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本期主編：范瑞平、徐漢輝

腦機介面技術倫理學

前言：回應腦機介面技術的倫理挑戰

徐漢輝、范瑞平

主題論文：

與機器一起思考：腦機介面技術

萊瑞斯科、佐赫尼、
辛格、薩烏萊斯庫

為什麼侵入性腦機介面技術是危險的

翟振明

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腦機介面技術倫理學
The Ethics of Brain-Computer Interface Technology

本期編輯：范瑞平、徐漢輝
Issue Editors: Ruiping Fan and Xu Hanhui

徐漢輝、范瑞平 Xu Hanhui and Ruiping Fan	前言：回應腦機介面技術的倫理挑戰 Introduction: Addressing the Ethical Challenges of Brain-Computer Interface Technology
主題論文	
萊瑞斯科、佐赫尼、 辛格、薩烏萊斯庫 David M. Lyreskog, Hazem Zohny, Ilina Singh & Julian Savulescu	<u>與機器一起思考：腦機介面技術</u> <u>The Ethics of Thinking with Machines: Brain-Computer Interfaces in the Era of Artificial Intelligence</u>
評論	
崔利懷 Levi Checketts	<u>二十一世紀的顛相學</u> Phrenology for the Twenty-First Century
方旭東 Fang Xudong	人類未來與不確定性 <u>The Future of Humankind and Uncertainty</u>
王 珏 Wang Jue	廓清腦機介面的倫理視野：變與不變 <u>Ethical Horizons of Brain-Computer Interface Technology: Changes and Constants</u>
張舜清 Zhang Shunqing	腦機融合技術倫理：一種不確定的倫理話題 <u>Ethics of AI-BCI Technology: An Uncertain Topic</u>
尹 潔 Yin Jie	評《與機器一起思考》 <u>A Review on "The Ethics of Thinking with Machines"</u>
蔡 昱 Cai Yu	“標準人”的製造：ABT 應用中的技術權力問題 <u>The Manufacturing of "Standard People": Technical Power Issues in ABT Applications</u>
張言亮 Zhang Yanliang	在人工智能時代需要謹慎對待腦機介面技術 <u>Brain-Computer Interface Technology should be Treated with Caution</u>
呂雪梅、鄧 蕊 Lv Xuemei and Deng Rui	人工智能時代下腦機介面的倫理反思 <u>Ethical Reflections on Brain-Computer Interfaces in the Age of Artificial Intelligence</u>

王 玥、宋雅鑫 Wang Yue and Song Yaxin	審慎地擁抱未來 Embracing the Future with Caution
主題論文	
翟振明 Zhai Zhenming	為什麼侵入性腦機介面技術是危險的 Why Invasive Brain-Computer Interface Technology is Dangerous
評論	
劉俊榮 Liu Junrong	關於腦機介面技術風險的再思考——一個商榷 Rethinking the Risk of Brain-Computer Interface Technology
唐 健 Tang Jian	為侵入性腦機介面技術進行倫理辯護 Ethical Defense of Invasive Brain-Computer Interface Technology
劉佳寶 Liu Jiabao	比較技術倫理學視域下的腦機介面技術 Brain-Computer Interface Technology in the Context of Comparative Technology Ethics
韓 丹 Han Dan	非對稱原則：應對腦機介面技術的主體性風險 Asymmetry Principle: Managing the Subjective Risk of Brain-Computer Interface Technology
陳 旻 Chen Min	科技發展的倫理省思：評《為什麼侵入性腦機介面技術是危險的》 Ethical Reflections on Technological Development: A Review
賀 苗 He Miao	腦機介面的風險與受益權衡——評《為什麼侵入性腦機介面技術是危險的》 The Risk-Benefit Trade-off of Brain-Computer Interface Technology: A Review
李紅文 Li Hongwen	腦機介面與人類的未來 Brain-Computer Interface Technology and the Future of Humankind
劉月樹 Liu Yueshu	無盡的風險：反思應用倫理學的學科範式 Endless Risk: Reflecting on the Disciplinary Paradigm of Applied Ethics
葉金州 Ye Jinzhou	危險的不只是侵入性腦機介面 Invasive Brain-Computer Interfaces are not the only Danger
張新慶、王笑農 Zhang Xinqing and Wang Xiaonong	侵入性腦機介面之風險辨識及審查要點淺析 Identification of Risks Associated with Invasive Brain-Computer Interfaces and Reasons for its Ethical Review

摘要

腦機介面 (BCIs) 是大腦和電腦無需人工交互即可直接交流的一系列技術。隨著人工智能 (AI) 時代的到來，我們需要更多地關注腦機介面和人工智能的融合所帶來的倫理問題。那麼，與機器一起思考會帶來什麼樣的倫理問題？在本文中，圍繞這一主題，我們將重點關注以下問題：自主性、完整性、身分認同、隱私，以及作為一種增強的方式，該技術在兒科領域的應用會帶來怎樣的風險和潛在收益。我們的結論是，雖然該技術存在多種令人擔憂的問題，同時也有可能帶來好處，但仍存在很大的不確定性。如果生命倫理學家想在這一領域有所建樹，他們就應該做好準備來迎接我們對醫學和醫療保健領域中一些我們視為核心價值的理解的重大轉變。

[目錄](#)

二十一世紀的顛相學

崔利懷

摘要

儘管Lyreskog等人堅持認為人工智能腦機介面 (ABTs) 的使用需要新的“概念和框架”，但他們所依據的人的定義和人類繁榮模式似乎本身就值得商榷。雖然自主權或隱私權的問題很重要，但這些問題不應該從屬於這些技術本身所蘊含的價值觀以及技術在發展過程中所宣導的意識形態。ABTs技術超出嚴格的治療用途之上的應用得到了超人類主義者的支持，他們所認可的人類學偏向於神經典型主義，傾向於用工具理性的方法來進行道德評價。因此，我認為，ABTs的新“概念和框架”需要與批判性的聲音進行對話，以免ABTs成為本世紀版本的顛相學。

[目錄](#)

為什麼侵入性腦機介面技術是危險的

唐文明

摘要

承認涉及自我與他者之間的相互認可，因而可以將承認理論理解為一項關於人倫構成的哲學理論。本文首先分析黑格爾、霍耐特的現代承認理論的得失，特別對霍耐特所提出的“生存模式的承認”與黑格爾的“主奴辯證法”進行反思性分析，揭示出現代承認理論的人類學前提是將人理解為一個口只關注人的必死性的欲望的主體；之後回到奧古斯丁，通過重構奧古斯丁關於人從記憶中尋求上帝的描述，提出一種基於創造論 (proctology) 的承認理論，指出這種承認理論的人類學前提是將人理解為一個關注人的降生性的感應的主體；最後通過分析儒教經典中的相關論述，指出天人之倫乃是父子之倫、朋友之倫、君臣之倫的基礎，從而為一種宗教性的生命倫理學奠定理論基礎。

[目錄](#)

The Ethics of Thinking with Machines: Brain-Computer Interfaces in the Era of Artificial Intelligence

David M. Lyreskog, Hazem Zohny, Ilina Singh and Julian Savulescu

Abstract

Brain-Computer Interfaces – BCIs – are a set of technologies with which brains and computers can communicate directly, without the need for manual interaction. As we are witnessing the dawn of an era in which Artificial Intelligence (AI) quite possibly will come to dominate the technological innovation landscape, we are compelled to ask questions about the ethical issues which the convergence of BCIs and AI is poised to bring about. What are the ethics of thinking with machines? In this paper, we explore this question, focusing on some of the main arenas of ethical debate and contention, ranging from autonomy and integrity to identity and privacy, and discuss the risks and potential benefits of the technology in the domains of paediatric populations, and as a means of human enhancement. We conclude that, while there are multiple concerns as well as possibilities for the technology to do good, there are great uncertainties at play. If bioethicists want to stay relevant in this field, they ought to prepare themselves for seismic shift in how we conceptualise much of what we take to be core values in medicine and healthcare.

[Table of Contents](#)

The Future of Humankind and Uncertainty

Fang Xudong

Abstract

When talking about artificial intelligence brain–computer interface (AI-BCI) technology (ABT), the following question arises: will humans think alongside machines, or will they think by relying on machines? If the former scenario holds true, it seems incongruous with the intended purpose of ABT. Conversely, if the latter scenario proves to be true, Confucianism expresses optimism about its potential triumph.

[Table of Contents](#)

Ethical Horizons of Brain-Computer Interface Technology: Changes and Constants

Wang Jue

Abstract

“The Ethics of Thinking with Machines” (Lyreskog et al. 2023, 11–34) focuses on the ethical issues and debates caused by the development of brain–computer interface technology, and describes a changing moral landscape: some boundaries are blurred or broken, while some core values are reinvented. However, a constant concern underlies these changes, namely concern about “who I am.” This concern has become even more pressing in the current age of artificial intelligence.

[Table of Contents](#)

Ethics of AI-BCI Technology: An Uncertain Topic

Zhang Shunqing

Abstract

The ethical issues associated with brain–computer interface technology are mainly related to the development and application of artificial intelligence (AI), with the complexity of this problem and various worrying possibilities linked to AI’s inherent uncertainty. If AI remains under the overall control of human beings, especially if it is used only as a tool to serve people, the subject status of human beings in the world will not change, and traditional bioethical principles and conceptual systems can be used to analyze the ethical problems caused by this technology. However, if AI has the ability to use human reasoning or go beyond human reasoning, thereby subverting human subjectivity, traditional bioethics do not apply in the field. The possible problems and complexity of the ethics of brain–computer interface will depend on the extent of AI development. To ensure the continued relevance of bioethics to the field of technology, bioethicists today need to focus on how humans should regulate the development of AI.

[Table of Contents](#)

A Review on “The Ethics of Thinking with Machines”

Yin Jie

Abstract

In this paper, I first reiterate the views of Lyreskog et al. and stress the importance of discussing ethical questions in the context of ABT—a topic that has clearly not received enough attention in China. Second, given the current state of Chinese applied ethics, I focus on what Lyreskog et al. refer to as a “seismic shift in how we conceptualize much of what we take to be core values in medicine and healthcare” (Lyreskog et. al 2023, 11–34) to explain how to realize the innovative progress of ABT ethics in contemporary China. I agree in principle that frameworks aiming to offer ethical guidance in ABT situations should use ontologies and taxonomies that allow for conceptual flexibility and redesign. These frameworks should also be subjected to philosophical critique and modified in light of scientific practice.

[Table of Contents](#)

The Manufacturing of “Standard People” : Technical Power Issues in ABT Applications

Cai Yu

Abstract

The paper by David M. Lyreskog et al. explores the ethical challenges and opportunities that the application of ABT will bring. The findings are enlightening. This article provides insight into a possible technical power issue with the application of ABT, namely the manufacturing of “standard people,” including the standardization of emotions, which may stifle creativity. When assisting people’s thinking and cognition, ABT may overlook the correlation of emotional reactions and cause harm to humans. ABT may also obtain standard behavior patterns through big data statistics and use them to shape humans. Obviously, such situations constitute an abuse of technical power.

[Table of Contents](#)

Brain-Computer Interface Technology should be Treated with Caution

Zhang Yanliang

Abstract

The essay “The Ethics of Thinking with Machines: Brain-Computer Interfaces in the Era of Artificial Intelligence” summarizes the author’s fundamental views. It points out that we need to be cautious about brain–computer interface technology. In particular, we should be cautious when dealing with forms of such technology that may threaten human autonomy, psychological identity, personal identity, and personal privacy, and standardize the development of brain–computer interface technology in accordance with the five principles of technology ethics: improving human well-being, respecting the right to life, upholding fairness and impartiality, reasonably controlling risks, and maintaining open and transparent.

[Table of Contents](#)

Ethical Reflections on Brain-Computer Interfaces in the Age of Artificial Intelligence

Lv Xuemei and Deng Rui

Abstract

This paper reviews the important thesis of David M. Lyreskog, who provides a profound interpretation of the complexity and uncertainty of ethical issues associated with brain–computer interfaces in the age of artificial intelligence (AI) and lays the theoretical foundation for an ethical framework for AI–brain–computer interfaces in terms of autonomy, integrity, identity, and privacy. This paper responds to Lyreskog’s main points in terms of four dichotomies, namely bounded and unbounded, controllable and uncontrollable, self and non-self, and open and liberalized, to promote in-depth discussion of the ethical issues associated with AI–brain–computer interfaces.

[Table of Contents](#)

Embracing the Future with Caution

Wang Yue and Song Yaxin

Abstract

As a measure of biomedical intervention, brain–computer interfaces in the era of artificial intelligence (AI-BCI technology, ABT) pose enormous ethical challenges in terms of human autonomy, mental integrity, identity, data privacy, and control while achieving therapeutic goals. It is necessary to analyze and differentiate these ethical challenges one by one, but more importantly, to find the truly safest, most effective, and most ethical ways to implement biomedical interventions and ensure “responsible research and innovation” in biomedical fields. In the context of the international development of consistent ABT standards, the policy formulation of “a right to mental privacy” and brain data security in Chinese bioethics will be a heavy and arduous task.

[Table of Contents](#)

Why Invasive Brain-Computer Interface Technology is Dangerous

Zhai Zhenming

Abstract

People oppose the application of invasive brain–computer interfaces to humans, mainly because they still know little about the mechanism by which human consciousness is generated and such technology could erase human consciousness. In addition, people using brain–computer interfaces can easily be controlled by outsiders and lose their freedom. In other words, brain–computer interfaces violate the following three asymmetry principles. (1) From the object to the subject, the smoother the information flow, the better, and the higher the degree of control signal blockage, the better. (2) From the subject to the object, the smoother the control signal flow, the better, and the higher the degree of information sealing, the better. (3) The relaxation of the above two principles should be carried out using the most stringent procedure to ensure that each subject takes the lead. As a substitute for brain–computer interfaces, we can use the Internet and computers as a kind of “extended mind.” The principles of traditional Taoist philosophy also support opposition to invasive brain–computer interfaces.

[Table of Contents](#)

Rethinking the Risk of Brain-Computer Interface Technology

Liu Junrong

Abstract

Although intelligent robots can have rationality and thinking beyond those of ordinary people, they do not possess human dignity, nor can they become consistent with human beings in terms of social status, rights and dignity. Human dignity includes life dignity and personal dignity. Brain–computer interface technology may not only pose a serious external threat to the dignity of human life but also endanger the embodied existence of human beings, resulting in the separation of body and mind and violating people’s personal dignity.

[Table of Contents](#)

Ethical Defense of Invasive Brain-Computer Interface Technology

Tang Jian

Abstract

The idea that invasive brain–computer interface technology is dangerous is debatable. This technology requires ethical justification, recognizing the coexistence of their benefits and risks. The newly formed professional consensus in China illustrates that it is possible to develop forward-looking and binding ethical guidelines through multidisciplinary argumentation and stakeholder consultation. Invasive brain–computer interfaces need not be limited to the smallest scope of application. Invasive brain–computer interfaces for healthy people and for enhancement purposes will provide technical and ethical options for future human society. Therefore, research into invasive brain–computer interfaces should not be prohibited. Rather, we must be alert to the risky possibility of research and development on brain–computer interfaces becoming entirely driven by business interests and controlled by capital. Furthermore, Chinese Taoist wisdom does not necessarily reject this technology.

[Table of Contents](#)

Brain-Computer Interface Technology in the Context of Comparative Technology Ethics

Liu Jiabao

Abstract

Zhai Zhenming compares brain–computer interface (BCI) technology with artificial intelligence technology and other mind extension technologies (such as ChatGPT), which I refer to as “comparative technology ethics.” I believe that it is meaningful to conduct research using comparison in the field of bioethics or technical ethics. I attempt to develop this type of comparative research and propose a comparison between risk-in-experiment technology and risk-of-effect technology. Although in some respects BCIs fall into the first category, the question of whether BCIs should be prohibited should be analyzed on a case-by-case basis.

[Table of Contents](#)

Asymmetry Principle: Managing the Subjective Risk of Brain-Computer Interface Technology

Han Dan

Abstract

Based on the innovation of brain–computer interface technology and the development of application scenarios for brain–computer interfaces, Zhenming Zhai puts forward the “asymmetry principle” in his recent paper “Risk of Brain–Computer Interaction.” This principle can effectively control the risk of the subject to protect and maintain the subject status of the individual. This principle is a technical ethical requirement that must be respected when manually inputting information and signal.

[Table of Contents](#)

Ethical Reflections on Technological Development: A Review

Chen Min

Abstract

The emergence and application of brain–computer interface technology have raised many ethical concerns related to individual autonomy, privacy, and potential for abuse. I support technological progress, but I emphasize ethics first. I believe that the application of brain–computer interface technology should respect the inherent value and dignity of every life. Subject to caution, exploring the use of this technology to alleviate the suffering of terminally ill patients could be considered. The principles of non-maleficence and proportionality of benefits and risks should also be upheld when applying this technology. At the same time, it is necessary to formulate reasonable ethical standards for technology, establish ethics committees, and supervise the research, development, and application of this technology.

[Table of Contents](#)

The Risk-Benefit Trade-off of Brain-Computer Interface Technology: A Review

He Miao

Abstract

Brain–computer interface (BCI) and artificial intelligence (AI) technologies are the most high-profile and disruptive technologies of our time. Professor Zhenming Zhai presents a broad and informative argument for why invasive BCIs are dangerous, fully addressing the emerging issues and challenges caused by BCI and AI technologies. In the field of biomedical research involving human subjects, conducting a reasonable and scientific assessment of the risks and benefits of BCIs is a complex, challenging, and continuous process. In the new world of man–computer symbiosis, we should not focus only to the evolution of technology itself, but also reflect on the balance from within ourselves as humans. We should think carefully, discern wisely and act earnestly.

[Table of Contents](#)

Brain-Computer Interface Technology and the Future of Humankind

Li Hongwen

Abstract

The ethical issues raised by brain–computer interface technology may not be new, but they may be unprecedented in severity. Current research on bioethics focuses more on ethical issues related to technology, falling into the category of technology ethics rather than bioethics. Technological problems are constantly changing and endless, and each technology has its own value and characteristics, but ethical issues have been more or less the same since ancient times. This raises the question of whether technology is being renewed or whether ethics are not moving with the times. If the issues are just “old wine in new bottles,” then what is the significance and value of bioethics?

[Table of Contents](#)

Endless Risk: Reflecting on the Disciplinary Paradigm of Applied Ethics

Liu Yueshu

Abstract

Applied ethics is a discipline aimed at solving specific ethical problems that arise when traditional ethical theory cannot explain new moral phenomena. The disciplinary approach to applied ethics is not entirely reasonable, making it difficult to extricate oneself from specific ethical issues. Applied ethics should also seek to determine why humans constantly create many ethical problems, to effectively reduce the emergence of new moral crises.

[Table of Contents](#)

Invasive Brain-Computer Interfaces are not the only Danger

Ye Jinzhou

Abstract

Zhai Zhenming’s argument that invasive brain–computer interfaces are dangerous is timely and well grounded. However, the danger of (non-invasive) artificial intelligence (AI) technology is unduly overlooked. First, non-invasive AI can cause as much harm to human agency and freedom as brain–computer interface technology. Second, AI may push many people away from jobs that give meaning to their lives. At the same time, the attribution of responsibilities becomes difficult, if not impossible, with the involvement of AI in decision-making. Finally, optimism about treating generative AI as equivalent to human overlooks a fundamental difficulty of collective life, namely the problem of mutual assurance.

[Table of Contents](#)

Identification of Risks Associated with Invasive Brain-Computer Interfaces and Reasons for its Ethical Review

Zhang Xinqing and Wang Xiaonong

Abstract

Brain–computer interface (BCI) technology is an emerging disruptive technology, whose potential risks have been exposed in clinical trials and applications. BCI technology has the characteristics of dual use, and the BCI testing process involves unclear or uncertain risks. Therefore, ethics committees should fully review the ethical aspects of BCI trials in clinical settings.

[Table of Contents](#)