REFLECTING ON NEURALINK: WHAT IS THE POSSIBLE ROLE FOR EASTERN PHILOSOPHY TO PLAY IN EMERGING TECHNOLOGIES?

Diah Febri Utami
Department of Philosophy, Vienna University
Email: Utamid90@univie.ac.at

Abstract: From COMPASS, which helps investigators identify suspects more rapidly, to Tesla S with its sophisticated self-driving car, artificial intelligence is deeply rooted in secular ideals of progress. AI not only automate many routine tasks; limits that constitute what it means to be human are attempted to be erased. For instance, Neuralink enables telepathic to some degree, able to converse without speaking or words but by access to each other's thoughts at a conceptual level. While machine learning is prevalent, the defenders of different ethical traditions weigh in for a higher technology adjustment. 'Bio-conservatives,' for example, denounce Neuralink's project as a moral transgression; meanwhile others consider the jeopardy of technological liberalism that is deeply related to instrumental reason and responsibility. In the paper, I will discuss further some potential ethical issues surrounding Neuralink. Instead of underlining the pit of trouble, I'll offer the Eastern perspective with the Theravada theory of mind as an alternative knowledge for the concept of technology of Neuralink. Beyond the bunch of ideas of mind from Eastern Philosophy, Theravada goes a step further since it's used heuristically in artificial neural networks. Taking the Eastern ontological approach should give benefit the development of technology. Foremost, it offers alternative epistemologies and epistemes in the concept of technology as a response to the crisis of the Anthropocene. The approach minimizes some ethical concerns in emerging technology, notably when the impact relates to decreasing human 'value' and avoiding the utopias of collective responsibility.

Keywords: Neuralink, responsibility, telepathy, Theravada

Abstrak: COMPASS si mesin penyelidik yang dapat mengidentifikasi tersangka dengan lebih cepat, maupun Tesla S si mobil tanpa awak, ide kecerdasan buatan berakar pada cita-cita kemajuansekuler. AI tidak hanya mengotomatiskan tugas rutin; batas-batas yang membentuk 'apa artinya menjadi manusia' perlahan mulai ditepis. Neuralink, misalnya, tidak hanya berguna untuk membantu penderita neurodegeneratif; kemampuan si chip diperediksi dapat memungkinkan telepati tingkat konseptual, yaitu komunikasi non-verbal alias hanya dengan akses pikiran. Sementara mesin pintar makin laju, para pembela etika tradisi menimbang penyesuaian. 'Bio-konservatif,' mencela proyek Neuralink sebagai pelanggaran moral, sedangkan kritikus lainnya mengingatkan bahaya liberalis meteknologi yang sangat terkait dengan nalar dan tanggung jawab instrumental. Dalam makalah ini, beberapa isu etika potensial seputar Neuralink dibahas lebih mendalam. Alih-alih menggarisbawahi masalah, perspektif Timur melalui teori pikiran Theravada akan dihadirkan sebagai pengetahuan alternatif konsep teknologi Neuralink. Diantara sekumpulan teori pikiran dari Filsafat Timur, Theravada melangkah lebih jauh karena digunakan secara heuristik dalam replika otak. Pendekatan ontologis Timur memberi manfaat bagi perkembangan teknologi. Pendekatan Timur menawarkan epistemologi alternatif dalam konsep teknologi sebagai respon terhadap krisis Antroposen. Utopia tanggung jawab kolektif serta degradasi ‘nilai’ manusia dapat diminimalisir melalui pengaplikasian pendekatan tersebut dalam konsep hubungan teknologi dan manusia.

Kata kunci: Neuralink, tanggung-jawab, telepati, Theravada

1. INTRODUCTION

There is an exciting dystopian series by BBCtitled *Years by Years*. The story was set in 2019,but the drama is about predictions in 15 years ahead. In the second episode, the show features Bethany, an 18 years girl who had cybernetic implant surgery. She shows her mother how she could simultaneously be a human and a cellphone with all its equipment. Bethany lookshappy, while her mother seems scared.

Humans are never satisfied; apparently, so does the transhuman. Bethany wants to be more than a human-cell phone. In another episode, shedid a brain implant that enabled her to interact directly with the internet. In effect, the chipcould track activity in the neural pathway and micro-movements in the retina to picture what she was thinking. Not only hers, but the device enables Bethany to surfer others' thoughts, such as predict their desire or even their talents. Morein this episode, she begins to mourn the reality that she is still a human being. She wants to remove her body parts and ultimately be data. Unfortunately, Bethany doesn't have Cinderella's destiny. She has to remain atranshuman with her human skin.

In reality, Bethany's wish is in line with the Neuralink company which develops implantable brain-machine interfaces (BMIs). The aim of this technology is noble: to help people with severe brain and spinal cord injuries, such as neurodegenerative disorders or neurobiological shortfalls (Fiani et al., 2021). Instead of speaking or doing other motoric movements, the chip operates their phones and computer directly withtheir brains (Kennedy, 2021). Elon Musk, the investor of the product, argues that BMI holds promise for restoring sensory function and treating neurological disorders. BMI for clinical treatment thus should be widely expanded, for the current modest channel counts have limited their potential (Musk and Neuralink, 2019).

The demand does surely not stop at this point. A new report by the Royal Society outlines that people could become telepathic to some degree, able to converse without speaking or words but by access to each other's thoughts at a conceptual level. Instead of reading my-self brain, the device is expected to transmit thoughts from one person to another (Cuthbertson, 2019).The monkey 'mind pong' is a picture ofNeuralink success. As its name, the monkey named Pagar was playing the video game Pong with its mind after signals were sent wirelessly via an implanted device. During the game, the Neuralink device recorded the information aboutwhich neurons were firing to control which movements (Wakefield, 2021).

Though it sounds fascinating, this new technology plainly raises some ethical concerns. If implantable chips take control of specific decision processes and even enable them to read others' thoughts, is that person still themselves or already a part of the machine? Others argue that this device could pose an existential threat to societies as it sharpens the idea of human perfectibility. 'Bio-conservatives' denounce Neuralink's project as a moral transgression because different essential limits would be erased; limits that constitute what it means to be human (Fourneretis, 2022). Those notes are in line with Arendt's critique regarding technological developments. Some implications of technology include automatizing labor and speech, while human life is stripped of meaning and reduced to an automatized (Lozanoska, 2020). Coeckelbergh pictures it in the same tone: "*If a machine can do this, what is left for us? What are we?*" (Coeckelbergh, 2020, p.2).

One can also uncover the hidden gem of Neuralink through Musk's statements. Firstly, Musk doesn't impose this intelligent device on anyone. Everyone makes their own decisions, and if some individuals wish to receive a brain implant, no one should discourage or stop them because this would constrain individual beliefs and values (Fourneretis, 2022). Economic freedom might be the principle of that expression: everybody has the right to own property and to use it as they see fit so long as they do not use it to cause harm to others. But it might be dangerous since everyone has sovereign control over their body. A consequence question: who should bear moral responsibility if the individual's responsibility is anchored in individual rights? Seemingly, it doesn't only reveal the jeopardy of technological liberalism. Its derivation, such as responsibility, should be a concern since this neurotechnology permits limitless access to one's private matter.

In this paper, I will further discuss some

potential ethical issues surrounding the chip and direct it to the discussion of responsibility in innovation. But instead of underlining the pit of trouble, I'll offer Theravada's theory of mind as a pearl of wisdom from Eastern Philosophy and as an alternative knowledge for the concept of technology of Neuralink. As we shall see, Theravada, with its method, opens the possibility of telepathy. As we have briefly seen, the ability to telepathy is one of the significant purposes of the device. Taking the Eastern ontological approach should give benefit the development of technology. Foremost, it offers alternative epistemologies and epistemes in the concept of technology as a response to the crisis of the Anthropocene. When the approach is possible to apply, some ethical concerns in the emerging technology, notably when the impact reduces human 'value,' can be minimized. But if it sounds impossible, I would underline what the etymology of 'technic' could mean (see: Simondon, 2015 or Merriam-Webster Dictionary): isn't technic not only material things that we usually associate with technology, but also about techniques (to play with those material things), right?

2. METHOD

I use qualitative explanatory case studies for the method. As Baxter and Jack argue (2008), the methodology provides tools for researchers to study complex phenomena within theircontexts. When applied correctly, it becomes a valuable method for developing theory or interventions and evaluating programs.

Further, Baxter and Jack note eight steps to conduct a qualitative explanatory case study:

1) Establish a broad case to investigate.
One of the main questions in this step is, 'is too much information already available for the case?' There is an amount of research regarding Neuralink from the medical side. However, papers regarding its ethical concern or an offer for the episteme side, especially using Eastern Philosophy for solving those matters, is still paltry.

2) Establish the research question(s)
A research statement is essential to guide investigations. As Baxter and Jack underline, it can be conditional or non-conditional, directional or non-directional, or expressed as a null hypothesis. As in its title, the primary research question is, 'reflecting on Neuralink, what is the possible role for Eastern Philosophy to play in emerging technologies?' A sub-step in this phase is an extensive literature review to find what others have done in this area.

3) Select the precise case(s) to be used
Precise case(s) can be single or multiple cases. "*When using multiple cases, you need to treat each case as a single case*" (ibid, p. 4). I use multiple cases (Theravada and the ethical concerns in Neuralink) to devote a chapter or section to each case. The conclusions from each part are continually used as information contributing to the whole study. However, each case should remain separate in the treatment**.**

4) Determine data gathering and analysis techniques
Exemplary case studies use several different research tools to increase validity. One can use qualitative and qualitative approaches and other data collection instruments (in this case, I use documentation review). This step aims to "triangulate" techniques to provide different views of the case.

5) Prepare to collect the data
I use a method of categorizing data for measuring, including preparing formats for narrative reporting and revising the research design after review.

6) Collect the data
For this point, the data is collected by systematic evidence, or the data from various sources contribute to the overall aims of the study.

7) Analyse the data
As Baxter and Jack points out, data is used to find relationships between the object of study and the research questions posed in case study research. For this purpose, I did tabulate information to made checking easier, corroborated and supported the qualitative data obtained, and vice-versa, and investigated the patterns in the data.

8) Prepare the report
I used the standard empirical report style is usually modified to make it clear how the data from different sources answer or illuminate the research question. I refer to the research questions(s) with quotations or other qualitative evidence. The report also includes evidence from published literature in the discussion section that confirms and disconfirms the data collected.

3. RESULTS AND DISCUSSIONS

3.1 Getting Acquainted with Neuralink andits First Hindrance

Neuralink is a brain-machine gadget to connect humans and computers. Neurosurgeons surgically implant a chipset called 'the link' into the skull using robotics. The link has several insulated wires connected to the electrodes used in the process. This device can operate smartphones and computers without touching them (Kennedy, 2021).

Electrodes play an essential role in Neuralink. In fact, the human brain already has a bunch of electrodes. In Musk's vision, this natural creation will merge with artificial electrodes (Regalado, 2017). In its trial, researchers have demonstrated human neuroprosthetic control of computer cursors by using no more than 256 electrodes (Anumanchipalli et al., 2019). Although it suggests that high-fidelity information transfer between brains and machines is possible, the development of the brain-machine interface has been critically limited by the inability to record from large numbers of neurons (Pesaran et al, 2018).

There are two common technics in the BMI approach. According to Pesaran et al., (ibid) noninvasive approaches record the average of millions of neurons through the skull, however the recorded signal is highly distorted and nonspecific. The other one is the invasive technique, which is most used in the BMI. This technique provides the most precise readout of neural representations and requires recording single action potentials from neurons in distributed, functionally linked ensembles (Yuste, 2015). Invasive electrodes placed on the surface of the cortex can record valuable signals. Still, they are limited in that they average the activity of thousands of neurons and cannot record signals deep in the brain (Kaiju et al., 2017).

Another alternative approach is to use thin, flexible multielectrode polymer probes (Chung, 2019). Microelectrodes are the gold-standard technology for recording action potentials, but there is no clinically translatable microelectrode technology for large-scale recordings. The smaller size and increased flexibility of these probes should offer excellent biocompatibility. However, a drawback of this approach is that thin polymer probes are not stiff enough to insert into the brain directly; their insertion must be facilitated by stiffeners (Hong et al., 2019). Meanwhile, Neuralink develops functional requirements for a high-bandwidth brain-machine interface while taking advantage of the properties of thin-film devices. The robotic approach is created by inserting several fines and flexible polymer probes efficiently and independently across multiple brain regions (Timothy, 2019).

The observation runs not without any scars. Regalado (2017), as a senior editor for biomedicine for MIT Technology Review, strongly notes that Neuralink's mission will not happen. His criticism doesn't only address Neuralink. Facebook, in 2017 claims that "*inside of two years, the social network will have a skullcap able to transmit sentences out of your brain at a rate of 100 words per minute*" (ibid). In Facebook's case, the skullcap would help you to "share" your thoughts. Think about how Google fills in suggestions on what one is looking for. Musk proposes that the same thing should occur in real-time inside your head. The achievements of brain implants will be challenging to attain, and the timelines are not only wrong—they're pure malarkey. For instance, Krishna Shenoy and his team from Standford University need a decade to set a brain-typing record of 8 words a minute. "*The electrodes are used to record activity from a few dozen neurons, and you can start to perceive the movement as a subject thinks*" (ibid).

The quandary of the Neuralink mission is the time targeted by the principal investor itself. Musk in Regalado (ibid) says that within eight to 10 years [the promise was started in 2017], healthy people could get brain implants as new computer interfaces. Let's scrutinize this timetable immensely. A brain implant is a medical need that requires neurosurgery. To prove that it works requires a stepwise series of experiments that each takes years, starting in rats to monkeys. For comparison, a company called NeuroPace was formed in 1997 to develop an implant that controls epileptic seizures. It senses a seizure coming and zaps your brain to stop it. The device got approved in 2013—16 years later. And that was for a severe medical condition in which brain surgery is common (ibid).

Then what if the implant is for healthy

people? It would require extraordinary evidence of safety. And that's hard to imagine because as soon as you open someone's head, you risk that person's life. Technology and science need to record safely inside the skull simultaneously, including its neural lace, neural duce, and optical arrays. Though the methods and approaches mentioned previously seem qualified, they remain mainly in the blueprint phase. Letting people accurately think to text as fast as they talk might be possible, but only with some significant advances that might not be like Musk's schedule wish.

3.2 The Next Door: Theravada as an Alternative

A bunch of technomedicine theories are presented. Let us leave for a while Neuralink debates and the puzzle of why Musk is promising within a few short years of public telepathy. Is that just a brain-machine interface as a single entry to enable telepathy via Neuralink? Theravada's theory of mind could be a choice.

Meditation and concentration are vital elements in Theravada beliefs (BBC, 2002). They are such a way for awakening (or enlightenment); self-liberation through one's own efforts. As is written, 'one's own effort' means there is neither supernatural power nor God who gives solutions to the problem of human beings. Each being has to make its own way to enlightenment. According to BBC, the follower is expected to "abstain from all kinds of evil and purify their mind" under 'five Precepts,' such as refraining from harming living beings and not taking what is not freely given.

Meanwhile, meditation needs a prescribed. Wisdom is such a key to unlocking meditation. Wisdom is inconceivable for a person who does not meditate. In other words, meditation is improbable for a person who lacks wisdom. Although these principles are accepted in the authoritative scriptures, non-Buddhists should understand that they do not contain absolute truths that followers take as a matter of faith. As asserted above, it should be 'one's own effort' or tools that individuals try to use in their own lives. Though there is no (or not yet) empirical evidence for telepathy as described in popular culture, people who practice Theravada may experience what are generally calls as 'psychic' abilities. Empiric research provided by Harvard Medical School tested some monks, including Matthieu Ricard (Gayantha, 2012), a geneticist (and a monk), who discovered brain gamma waves that linked to consciousness, attention, learning, and memory (Nuwer, 2012). The research found that these monks' sensory abilities and observational capacity, especially in microexpressions, are much higher than ordinary people's (Gayantha, 2012). Gayantha notes, the usual maximum for gifted spies specifically trained by the CIA is 30–50%, and the monks are 80-90%. This rate lets monks know what another person is thinking or what is happening in distant places (ibid).

Out of the scope of ontology, an offer Theravada theory of mind as a theoretical basis for a technology product is not something new. There is a proposal by Karunananda (2002), who uses the theory in designing and training Artificial Neural Networks. In short, an Artificial Neural Network is defined as a simple analogy to the human brain (ibid). According to Karunananda, there is no underlying theory for designing neural networks, such as determining the appropriate number of neurons in the input layer or selecting the initial weight matrix. The design and training of neural networks are merely based on heuristic decisions. One of the primary heuristics used is that "*the number of neurons in the input layer can be determined as the number of components required to represent an input*" (ibid).

Karunananda proposes how the thought process in Theravada's principle can bolster the heuristic used. Implicitly stated, the mind operates as a sequence of conditional thoughts flow. Briefly, the mind behaves concerning a given input. Once an input has entered the thought flow, a line of thought will form several thought processes before accepting the following input (ibid). In other words, the thought flow reaches respective limiting states due to each input.

He incorporates those principles into the design of the neurons layer as in the heuristic proposition to predict the behavior of the human mind modeled by a neural network. Further, Theravada sustains the major heuristic used in Artificial Neural Network. Selecting and calculating the number of components of an input similar to the number of neurons in the input layer has a theoretical justification from Buddhism. ”*Input cannot enter the thought flow immediately without adjusting the mind*” (ibid). This principle is similar to changing weights

matrix, which represents the probability of events over emotions. The idea of terminating a training session has a meaning to the concept of limiting the state of a thought process.

3.3 Reaching the Problem Solving

It's easy to predict that the primary idea to reduce the ethical dilemma of telepathy via Neuralink is by controlling our own minds first before the chip is implanted in the brain. For clarity's sake, meditation in Theravada's rule enables people to have psychic abilities, as reported by Harvard. However, it can only be achieved by people who have wisdom, abstain from all kinds of evil, and purify their minds. Then how might this abstract proposal narrow ethical matters in Neuralink?

Firstly, it matters to question what is the innovator's motif behind the telepathy idea thru the chip; whether it's just to make easier for people to communicate without spoken words, or so that others can better understand one's mental state, or probably to exchange gossip inter-brains. The grounds strongly link not only to how its design should be but also to the instrumental reasons and the maximum affordances. As stated previously, Musk apparently endorses technological liberalism behind Neuralink. Consequently, all the possible limits should be allowed since intellectual freedom, such as the right to develop one's ideas should also be respected; whether a person uses the device for surveillance under the pretext of curiosity, or pursuing human perfectibility behind a sophisticated neuro device. If through value rationale, one should assess the ultimate ground of 'why' an individual does a thing, then it seems pretty hard to answer with that liberalism schema. Again, nobody can claim to know what is best for someone else because everyone has sovereign control over their own body.

If the sky is the limit for the instrumental values, then it brings difficulties in the scope of responsibility, especially when considering Neuralink as a product. Responsible innovation in emerging technology often needs collective responsibility because there is no single hand in creation. In fact, realizing full collective responsibility is an arduous challenge. Blok and Lemmens (2015) underline that responsible innovation, especially when it takes collectively, is problematic due to the epistemological approach to putting it into practice. Let us imagine the role of doctors and programmers in Neuralink since this product is as neurotechnology categorized. Both doctors and programmers respectively have their tenets, interest, or even their own intention for a product. Suppose the chip's speed should be enhanced because its investor desires a higher capability, for example, but at the same time this enhancement damages neurons, and it goes against the tenets of physicians; then how should collective responsibility be laid out? Thus, identifying collectives that genuinely have collective responsibility is a difficult task, primarily because of the interest contradiction or even the different perspectives or how they articulated the moral responsibility.

Moreover, innovation, by virtue of being a process that brings novelty into the world, generates a ‘responsibility gap.’ Our institutions rely on legal regulation; they lean very much on backward-looking responsibility since it’s hard to regulate what hasn’t happened yet. Innovators are, therefore, often a few steps ahead of regulators. According to Reijers (2022), it means that to do responsible innovation well, it needs more than compliance with existing rules. Innovators are, therefore, often a few steps ahead of regulators. This means that to do responsible innovation well, it needs more than compliance with existing rules. Innovators need to look ahead and anticipate what their inventions might do.

Instead of just becoming a utopia, the concept of responsibility should bear in 'me' than 'we.' In other words, the actor or the individual must bear the major responsibility. Theravada, with its method, could prepare a person to be more responsible. Assuming that psychic ability is enabled by meditation and to achieve meditation requires wisdom and abstaining from all kinds of evil and purifying minds as stated previously, it seems like a driving test for someone who wishes for a motorbike. The vehicle remains as an instrument rather than an end; the driver can still arrive at the destination by walking, but the motorbike would speed up the time without changing the goal. Relating to the previous issue regarding instrumental rationality amidst technological liberalism, the Theravada theory of mind gives an optimist answer to such a question: "why am I doing telepathy through Neuralink." At least there are

precepts that one should obey and do before achieving psychic abilities, so that some worries such as misusing the device could potentially be minimized. Preparing ourselves as 'a wisepeople' before implementing the chip in our brain sounds much better than only implementing the device because we are able to buy it.

Putting full responsibility on the user might lead to a discussion regarding the moral status of Artificial Intelligence in general. Coeckelbergh (2002) mentions at least two moral standing of AI, i.e., AI as a moral agency and a moral patiency. in short, moral agency concerns questions about the ethics of AI; it considers AI a potential ethical agent. Conversely, moral patiency regards AI as an object of ethical concern. Its question is surrounding: does AI deserve some form of moral consideration?

If responsibility totally belongs to human beings, it means that all moral reasons and autonomous decision-making should only hand by humans; the opportunity of AI as a moral agency could be significantly diminished. It is not merely that morality is entirely a matter of human emotions. Though the defenders of AI as a moral agency endorse the concept of functional morality by Wallach and Allen, in regards to Neuralink, the defenders might be challenged by questions such as: can Neuralink assess moral challenges from a mental state? (Emotion recognition so far can read 'merely' by human expressions, gestures, text, and voice tone; while Neuralink wishes to access other's mental states by the human mind).

Furthermore, making users the main responsible might give a win-win solution both for humans and AI. Without letting Sherry Turkle worry regarding the anthropomorphism of AI, treating AI morally gives benefits to humans and the machine itself. For example, several teenagers nowadays experience Kübler-Ross Model, especially when its problem is about smartphones (cf., Burnett, 2014). It started from the denial phase, such as 'why did myphone break? It couldn't be broken!' till anger phase such as 'my phone broken wasn't fair!' (ibid). AI contributes to those emotions because (un)consciously human hands over many tasks to them; as if AI is more than a tool in the people-technology relationship. It might slightly sound like Kantian, but 'respecting' AI as a tool in the sense that humans do not overuse an AI, hopefully can make AI not a scapegoat for the inability of humans who cannot control their desires. And if humans are more responsible for AIs, especially in the handover of tasks, perhaps it could be a sign that humans are stillfunctioning themselves as humans.

This proposal touches slightly on the discussion of postmodernism. In the minimum sense, postmodernism questions the boundaries between human and non-human and also uses cultural background rather than naturalist understanding. With this spirit, let me interpret interesting sentences from Stiegler (1998) literally: "*.... humans are not simply creatures that happen to make and use technologies. Much more than that, humans are technological beings in their very essence. In other words, a human being stripped of technology is barely a human any longer*". How if the words 'humans are technological beings in their very essence' is interpreted as 'not only as the tool users, but humans innately also have power sources, which might be more-less compatible with techs?' It was probably a naked argument or even just my imagination. But if the idea of AI itself is to help humans from a dirty, dangerous, and dull things, then why do we have to deal with the potential dangers of AIs themselves?

4. SUMMARY

An emerging technology denotes a way of thinking and arguing about a set of technics (things, but also techniques and practices) that are about to or in the process of profoundly changing who we are. Hopefully, the idea of Theravada as an alternative knowledge to the concept of Neuralink wouldn't be seen only as the voice of an Asian perspective in thediscourse of human-technology relationships. More than that, if a sophisticated device like Neuralink is already predicted to bequeath ethical dilemmas, why should it be developed with a commonly used approach? As proposed, Theravada could mitigate ethical concerns in the human-technology relationship, mainly when the scope is of collective responsibility. At the same point, Theravada responds to innovation dilemma regarding how to make sure that standards of products are always in line with an idea of what it means to be a good person who leads a good life. We do not have to step back from this Silicon Age; Theravada, thru its principles, provides an alternative way to go side by side with emerging technology, especially with the idea of Neuralink.

This proposal is much more about the ethical aspect. However, the paper regarding ethical discussion of Neuralink is still deficient (could be seen in the reference). Another topic such as in the last paragraph of the discussion section, i.e., postmodernism, the moral status of robots or AI, or perhaps transhumans could be developed further. This is the prime time to intertwine it with the technological side since there are 'many hands' to pursue a responsible innovation. In other words, if emerging technologies always deal with the 'before' and 'after' a new way of life that technology could bring, then hopefully, technocrats, philosophers of technology, or other stakeholders would choose a surprising door rather than hold the trouble ones. As Socrates said: "before we can surmount or circumvent impasse, we need to examine the intellectual failure that led us to it" (Migotti and Wyatt, 2017).

5. ACKNOWLEDGEMENT

I sincerely thank Dr. Wessel Reijers. This paper is an outcome of the seminar on ethics and philosophy in emerging technology at Vienna University during Summer Semester 2022. Without the course and Dr. Wessel Reijers' contribution and comments on an earlier versionof this manuscript, this paper would be much lessinadequate.

6. REFERENCES

Anumanchipalli K., Chartier J., Chang EF. (2019). *Speech synthesis from neural decoding of spoken sentences*. Nature. Pp. 493-498. doi: 10.1038/s41586-019-1119-1.

Baxter, P., & Jack, S. (2008). *Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers*. The Qualitative Report, *13*(4),544-559. https://doi.org/10.46743/2160-3715/2008.1573

BBC. (2002). Theravada Buddhism. [Online] Available at: *https://www.bbc.co.uk/religion/religions/buddhism/subdivisions/theravada_1.shtml*. [Accessed: 7 Mei 2022].

Blok, V., Pieter, L. (2015). *The Emerging Concept of Responsible Innovation. Three Reasons Why It Is Questionable and Calls for a Radical Transformation of the Concept of Innovation*. Responsible Innovation 2: Concepts, Approaches, and Applications, edited by B. J. Koops, I. Oosterlaken, H. Romijn, T. Swierstra, and J. van den Hoven. Heidelberg: Springer. Pp. 1–303. DOI:10.1007/978-3-319-17308- 5_2.

Burnett, D. (2014, December 22). Losing Your Smartphone: The Five Stages of Grief. TheGuardian. [Online] Available at: *https://www.theguardian.com/science/brai n-flapping/2014/dec/22/phone-smartphone-loss-damage-grief*. [Accessed:25 June 2022].

Chung E., Joo R., Fan L., Liu F., Barnett H., Chen S., Geaghan-Breiner C., Karlsson P., Karlsson M., Lee Y., Liang H., Magland F., Pebbles A., Tooker C., Greengard F., Tolosa M., Frank M. (2019). *High-Density, Long-Lasting, and Multi-region Electrophysiological Recordings Using Polymer Electrode Arrays*. Neuron. Pp. 21- 31.e5. doi: 10.1016/j.neuron.2018.11.002.

Coeckelbergh, Mark. (2020). *AI Ethics*. MIT Press. Massachusetts.

Cuthbertson, A. (2019, September 10). *Brain-computer Interface Will Make People Telepathic, Scientists Say*. Independent. [Online] Available at: https://www.independent.co.uk/tech/brain- computer-interface-neuralink-elon-musk- telepathy-a9097821.html. [Accessed: *25 June 2022*].

Fiani B, Reardon T, Ayres B, Cline D, Sitto SR. (2021). *An Examination of Prospective Uses and Future Directions of Neuralink: The Brain-Machine Interface*. Cureus. doi: 10.7759/cureus.14192. PMID: 33936901; PMCID: PMC8083990.

Fourneretis, E. (2022, April, 1). *The Dangers ofMusk's Neuralink*. IAI News. [Online] Available at: https://iai.tv/articles/the-dangers-of-musks-neuralink-auid-2092. [Accessed: *25 June 2022*].

Gayantha, N.D.G. (2012, April 13-16).

Psychological Analysis of "Telepathy" witha Buddhist Perspective. Conference: The Multi-faceted Nature of Research in the 21st Century. Volume: 13th Annual Research Symposium.

Hong G., Lieber M. (2019). *Novel electrode technologies for neural recordings*. Nat Rev Neurosci. Pp. 330-345. doi: 10.1038/s41583-019-0140-6.

Kaiju T., Doi K., Yokota M., Watanabe K., Inoue M., Ando H., Takahashi K., Yoshida F., Hirata M., Suzuki T. (2017). *High Spatiotemporal Resolution ECoG Recording of Somatosensory Evoked Potentials with Flexible Micro- Electrode Arrays*. Front Neural Circuits.Pp- 11:20. doi:10.3389/fncir.2017.00020.

Karunananda, A. (2002). Using an Eastern Philosophy for Providing a Theoretical Basis for Some Heuristics Used in Artificial Neural Networks. *Malaysian Journal ofComputer Science*, *15*(2), 28–33. Retrieved from https://ejournal.um.edu.my/index.php/MJCS/article/view/6051.

Kennedy, R. (2021, April, 17). *What Is Neuralink? How Does The Technology Work And What Can A Person Do With It?* Republicworld. [Online] Available at:https://www.republicworld.com/technolog y-news/other-tech-news/what-is-neuralink- how-does-the-technology-work-and-what- can-a-person-do-with-it.html. [Accessed:*25 June 2022*].

Lozanoska, J. (2020). "Chapter 9: Temporality, technology and justice in Hannah Arendt: acritical approach". *In Ethics and Politics of Space for the Anthropocene*. Cheltenham, UK: Edward Elgar Publishing. Retrieved Aug 22, 2022, from https://www.elgaronline.com/view/edcoll/9781839108693/9781839108693.00016.xml.

Merriam-Webste, *Merriam Webster.com Dictionary, Technic*. [Online] Available at: https://www.merriam-webster.com/dictionary/technic. [Accessed 13 Sep. 2022].

Migotti, M., & Wyatt, N. (2017). On the very idea of sex with robots. In John Danaher &Neil McArthur, *Robot Sex*. MIT Press. Massachusetts.

Musk E, Neuralink. (2019). *An Integrated Brain-Machine Interface Platform With Thousands of Channels.* J Med. Internet Res 2019;21(10):e16194. DOI: 10.2196/16194.

Nuwer, R. (2012, November 1). *The World's Happiest Man Is a Tibetan Monk*. Smithsonian. [Online] Available at: https://www.smithsonianmag.com/smart-news/the-worlds-happiest-man-is-a-tibetan-monk-105980614/.[Accessed: *25 June 2022*].

Pesaran B., Vinck M., Einevoll T., Sirota A., Fries P., Siegel M., Truccolo W., Schroeder E., Srinivasan R. (2018). *Investigating large-scale brain dynamics using field potential recordings: analysis and interpretation*. Nat Neurosci. Pp. 903-919. doi: 10.1038/s41593-018-0171-8.

Simondon, G., (1965). *Culture and technics*. Radical Philosophy. pp. 17–23.

Wakefield, J. (2021, April 9). Elon Musk's Neuralink 'shows monkey playing Pong with mind.' BBC. [Online] Available at: https://www.bbc.com/news/technology-56688812. [Accessed: 25 June 2022].

Yuste R. (2015). From the neuron doctrine to neural networks. Nat Rev Neurosci. Pp. 487-97. doi: 10.1038/nrn3962.