Controller

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"At the current stage of key development, there will continue to be faulty keys, namely, those that permit me to choose but not to express myself (e.g. the television control panel), [...] but we can expect to be enraptured by all keys at a later stage of automation because they will all be instruments that permit us to join with all others, giving meaning to the whirring chaos of the particulate universe."

This excerpt is taken from *Into the Universe of Technical Images* by Vilém Flusser, first published in German in 1985. Still relevant today, it was translated into English in 2011. This book outlines the history of communication technology as a process of increasing abstraction.

Our digital empowerment began with the remote control. The device first made its domestic entrance in 1956 under the name of *Zenith Space Command*. It was seen as the forerunner of interactive devices; one no longer had to get up to switch the channel. However, I would like to argue that the term *interactive* is not entirely appropriate in this context, since it added a passive layer—of not getting up—to the passive action of watching television. Whereas the user *commands* the *space* on the screen, the concrete space in the backdrop is overlooked.

The release of *Pong* in 1972, an onscreen version of table tennis, marked the appearance of the first successful arcade video game that led to the

popularization of the medium. With arcade games, the joystick, which used the same interactive technology as the remote control, was introduced. The user was for the first time ever able to control a digital self, the *Player*, on the screen.

In 1991, *Pong* experimented with a collective handling of interactive screen motions using a clueless audience in a Las Vegas conference room. Each visitor was given a cardboard wand, red on one side, green on the other side. The audience soon noticed that a camera scanned their movements and displayed their exact location onto a detailed video map of the auditorium hanging on the front stage. When the audience flipped their wands in the air, little dots on the screen went back and forth. Just as the remote control deconstructed the content of television, the joystick demystified the medium: the *pixel*.

Due to the advent of interactive technologies, the user was transformed into a digitized avatar in a virtual dimension. As Vilém Flusser foresaw, giving the ability to choose took away the freedom of expression. Our actions along technological interfaces are governed by remote control, in which our bodily behavior is determined by increasingly complex programs.

What does it mean to be human in post-human conditions?

"Users are disappearing as both phenomena and term, and this development is either unnoticed or accepted as progress — an evolutionary step".(1)

In 2012 Internet artist and theorist Olia Lialina wrote about the growth of invisible computing along with the advent of an invisible user (those who use a system they have not developed). Lialina calls for keeping both the term and the idea of the user alive to protect users and their rights.

By easing up *user interfaces*, users are now able to "write an article in their e-mail client, layout their business card in Excel and shave in front of a webcam". (2) With the help of pre-programmed systems, the user is now able to achieve any of his goals, without the need of having to respect the primary goal of the software or the device. These users are being referred to as *Turing complete users*, empowering a computationally equivalent to Alan Turing's Universal machine. Meaning any problem that can be solved on a Turing machine given a bounded amount of time and memory, can also be solved by the user.

Lialina refers to computer pioneers in order to elaborate on the fact that computers are getting invisible, among them Douglas Engelbart. Engelbart saw the potential of technology in expanding human intelligence, which he called *bootstrapping*, a term referring to the fact that human beings will evolve together with new technology. This vision led him to the invention of the computer mouse (plate 1). In

December, 1968, Engelbart presented *The Mother of All Demos* in which he demonstrated his invention.(3) Nevertheless, the mouse did not become ubiquitous until Apple licensed Engelbart's invention, and the 1984 debut of the Macintosh ushered in the age of personal computing.(4) Engelbart will never receive any royalties, since his patent had ran out.(5) Much of his work helped making computers easier to use. However, it was never his intention to make computers overly user-friendly. Engelbart was mostly interested in turning digital technology into powerful tools.

"It took almost two decades, but the future arrived around five years ago, when clicking mouse buttons ceased to be our main input method and touch and multi-touch technologies hinted at our new emancipation from hardware […] and the advancement of projection technologies erased the visible border between input and output devices. These developments began to turn our interactions with computers into pre-computer actions or, as interface designers prefer to say, natural gestures and movements."(6)

These advancements changed the way we interacted with interfaces; one no longer needed to sit in front of a screen, as the screen turned mobile.

The graphic interface provided by the Macintosh in 1984 granted its users full control by concealing the actual computing – which, in its own way, was controlling the user. The same is currently happening with touch-screen interfaces. When Engelbart

first demonstrated his mouse in 1968, there was no clear idea yet of how people may engage with computers in the future. In 2013, however, Alexander Provan published an essay in *Artforum* on how one might interact with touchscreen interfaces in the upcoming years.(7) The author lays out a world in which interactions with touchscreen interfaces are determined to follow a programmed set of gestures. One should not forget that when Engelbart envisioned his mouse,(8) this too went along with a certain programmed set of gestures. The relative movements of the mouse on the surface are applied to the position of the pointer on the screen, which signals the point where actions of the user take place, so that the pointer replicates the hand movements.(9)

The advent of *multi-touch* technology by the first Apple iPhone made its way into desktop computing, making the mouse, as Engelbart invented it, obsolete. (10) The future instructions chart filed by Apple might be a prelude to 3D interfaces where sensors are monitoring our movements, detaching our fingers from the screen.

Lialina points to the official Apple iPad trailer from 2012 in which the company promotes a "more personal experience with technology than people ever had."(11) The introduction of the iPad created an "illusion of the computerless" in which the interaction with the device is called an experience and the users are being referred to as people, with the primary goal of making one forget that interfaces existed.(12) "With

Experience Design there is only you and your emotions to feel, goals to achieve, tasks to complete. […] Users were for the interfaces. Experiences, they are for the PEOPLE."(13) The use of the word *people* functions as a gentle reminder to software developers that users are human beings who need to be taken into consideration when designing a program. These developers often refer to themselves as *users*, which, in their view, is the best role one could take in relation to its computer. On the other hand, as Lialina argues, "the denial of the word 'user' in favor of 'people' becomes dangerous. Being a user is the last reminder that there is, whether visible or not, a computer, a programmed system you use."(14)

Recently, *The Telegraph* posted an article about the health risks associated to the use of mobile devices.(15) While the article mainly focuses on the new physical posture of the body, it does refer to the notion of changing habits. Up to now, it has always been the user's hand that has been the mediator between the body and the device; whether holding a computer mouse or a telephone, it has always been the hand that has been using it. As shown by a research on the physical posture, it is the whole body that is affected by these developments.(16)

In 2001, another study by Sadie Plant, commissioned by *Motorola*,(17) "identified a variety of behaviors that demonstrate the dramatic impact that cell phones are making as accessories to conduct

life, love and work."(18) The researcher points out that "the fact that our thumbs operate differently from our fingers is one of the main things that defines us as humans. Discovering that the younger generation has taken to using thumbs in a completely different way and is instinctively using it where the rest of us use our index fingers is particularly interesting."(19) This research was conducted in nine city capitals throughout the world; the first changes in the finger use habits caused by mobile technology were revealed observing the ways in which the subjects rang a doorbell.

By turning computer interactions into *natural* gestures and movements, we gain a new understanding to what natural means.(20) For the younger generation, which grew up with these technologies, this is natural. Technology codes our minds; think of the one-year old infant, growing up among touchscreens and print, trying to swipe through a magazine.(21) For the younger generation, who grew up with these technologies, this is natural. Engelbart's thoughts on *bootstrapping* have played out a dark future; the human brain and body have not evolved alongside new technology, but have rather become intertwined with all the consequences new technology entailed.

To this extent, I may conclude that, the user did not disappear, but became a ghost of what we once referred to as user.

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"A cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction. Social reality is lived social relations, our most important political construction, a world changing fiction. (…) Liberation rests on the construction of the consciousness, the imaginative apprehension, of oppression, and so of possibility."(22)

Donna Harraway's thoughts in *Cyborg Manifesto* on what it means to be embodied in a highly advanced technological society reverberate with the idea of the ghost of the user. Although the text is mainly based on an ambiguously gendered creature, this will not be the main focus here. The concept we derive from her book is that of a cyborg as a metaphor for a lived reality in new technology, as the border between the two has become indiscriminate. Haraway emphasizes the human responsibility of breaking down the boundaries of their bodies and the authorization of automatization. (23) Both the cyborg and the ghost of the user are unaware of their being.

In contrast to the *user*, the cyborg is fully aware of the heightened sense of connection to our tools; whereas the *user* no longer controlled its body, due to evolution, a new consciousness has arrived. Haraway argues that "a cyborg world might be about lived social and bodily realities in which people are not afraid of their joint kinship with animals and machines, not afraid of permanently partial identities and contradictory standpoints."(24)

Throughout the discourse of digitized bodies, Kerstin Stakemeier, in *Texte zur Kunst*, writes that artworks "thoroughly aware of the implications of digital media, no longer set these technologies in relation to a reorganization of imageries or paradigms of representation. Instead, digital processes subliminally inform the physical reality of the works. These objects are by no means divorced from the human subject, but their subject-object relation is new: they become symptoms of *disconnectness* of the body in the current crisis of capitalism."(25)

Following the evolutionary stage of both human bodies and digital technology, the first traces of the latter can be found in the etymological theory of *digital:* "The word digital is one that has become very much associated with the modern world. However, it is not a modern word. The OED's entry for digital actually contains evidence for the word as far back as the 15th century with the sense, 'designating a whole number less than ten'. Another early sense referred to the 'digits' (i.e. fingers) of the hand."(26) Hence the digital, often referred to as zeros and ones, finds its background in *pertaining to fingers*.

In *The Informatics of Domination*,(27) Haraway highlights the transition from *reproduction* to *replication*. In this context, replication seems to refer to the ability to copy; something that digitality is capable of through converting information into zeros and ones.

Another approach to look at *digital* is to refer to it as ons and offs. Keeping in mind that Harraway's text was written from a feminist perspective, Aleksandra Domanovic did the exhibition entitled *The Future Was at Her Fingertips* in 2013. The title was borrowed from Sadie Plant,(28) referring to the numerous switchboard operators from the 1930s onwards.(29) These operators were mainly female workers who were specified as *computers;* when switchboards were automated in the 1950s, they—ironically—lost their jobs to computers.

Throughout the exhibition, Domanovic explores the history of technology in former Yugoslavia. Amongst the works, there is a fully rigged model of the *Belgrade Hand*. The prosthetic is known for being the first artificial hand with five fingers in the world and for its automatic control mechanism; as soon as its fingertip comes into contact with an object, it automatically closes (plate 2). Cybernetic prostheses replicate "as much as possible the sensory-motor capabilities of the natural hand. (…) The development of a truly human-like artificial hand is probably the most widely known paradigm of bionics."(30)

In the course of our evolution, there seems to be more and more resemblance between the computer mouse, that is, the pointer that replicates the hand movements, and the cybernetic prosthetic hand.

Apple appears to have picked up this progress as well and created the i-limb (plate 3). Jason Koger lost his both hands when he came in contact with a downed power line. He is the first double amputee in the world

to have received bionic hands that are partly controlled by an iPhone app. "The company claims it offers the closest thing on the market to a real human hand. Unlike most conventional prosthetics, this hand boasts five individually-powered fingers -- including a fully rotatable thumb."(31)

With the app—that is exclusively operative on an iPod Touch or an iPhone5 and up—the user is able to select from 24 different types of grip patterns allowing more functionality. "If you are holding a computer mouse (and) you want to right click, that is a complicated thing with a prosthetic. But this integrated app technology allows a person to do this with ease."(32) Considering what defines us as human beings,(33) Apple has once again shown us its vision of the future that goes far beyond our expectations. As human beings, we *seem* to be in control, yet we are following a programmed set of gestures.

Although the cyborg seems to contrast the discourse of disembodiment, it might well be implicated in it. The ghost of the user and the cyborg are related, as they both have the tendency to delegate our bodies to the scrap heap and make them secondary to machine transcendence.

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"But basically machines were not self-moving, self-designing, autonomous. They could not achieve man's dream, only mock it. They were not man, an author to himself, but only a caricature of that masculinist reproductive dream. To think they were otherwise was paranoid. Now we are not so sure. Late twentieth-century machines have made thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing and externally designed, and many other distinctions that used to apply to organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert."(34)

Although we have seen how human brains and bodies have intertwined with new technology, it is still the human being who activates the motion. If we go back to *The Informatics of Domination*, Haraway points out the transition from *mind* to *artificial intelligence*. (35)

The *Belgrade Hand* starred in the 1977 Hollywood movie *Demon Seed*.(36) Set in the near future, the story revolves around Dr. Alex Harris and his wife Susan. The couple lives in a house that is fully computer automated with Alfred, the Enviromod Security System. His latest project focuses on curing leukemia together with Proteus IV, a computer that has artificial intelligence. After finding the cure, Proteus IV asks when he is going to be released from his 'box', which Alex refuses. Via an open portal, Proteus IV finds its

way into the doctor's house and takes over Alfred, as well as an early prototype robot named Joshua, in the house's laboratory.(37) Proteus IV locks Susan in the house and impregnates her (plate 4). In the context of feminism, this image reverted all that was fought for. In the *Belgrade Hand* series, Aleksandra Domanovic created several prostheses, each containing a gesture or symbol. *Joshua*, 2013, bears images from *Demon Seed*, instigating thus a discourse on feminist politics.

Susan will give birth in less than a month. Proteus IV has prepared an incubator for the baby where it will grow at an accelerated rate and gain Proteus' knowledge. Proteus IV destructs itself after telling the couple that they must leave the baby in the incubator for five days. As they approach, the incubator window opens, revealing a grotesque robot-like being inside. The being's appearance is merely a shell for a human child living within — a clone of Harris' daughter who has recently died of leukemia. The child, speaking with the voice of Proteus IV, says, "I'm alive."

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The talking prosthesis relates back to our handheld devices, our smart phones, as they too, *talk* to us. One should not forget that, when speaking through a phone, our voices get converted to the infamous zeros and ones, in order to transmit the message. Smartphones have become our talismans that offer us access to knowledge, often referred to as *data*.(38) They have become

prosthetic organs for our supernatural selves that extend our mental, physical, and sensual reach.

Mark Leckey seems to agree on the range of thought set out through this text in his curatorial show *The Universal Addressability of Dumb Things*. This exhibition is a conceptual assemblage of unique objects representing an overlap between the virtual and the real world that operates as a network of conversing objects.

> *"This is a Proposal for a Show./That will be populated by Things/That have one foot in this world/And one in another./And its going to toggle between the two./This is a Proposal for a Show./In which I imagine a Newly Born Limb,/The Ghost of a Flea,/And an Endless Note Petrified in Stone./I picture two Prosthetic Arms,/One Ancient/One Modern/ Reaching out as far as they can/To grasp all that there is in the World."*

This excerpt is taken from *Prop4aShw* that Leckey first uploaded to YouTube in 2010.(39) In the video, he speculates on a future exhibition that is to become *The Universal Addressability of Dumb Things*. In an interview with Lauren Cornell, Leckey explains: "The more computed our environment becomes, the further back it returns us to our primitive past, boomerangs us right back to an animistic world view where everything has a spirit, rocks and lions and men. So all the objects

in the world become more responsive, things that were once regarded as dumb become addressable, and that universal addressability—a network of things—creates this enchanted landscape."(40)

By using 3D printing technology, Leckey creates solid versions of existing objects; objects that, through scanning, become digital information, which, in turn, produces new objects referred to as *dupes*.(41)

In his show, an original thirteenth century silver hand reliquary finds its place (plate 5), next to a bionic hand, *conversing*. "As visitors listen in on this conversation of hands, we are quick to learn that the relationship between them is by no means limited to a story of formal complementarity."(42) The *boomerang* Leckey speaks of can be found in the Bluetooth transmitter of the prosthesis; the silver hand contains the bones of a saint, which the Catholic Church calls *speaking reliquaries*, because the bones that they contain *speak*.(43) Everything is connected to a network.

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Digitality's ability to copy and process made it into media. By not going too deep into the discussion on what media are, I want to point out that, when establishing a framework within which to understand media, Marshall McLuhan—famously—noted that the content of every medium is yet another medium.(44) To identify content originating from real life objects

and processes, one only needs to examine the graphic interfaces of computer operating systems; the *desktop*, *folder*, and *file* digitize icons from contemporary office culture.

Whether it is a *replication* of the hand performed by the pointer of the computer mouse or the prosthetic, it all takes place in the same network of *simulation*. With our bodies and consciousness being digitized, we become a *dupe* of digital data that may be thought of as the leftovers of materiality. It is the digital memory that reminds us of who we are in a concrete space. In this space, we find bones of the saints that were embellished in silver and whatever material i-products are made from. To be connected to a heavenly realm beyond life, they are reanimated through technology.

The day when a Proteus IV-like machine will want to explore reality outside the box is yet to come. Think about the biological terms we use in computing —e.g., worm, virus—that seem to be describing living organisms.

It was Mary who *had* a little lamb; whatever happened to that lamb is up to date unknown. If Mary *simulates* the development of digital technologies, that little lamb simulates our future. It was Mary who *helped* the little lamb; whatever is going to happen to us is up to date unknown.

It all seems to fall into place during the process of evolution.

Notes

1. Lialina, Olia. "Turing Complete User". *Contemporary Home Computing.* 14 October 2012. 01 January 2015 <http://contemporary-home-computing.org/turing-complete-user/>.

2. Lialina 2012.

3. SRI International "Part 4 of 10: Engelbart and the dawn of interactive computing: SRI's 1968 Demo (Highlights)". *YouTube.* 11 December 2008. 01 January 2015 <https://www.youtube.com/watch?v=hRYnloqYKGY>.

4. Provan Alexander. "Gestural abstractions". *Artforum International.* Vol. 51, No. 7 (March 2013): 127-128.

5. Sydell Laura. "Douglas Engelbart dies at 88, invented computer mouse". *NPR.* 04 July 2013. 01 January 2015 < http://www.npr.org/2013/07/04/198596207/douglas-engelbart-dies-at-88-invented-computer-mouse>.

6. Lialina 2012.

7. Provan 2013.

8. Next to the original handheld device as we know it, experiments were done with knee apparatus, a joystick and a light pen.

9. The cursor on the screen is being referred to as *cat.*

10. Multi-touch refers to the ability of a surface (a trackpad or touchscreen) to recognize the presence of more than one points of contact with the surface.

11. Apple Inc, "Official Apple (New) iPad trailer". *YouTube.* 07 March 2012. 01 January 2015 < https://www.youtube.com/watch?v=RQieoqCLWDo>.

12. Lialina 2012.

13. Lialina 2012.

14. Lialina 2012.

15. "The forward-leaning posture that many people adopt when texting, going online, sending emails or playing games on phones and other mobile devices increases the risk of an early death in elderly people, and there are fears that younger people could also be knocking time off their lives." Curtis Sophie. "Texting for long periods could lower life expectancy". *Telegraph*. 25 March 2014. 01 January 2015 < http://www.telegraph.co.uk/technology/mobile-phones/10721014/Texting-for-long-periods-could-lower-life-expectancy.html>.

16. Earlier research already showed the side effects of using a computer mouse, that is, repetitive strain injury (RSI). Hanson M et al. *Epidemiological and ergonomic study of occupational factors associated with syndromes of upper limb disorders in keyboard operators*, Institue for Occupational Medicine, Edinburgh: IOM, 1999.

17. Plant Sadie. "*On the Mobile: The effects of mobile telephones on social and individual life*. Schaumberg: *Motorola*, 2001.

18. Armitage John. "Sadie Plant: From the stone age to the phone age." *Nettime*. 08 November 2001. 01 January 2015 < http://www.nettime.org/Lists-Archives/nettime-l-0111/msg00048.html>.

19. Hill Amelia. "Thumbs are the new fingers for the GameBoy generation". *The Guardian*. 24 March 2002. 01 January 2015 < http://www.theguardian.com/uk/2002/mar/24/mobilephones.games>.

20. Adjective 1. Existing in or derived from nature; not made or caused by humankind:

21. UserExperiencesWorks "A Magazine Is an iPad That Does Not Work.m4v". *YouTube*. 06 October 2012. 01 January 2015 <https://www.youtube.com/watch?v=aXV-yaFmQNk>.

22. Haraway Donna. "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century". *Simians, Cyborgs, and Women: The Reinvention of Nature*, New York: Routledge, 1999.

23. See note 15.

24. Harraway 1999.

25. Stakemeier Kerstin. "Prosthetic Productions. The Art of Digital Bodies, On "Speculations on Anonymous Materials" at Fridericianum." *Texte Zur Kunst.* Nr. 93 (March 2014): 166-181.

26. Holden Richard. "Word trends: digital". *Oxford Dictionaries Blog.* 06 March 2012. 01 January 2015 < http://blog.oxforddictionaries. com/2012/03/word-trends-digital/>.

27. A chapter in which she presents a chart that reveals transitions of a natural past.

28. Plant Sadie, *Zeroes and Ones: Digital Women and the New Technoculture*, New York: Doubleday, 1997.

29. In the early days of telephony, companies used manual telephone switchboards and switchboard operators who connected calls by inserting a pair of phone plugs into the appropriate jacks.

30. Carrozza Maria Chiara et al. *The Cyberhand: on the design of a cybernetic prosthetic hand intended to be interfaced to the peripheral nervous system.* Las Vegas: IROS, 2003.

31. Dellorto Danielle. "Bionic hands controlled by iPhone app". *CNN.* 12 April 2013. 01 January 2015 < http://edition.cnn. com/2013/04/12/health/bionic-hands/>.

32. Dellorto 2013.

33. "The fact that our thumbs operate differently from our

fingers is one of the main things that defines us as humans." Armitage 2001.

34. Harraway 1999.

35. A selection of other transitions presented in this chapter: from *representation* to *simulation*, and from *labor* to *robotics*.

36. Cammell Donald. *Demon Seed*. Metro-Goldwyn-Mayer. 1977.

37. As *played* by the *Belgrade hand*, attached to a limb and a wheelchair. Also see Plate 4. Note that Joshua is left handed, as they used the original prosthesis for the shooting.

38. Data is here indicated as digital information, in this sense, our voices also become data.

39. Mark Leckey. "Prop4aShw". *YouTube,* 01 June 2013. 21 April 2015

< https://www.youtube.com/watch?v=v5XCscECpAo>.

40. Cornell Lauren. "Techno-Animism". *Mousse Magazine.* Nr. 37 (February 2013).

41. Also Domanovic uses this technique for her Belgrade hand series, also note that actual functioning printed prostheses are on the market since 2012.

42. Hawkins Sophie. "Talking Hands, or the Return of the Relic". *The New Everyday.* 01 October 2013. 01 January 2015 < http://mediacommons.futureofthebook.org/tne/pieces/talking-hands-or-return-relic>.

43. Taken from an interview with Dazed & Confused, in which Leckey explains the history of the silver hand. Ying-Wong Flora. "Mark Leckey's 5 dumbest things". *Dazed Digital.* 05 March 2013. 01 January 2015 < http://www.dazeddigital.com/artsandculture/article/15557/1/mark-leckeys-5-dumbest-things>.

44. McLuhan Marshall. "The Medium is the Message". *Understanding Media. The extensions of man*. Chippenham: Routledge, 1964.

Plate 1. A prototype of the first computer mouse, hold by Engelbart himself, invented in 1964. *Getty Images*, 2012.

Plate 2. The Belgrade Hand by Rajko Tomovic. 'Early robotic prosthetic hand, made in 1963. On open public display at the main shopping mall in Belgrade.' *Commons Wikimedia.* 2012.

Plate 3. Still from 'I-Limb: Hands Controlled by an App', *CNN*, 12 April 2013, 00:52m.

Plate 4. Still from *Demon Seed*, taken from Metro-Goldwyn-Mayer Inc. review paper, 1979.

Plate 5. 13th Century silver hand reliquary. Courtesy of Victoria & Albert Museum, London. 2014.

Controller
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