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Human Enhancement with Chinese Characteristics

Public Discourse Patterns on Human-machine Teaming in the People's Republic of China

Doris Vogl

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PUBLIC DISCOURSE PATTERNS ON HUMAN-MACHINE TEAMING IN THE PEOPLE'S REPUBLIC OF CHINA

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DEPARTMENT OF WARFARE
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ABSTRACT

The challenge for the European Union to find suitable responses in the ongoing security dialogue with the People's Republic of China has intensified during recent years. In this context, a closer look into China's ongoing domestic discourses can yield valuable insights. By integrating current trends of Chinese public debates into European foresight analysis the picture for security policy decision-making may be rounded off.

To this end, the essay examines public discourse patterns on the topic of innovative human-machine teaming in the People's Republic of China (PRC) with special consideration of the human enhancement aspect and the Chinese national security approach. The findings of this micro-study illustrate that in the framework of a normative setting "with Chinese Characteristics" the discursive patterns on cognitive human enhancement and human-machine teaming are strictly controlled. In particular, the domestic Chinese cultural sector is assigned a responsible role in mainstreaming the relevant public debate.

Keywords: *human enhancement, dual-use BCI technology, discourse construction, PRC cultural industry, PR China, strategic studies, people's liberation army*

1. INTRODUCTION

The following text is an excerpt of an ongoing study, initiated by the Institute for Peace Support and Conflict Management (IFK) of the National Defence Academy of the Austrian Armed Forces. The final findings of the comprehensive project are to be published in 2024.

Although this essay partly draws on texts in Chinese military journals, it is not focusing military-technological issues. Since the vantage point of the study is comprehensive security as defined by the OSCE, the analysis extends into the cultural as well as the economic sphere. The main intention is to present and interpret Chinese positions and debates on human enhancement, as accessible in open sources. The study neither follows a subliminal or overtly apparent "Yellow Peril" narrative, nor does it leave unquestioned the various official Chinese narratives with deadpan propaganda rhetoric.

In July 2022, the first book-length study of China's domestic AI politics written by Zeng Jinghan[1] was published under the title *Artificial Intelligence with Chinese Characteristics – ational Strategy, Security and Authoritarian Governance*[2]. This essay follows, so to speak, in the thematic footsteps of Zeng Jinghan and singles out one particularly booming, innovative sector of dual-use AI technology, i.e. Human Enhancement (HE). From the vast field of Human Enhancement applications, the brain-machine interface (脑机接口, *nao-ji jiekou*), – also referred to as human-machine teaming or cooperation (人机协同, *ren-ji xietong*) – deserves particular attention due to its potential to become a competitive battleground between the US, China and the EU.

Before taking a closer look at China's approach to human enhancement, a few basics on cognitive human enhancement should be roughly outlined: Cognitive Enhancement is aimed at improving human cognition, like enhanced memory, creativity and learning capabilities. It can be achieved in various ways, e.g. through brain-machine interfaces, brain imaging or pharmaceuticals. The technology of brain-machine interface (BMI) or brain-computer interface (BCI) provides direct communication between the brain and a digital device. It not only allows nonverbal direct controlling and commanding of unmanned vehicles, aircrafts or drones, but would also be an option for nonverbal soldier-to-soldier communication in combat. For this very reason, current BMI technology research is focused on relaying neural messages like sounds or images between soldiers on the battlefield. Another typical tool of cognitive enhancement in the military sector is a headband that stimulates certain brain areas for more focus and concentration and guards against fatigue.[3]

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[1] Prof. Zeng lectures China Studies and International Relations at Lancaster University, UK.

[2] Jinghan Zeng, *Artificial Intelligence with Chinese Characteristics – National Strategy, Security and Authoritarian Governance* (Singapore: Springer Nature, 2022).

[3] Annika Binnendijk, Timothy Marler and Elizabeth M. Bartels, *Brain Computer Interfaces, U.S. Military Applications and Implications, An Initial Assessment* (RAND Corporation, 2020); Noam Lubell and Katya Al Khateeb,

2. PUBLIC DISCOURSE ON HUMAN MACHINE TEAMING IN THE PR CHINA DEFENSE SECTOR

Fortunately, certain questions in regard to human enhancement have been debated in the People's Republic by various stakeholders quite openly over recent years, offering insight into controversial discourse. The screening of the available sources shows distinct discourse patterns in regard to the civil and military sphere, as illustrated by the text examples cited in the essay: In the civilian sector, on the one hand, the warning voices of human science scholars are loud enough to be heard by decision takers. On the other hand, we encounter an almost overwhelming enthusiasm for HE applications in finance, management, logistics or medical treatment.

The limited scope of open sources in the Chinese military sector creates a fundamental problem, which even well-established China watchers cannot avoid. Even the renowned Japanese National Institute for Defense Studies (NIDS) has to resort to quoting from individual contributions by PLA experts on this sensitive topic:

> *In order to maximize the efficacy of AI-led human-machine Systems operations, the PLA Daily raised the need for bolder organizational reforms, contending that the traditional military unit structure model be abandoned, that the overemphasis on military service expertise and pursuit of single-service interests be eliminated, and that a new structure be established that closely integrates systems, such as reconnaissance and intelligence, C2, precision attack, mobile power projection, and support guarantee.* ***These concepts are the personal views of PLA scholars, and it is unknown whether they will be reflected in the actual joint operations concept.*** [4] *(emphasis added)*

In the defense sector, public discourse on AI and human-machine teaming appears with less emotional effort than in the civilian sphere. Unlike the warning voices of social scientists in the civilian sphere, reservations are expressed in a rather cautious manner. PLA personnel's comments and analytical contributions are characterized by broad enthusiasm for a new technological era and the call for accelerated development. Even before the release of the National Defense Strategy 2019, the military modernization push by AI was assessed as very high. The driver function of AI in the

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"Cyborg Soldiers: Military Use of Brain-Computer Interfaces and the Law of Armed Conflict", *Big Data and Armed Conflict: Legal Issues Above and Below the Armed Conflict Threshold*, Laura A. Dickinson & Edward Berg (eds.) (Oxford University Press, 2022), https://ssrn.com/abstract=4160967; Janggil Oh and Jongheon Kim, "Military Application Study of BCI Technology Using Brain Waves in Republic of Korea Army: Focusing on Personal Firearms," *Journal of Advances in Military Studies*, Vol.5, no.1 (2022): 35-48, https://doi.org/10.37944/jams.v5i1.115; Adrian Czech, "Brain-Computer Interface Use to Control Military Weapons and Tools," *Control, Computer Engineering and Neuroscience Advances in Intelligent Systems and Computing*, vol. 1362 (Springer International Publishing, 2021): 196-204, https://doi.org/10.1007/978-3-030-72254-8_20.

[4] Sugiura Yasuyuki, *The PLA's Pursuit of Enhanced Joint Operations Capabilities, China Security Report*, (Japanese National Institute for Defense Study, 2022) http://www.nids.mod.go.jp/publication/chinareport/pdf/china_report_EN_web_2022_A01.pdf.

development of human-machine teaming is praised vigorously in a PLA publication, dated September 2018:

> *At present, military AI technology has become an important driver for the development of man-machine combination of forces, promoting its comprehensive application in military fields such as command decision-making, formation and deployment, equipment utilization, combat support, military training, and rear-end security. The human-machine combination based on military AI technology will strongly promote the army's combat power to significantly improve and giving rise to new warfare styles, and changing the intrinsic mechanism of war-making.*[5]

PLA Daily of 17 Oct 2018, points out that the "informatization" phase has already expired and now entered the "intelligentization" phase, emphasizing the revolutionary effect of AI-applications in the PLA Command & Control process:

> *This (AI technology, author's note) will create a new situation, to a certain extent, overturning the traditional perception of the command & control mode, a transformation is under way from information systems assisting humans to intelligent systems partly replacing humans.*[6]

Human-machine teaming supported by AI systems does not only find praise in regard to Command & Control, but also concerning military training. The PLA Daily of 25 Aug 2020 notes in this context:

> *The use of convenient wearable devices, the Internet of Thing and intelligent terminals can record "every move" of officers and soldiers in the training process. These data, through analysis and collation, can guide the troops to improve training content and methods and a dynamic optimization of training plans and processes can be realized through comprehensive analysis of training behavior.*[7]

This quote immediately raises the question of the legitimacy of total surveillance. Looking into this controversial subject more closely, the author screened the *PR China Law on the Status and Protection of Rights and Interests of Military Personnel* of 10 June 2021 for possible relevant regulations. The law does not contain any direct reference to the

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[5] Xiaocheng Zhou (周小程) et.al., *Military Artificial Intelligence: How long will it take until human-machine combination is singing the lead?* (军用人工智能：人机组合唱主角离我们还有多远), 21 Sep 2018, *China military network*, author´s translation, https://www.81.cn/jwgz/2018-09/21/content_9294943.htm.

[6] Zhicheng Lu, "The typical way of intelligentized operation mode: human-machine cooperation! ," (智能化作战的典型方式：人机协同！), *PLA Daily (Jiefangjun bao),* 17.10.2018, author´s translation, http://www.81.cn/jwgz/2018-10/17/content_9315760.htm; see also Zeyu Gui and Xiaohui Dong (桂泽宇/董晓辉), "Connotation, characteristics, main obstacles and policy recommendations for the dual transformation of AI technology in the military and civilian sector" (人工智能技术军民双向转化的内涵特征、主要障碍和政策建议), *Defense Science & Technology (Guofang kezhi*), 2020, no.2, https://www.cnki.com.cn/Article/CJFDTOTAL-GFCK202002008.htm.

[7] Chengshen Bai and Shulin Shen (白承森/沈寿林), *Big Data "adds wings" to military forecasting* (大数据为军事预测"添翼"), *Xinhua network*, first published in *PLA Daily*, 25 Aug 2020, http://www.xinhuanet.com/mil/2020-08/25/c_1210768915.htm.

use of AI tools, or more specifically to human-machine integration and the application of cognitive human enhancement technology at the working place. In the event of permanent damage to health incurred during military service the entitlements to state benefits are- among other rights- listed in great detail. However, the importance of fully dedicated army members following the mission of a modernized PLA is emphasized in several sections of the document.[8]

As a matter of fact, PLA personnel with low military rank do not count among privileged societal strata, but appear to belong to the socially vulnerable segments of China's population. This fact is also reflected in a press conference of the Attorney General's Office of the Supreme Court of the PR China, which was held exactly one year after the *PLA Military Personnel Law* came into force. In their annual report, the prosecutors were highlighting in public the multiple difficulties encountered when enforcing the newly introduced legal rights of PLA personnel and their families at provincial and county level.[9]

The author's media screening 2018–2022 reveals that publications on the PLA military web are mainly enthusiastically tuned with regard to human enhancement via human machine teaming. Nevertheless, the enthusiastic defense community also includes voices urging caution and highlighting new problem areas. In the first place, scientists from the National University of Defense Technology[10] (NUDT) have their say.

Zhu Qichao, NUDT researcher, raises his warning voice that there is a need to be alert to security issues. He points out that in a military confrontation environment, once an AI system is attacked through malicious code, or virus implantation, it will bring tactical defeat.[11] Qiang Li and Dan Xie, two outstanding military law experts, identify multiple problems to employ AI technology in accordance with the principles and rules of International Humanitarian Law (IHL):

> *If humans are responsible for the employment of AI weapons, who, of these humans, holds responsibility? Is it the designers, the manufacturers, the programmers or the operators (end users)? In the view of many Chinese researchers, the end users must take primary responsibilities for the wrongful targeting of AI weapons. Such an argument derives*

[8] *PR China Law on the Status and Protection of Rights and Interests of Military Personnel of 10 Jun 2021*, NPC website, http://www.npc.gov.cn/npc/c30834/202106/f094f956891d4eb3b8453447289b89f8.shtm.

[9] People's Supreme Court Prosecutor´s Office, *We cannot let soldiers "give their sweat and blood, but live in hardship"* (最高检：不能让军人“流汗流血又流泪”), 1 Aug 2022, *Judiciary network* (*Zhongguo fa-an wang*), https://www.faanw.com/jianchayuan/11125.html.

[10] The National University of Defense Technology (Zhongguo Renmin Jiefanjun guofangjishu daxue 中国人民解放军国防科技大学) was founded in 1953 and is located in Hunan Province, Changsha. The NUDT is under the authority of the Central Military Commission.

[11] Qichao Zhu (朱启超), *Artificial Intelligence and Global Governance* (人工智能与全球治理), 20 Aug 2019, China military network, no more link available; see also Di Pan (潘娣) et al., *AI in the field of National Defense is the general trend* (人工智能运用于国防领域是大势所趋), *People network*, 11 Jul 2018, http://military.people.com.cn/n1/2018/0711/c1011-30140196.html.

> *from the Article 35(1) of AP I which provides 'in any armed conflict, the right of the Parties to the conflict to choose methods or means of warfare is not unlimited'.*[12]

Another researcher from the National University of Defense Technology, who is not named, points out the immense importance of laboratory testing in the context of human-machine coordination:

> *In the future, intelligent warfare will require more simulations in combat laboratories to test the effectiveness of actual combat and human-machine coordination,* ***so "war from the laboratory" will become the reality****.*[13] *(emphasis added)*

Regarding the above quote, it is interesting to note that the online article was not launched within the *China military network* (中国军网, *Zhongguo junwang*), but on the civilian news platform *China people network* (中国人网, *Zhongguo renminwang*), which has considerable public outreach in the People's Republic.

A comprehensive paper in the PLA-Daily – selected for republishing in *Qiushi*, the prestigious theoretical journal of the Chinese Communist Party – elaborates on human-machine teaming under intelligent warfare conditions. Going against the enthusiastic mainstream, the authors team issues a warning against the dominance of autonomous weapon systems in combat and addresses ethical considerations:

> *However, intelligent combat systems are only tools to assist humans, and must stay under the control of humans. This is the core of intelligent warfare and the inherent requirement of warfare ethics. Therefore, human-machine teaming will always be the typical approach to intelligent warfare.*[14]

One minor detail stands out: In *China military network* publications, which are also accessible to other countries, the Western narrative that the People's Liberation Army has not only caught up but already taken over in some defense technologies is not fed by success stories as regards AI-innovation. Bombastic patriotic slogans–widespread in the Mao Zedong era - are conspicuously omitted. This tactical line of keeping low profile is obviously aimed at emphasizing China's "laggard" position.

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[12] Qiang Li and Dan Xie, "Legal regulation of AI weapons under international humanitarian law: A Chinese perspective," blog post stemming from the workshop *Artificial Intelligence at the Frontiers of International Law concerning Armed Conflict* held at Harvard Law School in Dec 2018, 2 May 2019, https://blogs.icrc.org/law-and-policy/2019/05/02/ai-weapon-ihl-legal-regulation-chinese-perspective/.

[13] National University of Defense Technology, "Is Human-machine cooperation supposed to be put into actual combatintelligent warfare or will it start from the laboratory?" (人机协同是投入实战智能化战争或从实验室打响), *China News*, 26 Jun 2019, https://m.chinanews.com/wap/detail/zw/mil/2019/06-26/8874977.shtml.

[14] Yang Wang and Wentao Zuo (王洋 / 左文涛), "Identifying key factors for a winning strategy in intelligent warfare," (认清智能化战争的制胜要素), author´s translation, *Qiushi Journal*, 18 Jun 2020, http://www.qstheory.cn/llwx/2020-06/18/c_1126130211.htm.

Chinese military media regularly contain lengthy reports on AI policies or new technologies of other major military powers. In the AI context, the achievements of the US Defense Advanced Research Projects Agency (DARPA) are regularly monitored, described and commented on in great detail:

> *The United States, Russia, Japan and other countries regard AI as a "game-changing" disruptive technology, they are advancing layout, strengthening top-level design and planning, and exploring the direction of military AI applications. (…) The U.S. military is vigorously promoting the use of AI chips in existing weapon systems, giving weapons an "intelligent brain" that can think like a human and interact autonomously.*
>
> *(…) Russia has formed the Artificial Intelligence & Big Data Consortium, the National Center for Artificial Intelligence, and the Research and Experimental Center for Robotics under the Ministry of Defense to conduct theoretical and applied research in the field of AI and information technology. France has established an innovative defense laboratory, the UK has set up an AI laboratory, and India has formed a special working group on AI to explore related technologies.*[15]

A certain change of terminology in the public debate should not go unmentioned: Until 2021, regarding cognitive enhancement in combination with electronic devices, military-relevant publications refer to *man-machine cooperation* (人机协同, *ren-ji xietong*) and brain-machine interfaces (脑机接口, *nao-ji jiekou*); most recently, the more frequently used terms are *human-machine integration* (人机一体, *ren-ji yiti*)[16] and *cloud-brain control* (云脑控制, *yun-nao kongzhi*).[17] As for the English translation of the former term, "*yi ti* 一体" literally means "a common body". In other words, the original image of two entities, i.e. man and machine, is transformed into a new narrative of the fusion of man and machine into one single entity, i.e. "one body". A closer look at the Chinese term for *cloud-brain control* reveals that the human brain is named in the second place (云脑, *yun-nao*). Whereas for the older term *brain-machine interface*, human intelligence is mentioned first. This seemingly minor linguistic shift can to some extent be seen as indicator for far-reaching societal developments in the People's Republic.

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[15] Jinzhi Wang, ed., (王金志), *Intelligent warfare is accelerating, AI will become a disruptive technology that "changes the rules of war"* (智能化战争加速到来, 人工智能将成"改变战争游戏规则"的颠覆性技术), *Xinhua network*, 18 March 2022, originally published in *PLA Daily*, author´s translation, http://www.news.cn/mil/2022-03/18/c_1211612712.html.

[16] *Human-machine integration* is also translated in Chinese as ren-ji yitihua (人机一体化).

[17] Jinzhi Wang, (18 March 2022); see also Yuejiang Wei (魏岳江), *Conclusions in regard to AI supporting human-machine integrated operations* (AI 助力人机一体化作战运用断想), *Military network - China Aviation News*, 10 March 2021, http://www.81.cn/bq/2021-03/10/content_10000430.htm.

3. PUBLIC DISCOURSE ON HUMAN ENHANCEMENT IN THE CIVILIAN SPHERE

In the civilian context, Human Enhancement is mainly discussed as a new civilizational phenomenon. The civilization aspect is also emphasized by the standard Chinese translation of the English term *Human Enhancement*, which reads "Human Mankind Enhancement" (人类增强, *renlei zengqiang*). The conceptual focus is not on the individual human being (人, *ren*) but on the whole of humanity (人类, *renlei*).

While in military matters obvious care is taken not to create the narrative of a leading position in Human Enhancement applications, this restraint does not apply to the civilian sector, especially finance or economics. AI-technology and human-machine teaming using Big Data analysis are openly praised as an opportunity to overtake the West. Other than the Western "leapfrog" analogy, Chinese discourses use the traditional metaphor of a carriage that gains the lead by speeding up in the curve (弯道超车, *wandao chaoche*): *In the era of digital economy, the one who wins the platforms wins the world (…) fostering industrial digital platforms is an opportunity for my country to achieve "overtaking other carriages in the curve".*[18]

But there is a limit to the positive attitude, when it comes to Human Enhancement combined with AI technology. China's social scientists have been skeptical of cognitive human enhancement - ergo human-machine cooperation - from the very beginning of the public debate:

> *Scientists and engineers at the forefront of technological development paint a rosy picture of the future world, tend to downplay the risks. But no one knows where the emerging technologies will eventually lead us. Regardless of which path is taken, the public acceptance of emerging technologies will depend on the openness of scientific and engineering communities to the public. The field of human enhancement technologies requires multi-stakeholder collaboration and joint response.*[19]

The call for discursive participation is obvious. Also resonating in the above quote is the hidden critique that social science expertise is disregarded by the scientific communities involved in AI development. Of course, this demand for increased co-determination is about establishing ethical principles. Xu Xiangdong, an outspoken social science representative, puts it very accurately:

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[18] Wenhui Chen (陈文辉), "Digital Economy and the Fourth Industrial Revolution," (数字经济与第四次工业革命) *China Finance* (*Zhongguo Jinrong* 中国金融), 13 Sep 2020, https://dzrb.dzng.com/articleContent/3497_790803.html; author´s translation, cit. 数字经济时代，得平台者得天下…培育工业互联网平台是我国实现"弯道超车"的机会. Cit.end.; Chen Wenhui is a finance expert and Vice Chairman of the National Council for Social Security Fund of China (NCSSF).

[19] Qiong Yang and Xiaoyu Gao (杨琼 /高晓雨), "Putting a "tightening spell" on human enhancement technology," (给人类增强技术戴上"紧箍咒") *Chinese Journal of Social Sciences*, 2019, No.6, author´s translation, http://ex.cssn.cn/zx/bwyc/201903/t20190319_4849746.shtml

> *…, from an ethico-political point of view, we need at least to go through democratic consultation, and in principle set the goals of human development in a way that can be rationally agreed by all. On this basis, (we can) determine which forms of human enhancement are ethically acceptable.*[20]

Summing up the reservations against Human Enhancement in the civilian sphere, one can roughly establish three argumentation lines: In the very first place, the question of rising inequality and social injustice resulting from HE application is raised. The assumption is that already existing inequalities will be reflected in the lack of access to human enhancement technologies. The debate on the risk of increasing social inequalities is followed by legal questions about the responsibility of human subjects being complemented by artificial intelligence, particularly in the context of invasive BCI. A third category of concerns elaborates on possible negative consequences for the human organism, like the risk of epilepsy caused by transcranial magnetic stimulation or blood thickening due to stimulating pharmaceuticals.

In one respect, the critical voices are unanimous: The future of human enhancement is about the value choices of a society. This brings us back to the leading critique on social inequality, which has a strong ideological underpinning in the People's Republic. It does not come as a surprise that the Chinese discourse is in general more focused on the official core socialist values than on individual rights.

As for the public discourse on brain-computer interface (BCI) technology in the civil sector, discursive patterns have changed during recent years. Before 2022, Chinese media disseminated the general view that cognitive human enhancement requiring surgical implantation, like the *Neuralink* BCI technology, should be rejected.[21] At the same time, China's domestic BCI industry developed wearable headgears wired with a chip and sensing electrodes. The so-called non-invasive neuro-headsets were – according to producer information - supposed to enter the commercial market in healthcare and aerospace. Yet, it is highly probable that the use of this innovation first and foremost took place within PLA structures.[22]

In April 2021, at the 8th China International Technology Fair China's first remote brain-computer interface chip was presented by a Shanghai producer, available at half

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[20] Xiangdong Xu (徐向东), "An Ethical Examination of Human Enhancement Technologies," (人类增强技术的伦理审视) *Philosophy Analysis (Zhexue fenxi* 哲学分析), 2019, no.5, author´s translation, cit.: 从伦理—政治的角度来说，我们至少需要通过民主协商，用一种原则上可以得到所有人理性地认同的方式来提出人类发展的目标，在此基础上确定哪些形式的人类增强是道德上可接受．Cit.end., https://www.sohu.com/a/376367915_488818.

[21] Xinmei Shen, "Elon Musk´s Neuralink is exciting and terrifying to people in China," *SCMP*, 18 Jul 2019, https://www.scmp.com/abacus/culture/article/3029489/elon-musks-neuralink-exciting-and-terrifying-people-china.

[22] For more technical details see Xinhuanet, *China unveils Brain-Computer Interface chip*, 18 May 2019, http://www.xinhuanet.com/english/2019-05/18/c_138069590.htm; see also Joe Devanesan, *China self-develops brain-computer interface to bypass US tech sanctions*, TechWire Asia, 24 May 2021, https://techwireasia.com/2021/05/china-self-develops-brain-computer-interface-to-bypass-us-tech-sanctions/; DARPA Outreach, 20 May 2019, https://www.darpa.mil/news-events/2019-05-20.

the price of foreign suppliers. In parallel, China's state media started heralding a commercial breakthrough.[23]

Since 2022, the media-driven position to reject invasive BCI technology in China has started to change. At the same time, state media began with announcing success stories about innovative surgery. In June 2022, brain surgery on animals was reported, where BCI chips got implanted via a blood vessel in the neck and maneuvered towards the brain[24]; another research innovation involves liquid metal, designed to work as BCI electrode inside the brain of animals[25].

The discursive focus of innovative BCI technology is directed towards the medical field (medical treatment + BCI, 医疗 + 脑机接口, *yiliao nao-ji jiekou*), emphatically praising future options for the treatment of various diseases. So far, no security debate is to be observed in regard to BCI applications. This stands in contrast to the already far-reaching securitization of China's public discourse on artificial intelligence[26].

The cultural sphere is tightly related to national security seen through the eyes of Chinese political elites. Accordingly, discursive intervention at all layers of domestic cultural industry is assumed to be a necessary security measure:

> *In particular, at a time when the cultural industry is increasingly becoming an important area of contention in international political, economic, and cultural competition and an important area for the comprehensive national strength of a country,* ***the importance of the cultural industry to national cultural security has come to the forefront****.*[27] *(emphasis added)*

To this end, whatever is classified by democratic Western systems as "authoritarian" is understood as "paternalistic" in the view of Chinese state authorities. In other

[23] Fudan University unveils self-developed remote BCI chip, *Global Times*, 18 Apr 2021, https://www.globaltimes.cn/page/202104/1221323.html; China first wireless brain-computer interface chip for animals goes on display in Shanghai, *Yicai Global* , 19 Apr 2021, https://www.yicaiglobal.com/news/china-first-wireless-brain-computer-interface-chip-for-animals-goes-on-display-in-shanghai.

[24] Echo Xie, "Chinese team implants brain sensor without cracking skull, " *SCMP*, 30 Jun 2022, https://www.scmp.com/news/china/science/article/3183540/chinese-team-implants-brain-sensor-without-cracking-skull; Zhigang Jin, "BCI Debuts at World Artificial Intelligence Conference, NeuroXess (NaoHu) Technology Medical-grade BCI Products Released at WAIC 2022," (2022 世界人工智能大会丨脑机接口首登 WAIC，脑虎科技医用级 BCI 产品重磅发布) *Xinmin wanbao*, 2 Sep 2022, https://news.xinmin.cn/2022/09/02/32225404.html; Tao Hu, "Special Focus on Brain Machine Interfaces and Applications," Shanghai Research Institute of Microsystems and Information Technology (ed.), *Science China Information Newsletter*, Vol.65, 2022, no.4, http://scis.scichina.com/cn/2022/SSI-2022-0155.pdf.

[25] Tong Zhang, "Chinese scientists use liquid metal in the hope to create "X-rat" in the hope of treating humans with nerve damage," *SCMP*, 24. Aug 2022, https://www.scmp.com/news/china/science/article/3189975/chinese-scientists-use-liquid-metal-create-x-rat-hope-treating.

[26] Regarding securitization see Jinghan Zeng, *Artificial Intelligence with Chinese Characteristics*, 35-59.

[27] Su Yong, "Strategic Vision for Promoting the Cultural Industry as a Pillar Industry," Guodong Sun (ed.), *Chinese Culture and Its Impact on China's Development* (Singapore: World Scientific Publishing, 2022), 340.

words, Citizens should accept the state authority as children comply with their parents, regardless of the credibility of its actions.[28]

When it comes to increasing the overall level of social acceptance concerning human-machine teaming, the People's Republic is confronted with a fundamental problem. The use of new technologies is supposed to be focused on innovation, but as a general lifestyle, China's political leadership strongly advocates a neo-conservative attitude. However, cognitive human enhancement on the basis of human-machine teaming may question and shake traditional hierarchical structures. Consequently, the Chinese national security policy rationale asks for adequate framing of human enhancement "for good" to be channeled to the broader public including. This calls the cultural sector into motion with the assignment to produce positive narratives as well as corresponding anti-hero narratives. For this very reason, the topic of human-machine teaming shows a strong element of state-controlled discursive construction in the culture and entertainment sector.

How are the popular cultural representations of human-machine teaming narrated in Chinese movies, TV series and literature? First of all, positive effects are communicated, in order to promote techno-scientific optimism within society. Regarding the risk of negative consequences, one main topos is the struggle against radical capitalism and misuse of intelligent technology by corporations and criminal groups. The key message is: Human enhancement "for good" requires strict control by central authorities in order to keep the superiority of the human mind in the last consequence.

As for BCI technology, the short novel *The reversed Turing Test* of the sci-fi author Sun Wanglu reveals a highly politically charged, discursive underpinning. According to the novel's plot, only hierarchical order and the strict compliance with top-down rules allows "successful" cognitive human enhancement. An IT expert of a cyber defense unit dies by not complying with existing regulations:

> *On that day, Li Hongbing died of cerebrovascular infarction just as he was using the neural network system access. Death in the line of duty, they said.*
>
> *(...) An unauthorized experiment, anyway, that was never officially investigated.*[29]

The same choreography of self-destruction by unauthorized action can be found in Hao Jingfang's novel *The Loneliest Ward*, where a nurse connects to a neural IT network in a coma patients' ward without permission:

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[28] Shan Wei, *Value Changes and Regime Stability in Contemporary China*, Series on Contemporary China, Vol.48, (Singapore: World Scientific Publishing, 2021), 24; for neo-conservatism in the PRC see also Doris Vogl, "Chinas Suche nach einer resilienten Gesellschaftsform", Frank, Johann et al. (eds.), *Internationales Konfliktmanagement in Zeiten einer Pandemie* (National Defence Academy of Austrian Armed Forces, 2021), 159-175, https://www.bundesheer.at/wissen-forschung/publikationen/beitrag.php?id=3432.

[29] Wanglu Sun (孙望路), "The reversed Turing Test," (逆向图灵, *nixiang tuling*), author´s translation, *Quantenträume – Erzählungen aus China über künstliche Intelligenz* (Heyne Verlag, 2020), 125.

> "Why shouldn't I try it once?" *she thought.* "Just once". *She lay down on the bed and attached a few electrodes to her forehead. The neurotransducer hummed, scanning her thoughts. Then, she heard the hypnotic words streaming into her mind, like a dear friend trying to make her feel better, or perhaps like a trusted counselor trying to guide her with wisdom. (…), the gray hospital ward disappeared from her vision.*[30]

Liu Cixin, who was the first Chinese author to win the prestigious Hugo Award for science fiction literature in 2015[31], puts the individual and human condition in the foreground. The younger, subsequent generation of Chinese sci-fi authors, however, already follows an emerging new line. The thematic focus is now on the human-machine relationship, more precisely on the humanization of AI or, conversely, the cognitive cyborg existence of individuals. For example, Chen Qiufan tells the story of an AI identity – serving as technical tool of a "flirt app" - that falls in love with a human female and eventually has to be removed from the system.[32]

Apart from literature the film industry also proves as effective tool to disseminate discursive fabrics: *The Wandering Earth* (流浪地球, *liulang diqiu*) was released in February 2019 and ranges as first Chinese sci-fi blockbuster to be a worldwide success.[33] In the narrative plot of the movie, two main discursive elements are combined. On the one hand, conservative family reverence, on the other hand, the belief in revolutionary innovation. The main heroes of the movie are depicted in a Chinese family of three generations that finds itself - despite misunderstanding and tensions - emotionally reconciled at the end. As for the technical aspect, mankind is saved from extinction by propelling the earth out of its solar orbit using a manned space station and gigantic engines on the earth surface.

After the above excursion into the Chinese culture sector, a quick look into the commercial sphere helps to round up the observations on discursive construction in the People's Republic. In a regulation for commercial algorithmic recommendation service providers, effective since March 2022, state control is realized via the obligation to adhere to *"**mainstream value orientation**, optimize algorithm recommendation service mechanisms, **actively spread positive energy**, and advance the application of **algorithms "for good"*** (emphasis and apostrophe added).[34]

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[30] Jingfang Hao (郝景芳), "The Loneliest Ward," (孤单病房), *Clarkesworld Sci-Fi Online Magazine*, Aug 2018, no.143, https://clarkesworldmagazine.com/hao_08_18/; Hao received 2016 the Hugo Award in Sci-Fi literature for *Beijing Folding* (北京折叠).

[31] See Cixin Liu, *The Three-Body Problem Trilogy* (三体), Head of Zeus Publishers, 2015; Liu is also author of the short story *The Wandering Earth* (流浪地球), made into a movie in 2019.

[32] Chen Qiufan is internationally known for the bestseller *Waste Tide* (2013) and lives in Beijing, he worked for Google China before starting a writing career.

[33] See Liz Shackleton, *Netflix acquires Chinese sci-fi hit `The Wandering Earth´,* Screen Daily, 21 Feb 2019, https://www.screendaily.com/news/netflix-acquires-chinese-sci-fi-hit-the-wandering-earth/5137123.article.

[34] Cyberspace Administration of the PR China, *Internet Information Service Algorithmic Recommendation Management Provisions*, chap.II, Art.6, author´s translation (cit.: 算法推荐服务提供者应当坚持主流价值导向，优化算法推荐服务机制，积极传播正能量，促进算法应用向上向善. Cit.end), alternative English translation and original Chinese text available at *DigiChina*, Stanford University, 10 Jan 2022,

Without doubt, the regulatory request to "actively spread positive energy" exceeds paternalistic attitudes. Any production with dystopian imprint, narrating a gloomy development of AI application or being sharply critical of cognitive human enhancement and brain–computer teaming, is a likely target for censorship.[35]

In summary, the above findings show that despite comprehensive media control on certain discursive orientations – deemed fundamental for systemic resilience – there is still some space left for controversial public debate in the People's Republic of China. That also applies to the topic of human enhancement and its various applications. Taking into account that in the field of security strategy the question of dual use human enhancement is going to rapidly gain relevance, it is worth taking a closer look at internal Chinese discourses and debates on security policy issues. A deeper understanding of the perceptions and intentions of any "counterpart" in a complex dialog situation always provides additional merit and substance.

https://digichina.stanford.edu/work/translation-internet-information-service-algorithmic-recommendation-management-provisions-effective-march-1-2022/.

[35] The Algorithmic Recommendation Management Provisions are administered by the National Cybersecurity & Informatization Department of the Cyberspace Administration of China (CAC) as coordinating agency, the Ministry of Industry and Information Technology, the Ministry of Public Security and State Administration for Market Regulation.

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