultimate truth [1] or to construct valid statements based on any given propositions, but to listen to music, to send tweets around the globe, to create graphics consisting of shades from gray or to do any kind of bizarre non logic things.

In this paper we want to adopt various positions on either side of the Logical-Bodily-Boundary, to conduct a dialogue in between those two concepts.

2 The Context Becomes Fuzzy

To consider the use of digital technology as an iconic activity in contemporary societies, not only in developed countries but worldwide, is nowadays not breaking news. Within a timespan of a few years [2] digital technology has become subject to unprecedented democratization. All of us are well familiar with digital user interfaces. The playful interaction, wiping on a surface of a smart phone, a tablet or the touchscreen of an ATM gives the user, the Inter-Agent, a feeling of sovereignty, of control, of mastership upon the tasks, arising from his/her social network activities, ubiquitous online communication, mobile businesses and so on. Facing this playful confidence and considering the human interaction with digital technology not too long ago, renders typing a Command-Line similar to cave painting. Considering this dramatic change urges a closer look to the manners and regions where interaction takes place.

On one hand, the logic inside the machine needs an unambiguous diction, which the person in front is, of course unable to deliver by ordinary language. One of the first attempts to deal with this has been introducing artificial languages, which were to be learned by humans in order to formulate proper tasks to be understood by the machine. Despite of their precious work in the heart of the machine, the artificial languages got more and more dispelled from the surface by manifestations from the pictorial domain. The One-dimensional function of the text, which ruled the early terminals undisputedly and which could order a window to open now was banished in to a window, which quite seldom shows up on most computers today. The Two-dimensional visual representation of the desktop metaphor, proved its superiority in formulation of instructions accessible from the inner core with ease. Visual concepts such as proximity, contrast, color, balance, resemblance, empty space, consistency and typography took over. Considering the demand of discrete input by digital technology, it is remarkable that particularly visual concepts, which are anything but logical, proved to be an alternative to a text in a command line. None of the concepts mentioned above can be derived from logic. In any case, the opinion of a human being is required to tell what resembles what [3] or when a visual balance of objects in an Image-Space is achieved or where empty space contributes to the overall appearance of a graphic. These functions cannot be done in by any kind of formal logical or mathematical equation.

A view from the “inner side“ of the machine can give us the idea of insufficiencies of the human Inter-Agent. Therefore User Interfaces can be considered as a layer enveloping the core, as operating to guide the users perception, to limit his options, to stagger his requests and to schedule his interaction - in short, to “optimize“ ordinary human behavior in to binary relevant expressions. Form this point of view, the core; the logical domain obtains primacy over human weaknesses. To justify this standpoint we may recall, that the interface with all its procedures and visual appearances to the last pixel in an Anti-aliased line, is 100% determined by binary logic.

On the other hand, it becomes clear that Graphic User Interfaces relive the user form dramatic “logical overload“, which is unconditionally necessary to keep the machine operating, but which is absolutely meaningless from the user’s point of view.

For him e.g. the position and extent of a window on his screen in numbers is absolutely not relevant. To change size and position he also does not need to know any value. He just clicks, moves and releases the mouse button. If he is not just a beginner in using computer, he will probably not even notice this interaction. Moreover, he will get the impression of stickiness in case that GPU delivers not enough performance to draw smoothly and with steady movement. This unconscious interaction and the impressions, moods and feelings during the interaction, are making an important point in deliberations about augmentation related to User Interaction Design. If we use a hammer, if we drive a car in rush hour, if we create a drawing on paper or on a screen, the fact and process of holding, of moving, of using the tool is usually not part of our perception and consciousness - again, if we are not just beginners in using the specific interface. In the case that a person is trained in driving a car or creating digital graphics or using a smartphone, the "what" question quite likely can be answered from a standpoint within the logical domain - the "how" question in contrast obviously not. But if we are focusing on the process of interaction between the digital and the humanoid world and not on statistical surveys about clicks on a certain button within a defined target population, the "what" question tends to become meaningless. The "how" question on the other hand, does not need to be answered in words or numbers. Usually the "how to do" question gets best answered directly by the interaction. If a person is using a hammer, he is not required to calculate mass and force and acceleration to bang in a nail, which answers with some luck the "what" question. But if this person is a skilled mechanic, he gets not only the task done, but due to his experiences in working with metal, he feels the deformation of the material, he gets an intuitive awareness when rusted bolting start to loosen under the applied pressure, he gets an instant Non-Formal information about the process he is doing while he is doing it. This gives him the ability to achieve probably more exiting results in metalwork than just hammering a nail. If this person is an illustrator or a Graphic-Designer he or she will have similar experiences. People who are working professionals in this sector know about their tools intuitively very well. They are able to feel the rigidness of graphite and the friction of certain papers; they know how to shade a gradient to make the spectator believe in Three-dimensionality. They are usually very Well-Trained in perception and embodied movement, creating astonishingly visual expressions using the pictorial concepts mentioned above. But asked how to do this, they will be unable to formulate anything that is even close to a formal description or an equation. One reason is, that during the creative process the person, the Inter-Agent, is fully engaged, is spectator and creator in one All he/she wants is a continuous flow, a non interrupted process, a bilateral iteration between the visible and the imagined, whereby the imagined should not consider to be something predefined. If the human body and brain would work perfectly logically, nothing of this would be possible. We would be unable to create, unable to learn or to perceive, we would be, in the best, case a sort of logical zombies. Back again to the place where the interaction takes place and seen from the user point of view, we get aware of major changes, which have occurred in conjunction with the appearance and the vanishing of mouse on our desktops. In reference to the replacement of the Command-Line by a Two-dimensional face, the direct finger access indicates a

transition from the point to the line. Due to enhanced graphic performance Touch-Sensitive Interfaces providing a more direct response and if the interaction is fluent, the act of interacting disappears from the awareness and gives space to processes which are closer to the sub consciousness and more oriented to answer “how“ questions. This interaction is not formal, not verbal, not noticeable and therefore inaccessible to anything from the logical domain. Nevertheless, due to the human Inter-Agent, a synthesis of these both concepts, leads to something new in computer generated output, but also in a metaphorical sense to a significant expression, with is comparable to the introduction of the typewriter, with all its connotations.

Up to here we have been conducting a historical analysis. Before we are going to make an attempt to extrapolate, an initial summary should be done. This characterizes the Human Computer Interface to be a boundary and a bridge in same time. To formulate reasonable statements, it is necessary to adopt a distinct point of view. Either from the perspective of the formal logic, where any solution is correct as long the process leading to is formally right, regardless of the input - or, from a Common Sense perspective, where the processes inside, behind the graphical surface, are not relevant at all. A third perspective seems to be not possible, which suggests understanding the interface between the two concepts as a skin with Zero-Dimension in thickness. Characterizing the two concepts meeting here, a distinction between the “what“ and the “how“ question might be helpful. The “what“ question is much more likely to produce answers, suiting the digital domain. It can easily be answered by single expression (he is using a hammer). By a small tweak this can be transformed in the “if“ expression (if he is using a hammer, this sentence is true) and this is already digital logic because of tertium non datur, no third answer is permitted. To get logic to work in a computer, millions of these expressions need to get executed, some with other conjunctions (else, or, nor...) but always producing valid values. For a digital interpreter this is the way it works and it is the only way it works. If the tasks to process get more complex, the only answer can be to increase the number of logical operations in shorter time spans to keep the output fluent. This characterizes the digital technologies as mechanical and extensive.

If we are talking with human interpreters about e.g. Digital User Interfaces, the “what“ question and the following “if“ expression are less important because normally easy to answer by evaluation of perceivable situations (yes, he is using a hammer). But answers on this level are not able to give us the impression focusing the essence of the actual situation. If we want to get satisfactory answers the “how“ question provides a much boarder access. The answers to this question are infinite in numbers and not limited to be binary. From a logical point of view, this is a nightmare, but strange enough not for an ordinary human being. For us this means freedom [4], means to be able to think totally new, to be creative in any way. Moreover, the answer we are able to give on the “how“ questions do not need to be formal nor necessarily manifest. A dance, a gesture or look can be a valid answer to “how“ questions. This ability to give sufficient but not necessarily true answers marks the advantage of human beings in relation to any kind of digital technology. As already mentioned above, a human Inter-Agent who is engaged with a task on a digital interface loses consciousness, not in a way as LSD may provide, but about the

fact using a device and interacting via an interface. Under this aspect the process of learning plays an important role. As mentioned above the skill level of the Inter-Agent can be seen as a decisive parameter. People who are about to learn something practical, e.g. to use a certain interface, need more time to fulfill a task than a Well-Trained professional. This is obvious - but why? What is its actual difference? Sure, on the first level the knowledge about specific facts, but why do people fail e.g. the practical test in a driven school despite their success in the written examination? No question, because of their insufficient experience: in distributing attention while in crowded Traffic-Situations, in handling the pedals and gear stick, in staying cool also in tense situations. Sure, a beginner has no idea where to put the attention first. He has no idea how to interact fluently. Therefore practical training exists, not only in driving schools, but also in drawing classes, computer courses and everywhere wherever pure unextended knowledge is not enough to master the task. What becomes clear from these reflections, at first looks extreme trivial. We need to practice to make perfect difficult tasks. But looking further there is something more. Driving a car, using certain software, creating a drawing from a given set, is for people who do this frequently anything but difficult - also their appreciation about the difficulty of the task changes. The important thing here is, they are able to forget and they are able to do the specific task without thinking, without cognitive processing, without any logic. They shift the gears without being aware of it, they scroll through the interfaces as if blind, they create outstanding graphics by recognizing sublime differences in visual perception, sensomotoric interaction [5] and respond to non verbal expressible visual demands. The reason why a human being, despite of their insufficiencies in formal diction, is still standing out of any computer is because we are able to forget things which become autonomous from thinking due to practical training. We don't need to think about where the clutch is, how to shade a sphere or to draw a cube in convincing perspective, or which button does what - after being trained we are free while the computer needs to calculate everything always anew, with the same perfect result. Knowing this, it becomes time to turn our attention to the future of User Interface Design and to try an extrapolation. In means of technology, this appears not to be very difficult. There is no reason to believe in a change with regard to the constant dematerialization. The extent of the devices will further shrink as has happened in the past, from the levers of the Hollerith to direct finger access of the mobile phone. But this is only half of the story. It is quite likely that the functionality of mobile devices will also decrease. Due to faster networks, resources intensive tasks might be outsourced from the personal piece of technology to some backbone technology, which is cloudy and therefore less in public focus. Due to the fact that Logic-Based technology is an extensive enterprise this sector still expands in extent and performance, bringing along also social implications about the question of further democratization.

From an Interface Design related position, predictions are more difficult to make. Reviewing the past reveals a continuous reduction of distinct haptic interactions. From typing a clear and unambiguous expression, to the mouse click, to a fuzzy gesture at a track pad or a glass covered Graphic User Interface, the interaction gets faster and less precise. To predict something in this diction we may consider that the

development has been less stringent than in the technical sector. So e.g. the attempts in creating spatial distributed User Interfaces can comprehend to be less convincing. Being optimistic, the adoption of a more human like behavior, of a design which takes the human being more seriously, which can solve the learning problem mentioned above can point in the right direction. Thinking of technology and design together and considering the past as a more or less straight development, a more Long-Term prediction can be the disappearance of hardware and also of Two-dimensional User Interfaces through a process called augmentation. Adopting a the position of a strong believer in digital technology and a bright digital future, a sentence such as: "Due to augmentation, using a Multimodal-Interface, Two-dimensional visualization of objects become obsolete." can be an program for User Interaction Design - to follow or better to think about. The latter will be done in the next section.

3 Picture 2D

Considering the claim form above, we may have a closer look at the concept called picture. There are lots of definitions, for what a picture is. A representation of something absent, a conglomerate consisting of a symbols pointing to certain meanings, a source of imaginative force making the spectator speechless, a non verbal expression, a piece of wood or just an ephemeral Two-dimensional manifestation on a screen. In terms of User Interface Design, the Two-dimensionality seems to be an important characteristic, not at least because of the attempts and the less convincing outcomes in creating Three-dimensional, spatial extended User Interfaces. Considering the Two-dimensionality as prominent feature of the picture, the visualization, the result of what Paul Klee called making visible, several approaches can be done to analyze this concept. From a syntactic point of view, the denial of the picture's Z dimension appears to be helpful in reducing complexity, towards something more essential. A Two-dimensional picture seems to be more handy in reality, but also in mind. Ignoring the wood, the paper, the layered paint does not really limit our perception or border our concepts or compromise the use of the term picture. Moreover, the omnipotence of the featureless Media-Interfaces even enhance the impression of the picture as something Material-less, which needs to be in Two-dimensions just to be perceivable. A Two-dimensional thing is more easily framed and stored in folders as a hardcopy and at the desktop metaphor. From a semantic perspective, the Two-dimensionality of a picture also has something charming too. So, the position and the extent of something that is considered to be a sign, of something seen to be the origin for a perceived meaning, can be easily described in discrete values. The distinction between picture, frame and non picture in Two-dimensionality can easily be done, just by a ruler and the idea of the picture as an insubstantial Image-Program, consisting of meaningless elements, combined in a certain manner, able to express anything, also does not depend on the third or any higher dimension. A confrontation with the Two-dimensional picture seems to be also more convenient, because there is already a flat front. Also, from a pragmatic position a Two-dimensional picture is most attractive in handling, hanging it on a flat wall (gallery),

putting it in front of the audience (cinema), setting up a clear spatial situation (signage). Not at least, in means of user interaction, Two-dimensionally is an indispensable prerequisite for any kind of wipe.

Actually, the Two-dimensional picture/Picture-Program is a nice, smooth concept, everything is in a single layer, clear to distinguish, close to something essential ... and most obsolete, if we talk about augmentation. The reason for this is: regarding to interaction, the pictures Two-dimensionality is in the same way relevant, as the well known (never seen) back of rice somewhere in China. Seeing a picture as a picture is something totally different from seeing (interacting with) Leonardo's Mona Lisa, Klee's Highway and Byways, a motion picture, or a Graphic User Interface. Slicing a picture into discrete portions of information, as e.g. size, format, color, semiotic references and so on, might contribute to the amount of formal knowledge in this world, but will also dissolve the picture itself. Who would consider a black painted 79 by 79 cm square of canvas as something meaningful: if it would not be known as the "Black Square" by Kazimir Malevich? To understand something about a picture - interaction matters. The manner of interaction, the duration, the spatial relations, the knowledge base, and also the spectator's mood making the picture become reality and relevant. This cannot take place in a Two-dimensional world. Considering the Human-Picture interaction shows, there is not difference from ordinary Human-World interaction. It is dynamic, highly movement and body related and quite less a matter of pure logic. Pictures are able to generate pleasure, fear, excitement, sadness, ...but only during the interaction. Pictures are neither Space-Wise nor Time-Wise stable things. A static view focusing on a picture would fail to see anything. Only a moving eye is able to recognize, and movement is already defined to be function of space and time. Pictures are unable to exist independent from the human mind. Considering this, a picture can be understood as something between the reality of things and the reality of mind as an in between reality, also known as Interface.

4 Augmentation

After interrogating the term "picture" now augmentation comes into focus. If the context is given by the framework of User Interaction Design, Augmented Reality and all the connotations coming from this side - augmentation seems to be an idea, aiming to render itself unperceivable. Considering the story of Human Interface Design, and extrapolating the idea of a tendency in dematerialization and obliteration of discrete boundaries, a vector the Command-Line, over to the distinguished double click on a well framed icon, to the whip on an iPad - towards something multimodal, like an iPlug on one's head's backside or to 802.11.ac iFi can be drawn. This process can be understood as an ongoing augmentation, in which the interface itself, together with its Two-dimensional visualization becomes obsolete. Thinking through "augmentation" to the very end, not only the interface will disappear in Multi-modality. In a totally augmented world, which is the actual promise of this term, everything is not on your fingertips anymore, but on your synapses' endings. There would be no visual overlay, showing a building's name or the best deal within a

radius of 150 m. We would know the building's name (if we want to or not), we would have already submitted our credit card number (regardless of the deal) and we would be unable to know what is caused by augmentation and what is the Un-augmented reality. Moreover, we would not be able to know about the Un-augmented world - and because of the in distinguishability, augmentation also would not exist.

5 Sublime Dispatching

Just before we get lost in an ideology of augmentation - we may consider Roland Barthes idea of sublime dispatching [6] in front of this backdrop. Doing this unbiased and with conviction that human being and augmentation are not alternatives, it becomes clear that an augmented world does not need necessarily to be weird, dark and controlled by an evil mastermind. Because: if someone is the subject of sublime dispatching, perception must be possible. And if perception exists, total augmentation is impossible. Reviewing the idea of sublime dispatching critically reveals it is nothing that comes from above by superior authority as the reading of "The Rhetoric of the Image" might suggest. Despite this, sublime dispatching is an essential factor not only in visual but also other forms of communication. It is an inevitable and deeply interwoven part of our (in the context discussed here) visual perception. It is actually a decisive part of our methods in making and understanding the visible. Everything we perceive and create pictorially appeals sublimely to pre- and sub consciousness [7]. Considering time base media at first gives us an approach to deeper insights. If we are watching a movie we are deceived in many ways. First we are convinced of seeing motion, literally a motion picture. Despite this we should know and certainly outside of the cinema we actually know, that a movie consists of 24 single frames projected within a second. Back in the cinema hall when the film starts we forget this fact immediately. We develop passion, empathy, anger upon light projections, upon seen personalities and characters we feel familiar with, again outside the cinema we know these are actors shielded by bodyguards or digital created illusions. We get scared and frighten if Godzilla does weird things or if someone is posing with a kitchen knife behind a shower curtain, moreover, also upon just imaginary imaginations such as the Blair Witch - and this is not just an ephemeral or a subsidiary deception of the mind. This leads to actual physical reaction while the mind is in a total denial of the real world, of anything outside the current imagination. We know, when creating a movie several techniques and technologies (more and more digital) are in use. We know a movie consist of acts, scenes, takes and shots. We know about shooting angles and picture composition and some of us know how to use this to create suspense, to evoke and to satisfy visual demands, to put the audience under charm, to make them forget the real world - to dispatch their attention and to a certain degree their physical reaction in a sublime manner. Yes, cinema is not the ordinary life and under circumstances, which are more harsh than sitting in a soft cinema chair, the tendency of losing consciousness and become sublime dispatched seems to be less likely. But if we use another example this conviction may change. To be in a foreign airport, changing planes, maybe under

time pressure is a situation requiring one's full attention. There is not much room for failure but there is still sublime dispatching. Modern airports are designed to handle huge amounts of traffic. Vast numbers of unpredictable, sometimes tired or easy to distract people, need to find their way from the arrival gate to the departure, immigration, transfer, baggage claim and so on, whereby they are unlikely to speak the same language. The way to organize this in an effective way is to establish a system, which guides and supports the passenger's movement unconsciously in the right direction. By organizing a consistent spatial situation, providing "to go" perspectives, by redundancy and placing of signage on positions where it gets perceived at first glance an information setup gets create. This leads the human Inter-Agent on a sublime level of attention to the right location. Whoever has been in a similar situation, tired from a delayed transcontinental flight, surrounded by a gabbling crowd, supposed to proceed immediately to gate number 211, threatened for unloading his baggage, knows that he or she is hardly able to find the way by formal deliberations and is happy for any sublime dispatching, which helps on an unconscious level. There are quite likely much more examples to find, rendering vast areas of the interaction humans are engaged with as determined by unconscious, sublime processes. On one hand this limits the chances to become overwhelmed by augmentation staged by some interest groups and aiming to change ones behavior in a certain direction. Despite of the capabilities of Big-Data-Domain the human perception, the human mind, the human consciousness appears still complex enough to prevent a total coverage of sublime dispatching or remote control by a subordinated mastermind. A brief look in the history ideological interference shows that state of the art technology was always used to distribute a particular ideology, to survey its impact, to reward or to sanction the related behavior of target populations - and that always enough people could stay independent from these attempts, being the seed of the changes to come. Another brief look in my kitchen reveals Roland Barth's to pessimistic perspective; there is no indication that Panziani could convince me to fill up my shelves with their products - neither on intellectual nor on a sublime level.

On the other hand, despite of the dark hunch and convinced to be independent enough in mind and thinking to conduct a widely self-determined life, the idea of sublime dispatching can mark an interesting position in understanding and creating User Interaction Design.

6 How to (Inter)act

From a digital artist's point of view, interaction consists at first, in a similar way as for the person at the airport and in the cinema, of sublime and subconscious procedures and only to a minor part of logical rationality. The computer does not exist while generating a graphic, an animation, but also while doing logical tasks as writing an expression. Everything unifies in a continuing process, which is only describable in retrospect. The creative work is characterized by immense inner tensions, not at fist because of external parameters, but because of an intense interaction between the, let's say imagination (despite of this is less than the have of what is actual meant) and

the perceived changes on or in the medium where the manifestation takes place. In this process nothing is sure, the idea, the intention, the actual situation in the mind is anything else than stable. It is under constant influences by the topic (if we talk about a work in an given contest), by the perception of the traces arising from the movement of one's own hand, the underlying mood and a lot more much more fuzzy parameters. This situation has much more to do with the idea of iteration, then with the myth of an artist, who gets an inspiration from divine in fusion or from another unverifiable source and consequently starts to form this on a canvas, a video or in an installation to make it perceivable. In reality, the creation of anything is already something new. But this is not a translation of a more or less sophisticated concept, but a struggle on relations, curves, composition and colors to reach a level of inner satisfaction upon one's own visual demands. If we are trying to organize this Visual Picture Interaction Process we can use four terms interwoven with each other: Perceptive analysis (1), perceptive synthesis (2), productive synthesis (3), productive analysis (4). Since this process is considered to be circular, it actually does not matter where to begin, but in terms of a narrative, the perceptive analysis (1) should be first. In this part the human being perceives the overall situation guided by the intension to achieve a overview of the spatial situation, the properties of the material, the subject if there one in case of nature study. This information will next be correlated to the experiences, the "traditions" this particular person has developed in his everyday life and due to the successful solving of visual problems. This can considered to be a perceptive synthesis (2). The result of this is not, or very, very seldom, a distinct pictorial idea but a mental state, which establishes the tension in between the imagination and the perceived actual situation on or in the medium. This is the basic force driving the artist forward, making him use his hands to create, to synthesize something within the image space in front of him. This is the productive synthesis (3). During this process the action on the medium - the canvas, the paper, the Computer-Screen - is under constant surveillance by the creator. Not only by visual evaluation, but also through a feedback of the whole body, the muscle tension in the arm, the nerves in the fingertips, the balance of standing... This is what is meant by productive analysis (4). Now some one may think: if a sufficient state formalization of the Sub-Processes can be achieved, cycling the whole thing on sufficient computing power might be the way to teach a robot drawing. Apart from the question, why robots should be able to produce drawings - there are some more difficulties. The formalization of the Sub-processes is already a highly ambitious enterprise, but thing are getting worse if we realize that this is not a strict circular process, which if repeated in sufficient numbers delivers a more and more accurate outcome. The perception of a professional in pictorial expression is so sensitive, that a tiny, hardly notable change in terms of visibility, vision and constitution, in the perception and thinking can cause major changes in the whole project. This is less serious than it sounds at first, because visual questions have always more than one, commonly infinite solutions, and in opposition to statistics and the Gaussian Normal Distribution, the less common, the most unconventional solution gets usually admired and considered to be extraordinary creative.

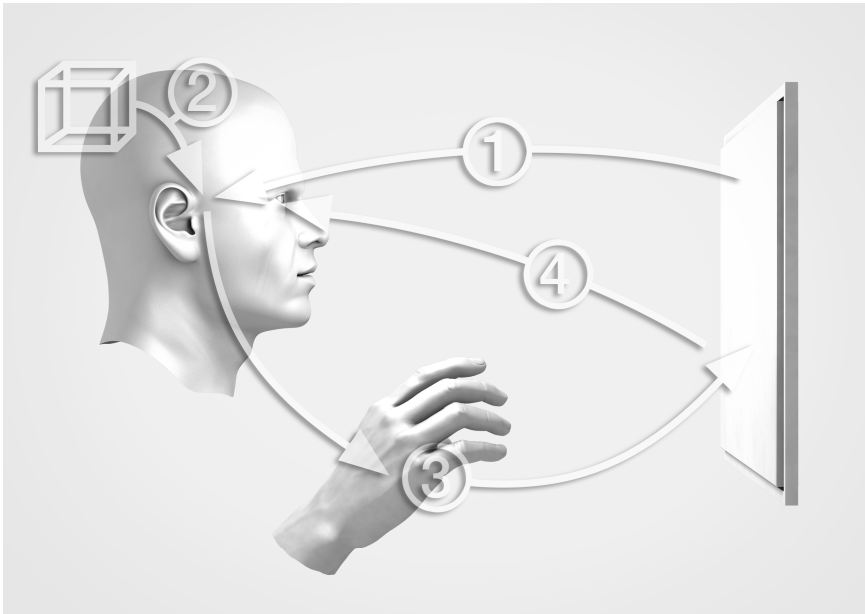


Fig. 1. Visual Picture Interaction Process

7 Conclusion

Everyone expecting to get Bite-sized findings, ready-made procedures or recipes how to augment the visual mind will either be disappointed or have already given up. But, considering the last sentence of the section above, gives less reason to believe in existence of this. Therefore it was neither the intention nor the purpose of this essay to deliver a certain amount of formal knowledge or to execute logical arrays, processing given input into formalized output. Instead of this, the attempt has been made to proceed in a way, which resembles an interaction with the visual. There is no start, no In-between, no loop caused by false or idle and no final finding. But there are infinite possible answers, there are hopefully Access-Points to think further and there is confidence. Confidence that interaction is always fuzzy, that interaction needs be fuzzy to be meaningful, because interaction is our only way to gain input, which may become subject of the logical thinking. Only due to interaction distinct outside the box, we can sustain our critical thinking. Only this helps to understand how reasoning works, that reason is just a part of every human's abilities, how reason can become ideology and how ideologies substitute each other. Interaction matters only while doing, then formal knowledge can be transformed into experience, can be forgotten and can become embodied. Then the Inter-Agent can get relieved form formal task and becomes able to pay attention to answers given by feeling, moods and sensation to "how" questions. Interaction cannot be design by an "intelligent designer", by a Super-ordinated authority claiming to be an endless growing function. Only human beings are able to interact meaning fully - because, and not despite of, formal logic.

Computers are only possible due to the existence of human beings using formal logic. Everything that can be done with computers depends on input by human beings processed by logic invented by human beings. Therefore, to consider interfaces between the computer and human beings as imperative logic is just a half of the truth, because imperatives reduce our vision.

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