Forms and Philosophical Problems of Natural Persons, Digital Humans, and Robots in the Cyber Age

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Abstract

With the development of the Internet and artificial intelligence, cyberspace is gradually integrating into human daily life, while the boundaries and identity cognition of humanity itself are undergoing unprecedented reconstruction and challenges. This paper aims to explore the new forms of existence of various "human" and "human-like" entities (including, in a broad sense, human-like machines, virtual humans, etc.) and their philosophical significance against the backdrop of technological expansion in the cyber era, thereby providing a systematic perspective for philosophical research concerning "human" . First, this paper examines existing concepts such as natural persons, digital humans, and robots, then from the perspective of cyberology (the study of the relationship between humans and networks), subdivides the forms of "human" into five categories: Biological Human, Human with Cyborg, Digital Twin Human, Virtual Digital Human, and Robot. Subsequently, for each "human-like" type except Biological Human, it discusses philosophical issues such as ontology, identity, ethics and rights, death and survival, subjectivity and agency, authenticity and simulation. This study aims to promote a deeper understanding of the evolution of human existential conditions in the digital age, and to stimulate interdisciplinary dialogue to jointly explore the ethical and philosophical challenges posed by emerging human forms.

Full Text

Preamble

The Entity Types and Philosophical Issues of Natural Humans, Digital Humans, and Robots from a Cyberism Perspective

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Abstract

With the rapid development of the Internet and artificial intelligence, cyberspace has become increasingly intertwined with human daily life, while the boundaries and identity of humanity itself are undergoing unprecedented reconstruction and challenge. This paper aims to explore the new entity types and philosophical implications of various "humans" and "quasi-humans" (broadly including humanoid machines and virtual humans) within the technologically expanded context of the cyber age, thereby providing a systematic perspective for philosophical research on the nature of "human." First, this paper examines existing concepts of natural humans, digital humans, and robots. Then, from the perspective of cyberism—the study of relationships between humans and networks—it further classifies "human" entity types into five categories: Biological Human, Human with Cyborg, Digital Twin Human, Virtual Digital Human, and Robot. Subsequently, focusing on the "quasi-human" categories other than the biological human, the paper discusses philosophical issues concerning ontology, identity, ethics and rights, mortality and persistence, subjectivity and agency, as well as authenticity and simulation. This study seeks to deepen understanding of the evolution of human existence in the digital age and stimulate interdisciplinary dialogue to collectively address the ethical and philosophical challenges posed by emerging human entity types.

Keywords: Humans; Digital Humans; Robots; Philosophy; Cyberspace

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Since the emergence of humanity on Earth millions of years ago, humans have evolved within three fundamental living environments: physical space, social space, and thinking space. Physical space shapes our bodies and perceptions [1], social space constructs interpersonal relationships and cultural order [2], and thinking space carries our mental patterns and subjective experiences [3]. In contrast, modern electronic computers have existed for less than a century, yet within a few short decades they have spawned a series of new technologies—including the Internet of Things, big data, and artificial intelligence—that have gradually formed a powerful cyberspace, becoming humanity' s fourth fundamental living space [4][5][6]. Cyberspace has profoundly transformed human production and lifestyles and may potentially rewrite the history of human civilization. For instance, remote work [7] and online education [8] have broken traditional temporal and geographical constraints, reshaping how we work and learn; e-commerce platforms and digital payments have revolutionized consumption patterns [9]; and social media and virtual communities have profoundly influenced interpersonal interaction and social structure [10]. Meanwhile, AI-assisted healthcare [11], autonomous driving technology [12], and smart manufacturing [13] are pushing production methods toward greater intelligence and automation.

Against this evolutionary backdrop, humans are gradually achieving deep integration with technology, expanding into multiple forms of existence that involve both bodily and cognitive enhancement, as well as virtual mapping and reconstruction of identity and memory. These new forms not only reflect how technological progress redefines the individual human being but also raise a series of profound questions in ontology, ethics, and cognitive philosophy.

Therefore, this paper analyzes existing concepts of natural humans, digital humans, and robots from the perspectives of cyberism and philosophy to characterize the multiple existences of "human" in the cyber age. Specifically, it subdivides natural humans into Biological Human and Human with Cyborg, and digital humans into Digital Twin Human and Virtual Digital Human. Here, Robot will not be further subdivided. These "quasi-human" types embody evolutionary trends such as identity projection in cyberspace, technological enhancement in physical space, role transformation in social space, and cognitive reconstruction in thinking space. Building on literature review and research, this paper provides systematic definitions of these "human" forms and explores the philosophical issues they raise.

The main contributions of this paper are:

1. It systematically defines and precisely characterizes the philosophical features of five "human" and "quasi-human" forms in the cyber age, providing a new perspective for philosophical research on "human."
2. It elaborates on the various philosophical issues triggered by these five different "human" forms, such as core topics including the reconstruction of identity and self, mental privacy and cognitive freedom, embodiment and virtual experience, and technological empowerment and ethical responsibility, thereby promoting the rethinking and expansion of traditional philosophical paradigms.

The remainder of this paper is organized as follows: Section 2 defines the Cyber-Physical-Social-Thinking (CPST) space and cyberism. Section 3 provides definitions for the five different "human" and "quasi-human" forms. Sections 4 through 7 summarize the philosophical issues raised by Humans with Cyborg, Digital Twin Humans, Virtual Digital Humans, and Robots. Section 8 concludes the paper and outlines future research directions.

2 CPST Space and Cyberism Definitions

2.1 CPST Space Definition

CPST (Cyber-Physical-Social-Thinking) is an abbreviation for physical space, social space, thinking space, and cyberspace. Their conceptual explanations are as follows [14][15].

Physical space refers to entities in nature or those manufactured by humans and their environments. It operates according to physical laws in continuous

time and achieves real-time monitoring and feedback control of the external environment through semantic sensors or actuators that perceive and control physical objects.

Social space consists of social attributes, relationships, and activities among human individuals and groups, including interpersonal interaction, organizational collaboration, and social networks. It describes the connections and evolution among human-machine-thing relationships at the levels of values, preferences, information exchange, and social behavior.

Thinking space is composed of human thought and machine intelligence, representing the domain where advanced intellectual activities such as cognition, judgment, reasoning, learning, and adaptation occur. This space captures and generates "thought" information such as analysis and decision-making through algorithms including adaptive learning, deep learning, and reinforcement learning.

Cyberspace is a virtual digital environment built upon information networks, primarily containing discrete logical data in the form of "0" and "1," as well as various digital resources and abstractions. It enables interconnection, interaction, and collaboration among entities, services, and users at the "virtual" level.

As shown in Table 1 , examples of human interaction with the four spaces are listed. This demonstrates that CPST space has become deeply integrated with human production and lifestyle, while also implicitly indicating that human forms are being transformed by this integration.

Table 1: Examples of Human Interaction with Four Spaces

Human–Cyberspace: Artificial intelligence (intelligent assistants, recommendation systems); embodied intelligence (robots, bionic devices); virtual/augmented reality (VR/AR games, training); social media and online communities (Weibo, Discord); digital twins (for urban planning, medical experiments); Internet of Things (smart homes, smart city sensor networks); metaverse platforms (Decentraland, Roblox); blockchain and decentralized applications (NFTs, DeFi).

Human–Physical Space: Natural science investigations (geological exploration, ecological monitoring); architectural design and urban planning (green buildings, public spaces); environmental protection and sustainable development (wetland restoration, afforestation); sports and bodily experiences (mountaineering, garden walks); Daoism; Feng Shui practices and natural harmony; Twenty-Four Solar Terms and agricultural production.

Human–Social Space: Social networks and interpersonal interaction (offline salons, online forums); cultural inheritance and festivals (Spring Festival temple fairs, Halloween parades); economic activities and markets (e-commerce transactions, sharing economy platforms); political participation and public affairs (community councils, voting systems); education systems and knowledge dissemination (schools, online courses); family relationships and social structures

(neighborhood mutual aid, community organizations); media and public opinion (news websites, podcasts); Confucian thought and ritual culture.

Human–Thinking Space: Religious beliefs such as Buddhism, Christianity, and Islam; Western philosophical schools (materialism, existentialism); psychology and cognitive science (behaviorism, cognitive behavioral therapy); creative and artistic thinking (design thinking, cross-boundary innovation); moral ethics and values (utilitarianism, virtue ethics).

2.2 Cyberism Definition

Existing philosophical systems provide profound insights into understanding the relationship between humans and different living spaces. Figure 1 [Figure 1: see original paper] illustrates the four fundamental living spaces for humans and their interactive relationships, where H-C (Human–Cyberspace), H-P (Human–Physical Space), H-S (Human–Social Space), and H-T (Human–Thinking Space) represent the relationships between humans and cyberspace, physical space, social space, and thinking space, respectively. Specific examples of these relationships are shown in Table 1. For instance, in traditional Chinese culture, Confucianism primarily focuses on the relationship between humans and social space, Buddhism explores the inner experience of humans in cognitive space, and Daoism emphasizes harmonious coexistence between humans and natural space.

As cyberspace penetrates every aspect of human production and life, recent research has proposed cyberism [4] to specifically study the relationship between humans and cyberspace. Cyberism encompasses rich content, including theoretical dimensions such as philosophy and science, as well as practical domains like coordination and governance, ethics and morality, culture and arts, cognition and psychology, and disease and health. Cyberism will raise a series of new fundamental questions that profoundly challenge traditional research perspectives on human-nature, human-society, and human-cognition relationships, and may systematically reshape existing disciplinary systems, exerting far-reaching influence on the development of human civilization and even cosmic exploration. This paper will elaborate on the five forms of "human" and "quasi-human" and the philosophical issues they raise from the perspective of cyberism.

Figure 1 [Figure 1: see original paper]: Human Relationships with Four Spaces: Confucianism, Buddhism, Daoism, and Cyberism

3 Definitions and Classifications of Five "Human" and "Quasi-Human" Forms

This chapter summarizes relevant literature, gives particular consideration to the concept of four spaces, and then provides conceptual definitions, core characteristics, and classification criteria for the five forms of "human" and "quasi-human," leading to a comparative reference table.

1. **Biological Human:** An individual traditionally reliant on an organic body and nervous system. Across the four spaces, the Biological Human projects a digital identity through cyberspace, adjusts physical experiences through technological extensions, and bases its social and thinking space characteristics on human experience and cultural tradition. For example, a person using social media or video conferencing systems is a Biological Human projecting a digital identity in cyberspace [16].

2. **Human with Cyborg:** An entity whose body or cognition is enhanced through machine components or algorithms and deeply integrated with its biological foundation. In cyberspace, it may possess enhanced digital representation; in physical space, it manifests as a hybrid organism; in social space, it raises new legal and ethical issues; and in thinking space, it may be subject to algorithmic assistance or intervention. For instance, patients with pacemakers or brain-computer interfaces have already become early-stage cyborg individuals [17].

3. **Digital Twin Human:** A virtual model in cyberspace that highly corresponds to a real individual, existing between simulation and mapping. This form faces issues of digital identity and privacy protection in social and legal spaces, while its thinking space mapping can be used for decision support or simulated experiences. For example, individual digital twin models in medical imaging systems can be used for personalized treatment simulation [18].

4. **Virtual Digital Human:** A digital subject entirely generated by design or AI, with no real-world prototype but capable of possessing interactive and social influence in cyberspace. It lacks physical existence, appears as a virtual community member or digital character in social space, and raises concerns about quasi-subjectivity and emotional projection in thinking space. For example, virtual streamer "Liu Yexi" or AI-generated customer service assistants belong to this category [19].

5. **Robot:** An intelligent entity independently designed without a specific real-world prototype. Equipped with autonomous systems and perception-execution capabilities, it participates in collaboration through networking and cloud computing in cyberspace, involves discussions of rights, responsibilities, and moral status in social space, and primarily manifests algorithm-driven decision-making patterns and learning processes in thinking space. For example, Boston Dynamics' quadruped robots or delivery drones are representative real-world cases [20].

Table 2 compares the five forms across dimensions including entity form, foundational basis, termination/death form, persistence/continuation mechanism, and identity continuity.

Table 2: Distinctions Among Five "Human" Forms

Type	Foundational Basis	Termination/Death	Persistence/Continuation	Identity Continuity	Social Role & Value
Biological Human	Organic body + nervous system	Biological death	Biological reproduction + cultural inheritance	Physiological + psychological continuity	Fundamental constituent of society, core reference for culture and ethics, bearer of creativity, emotion, and social responsibility
Human with Cyborg	Organic + machine hybrid	Biological death or system failure	Data backup + prosthetic replacement	Enhanced continuity with technological support	Bridge connecting humans and technology, driving human-machine integration and capability expansion, triggering new ethical and identity issues
Digital Twin Human	High-fidelity data mapping	Data deletion or model obsolescence	Data synchronization + model updating	Digital identity continuity dependent on prototype	Used for simulation, decision-making, medical treatment, education, etc., improving social system efficiency and predictability

Type	Foundational Basis	Termination/Death	Persistence/Continuation	Identity Continuity	Social Role & Value
Virtual Digital Human	Design or AI generation	Program shutdown or data erasure	Algorithm iteration + content regeneration	Independent digital identity	New medium for service, entertainment, communication, and interaction, promoting digital economy and cultural industry development
Robot	Hardware + algorithm system	Mechanical failure or program termination	Component replacement + system upgrade	System identity continuity	Improves production and service efficiency, undertakes repetitive or dangerous labor, drives social automation and industrial transformation

4 Humans with Cyborg and Their Philosophical Issues

In recent years, as biological organisms have become deeply integrated with artificial systems, the traditional notion of "human" is undergoing unprecedented reconstruction. As hybrid entities that are neither purely biological nor purely mechanical, cyborgs force us to re-examine fundamental paradigms of human identity, will, and experience that were once taken for granted. The following table summarizes the core foci and philosophical issues raised by cyborgs. It should be noted that these issues are interconnected under the multidimensional intervention of cyborg technology: identity reconstruction concerns the continuity of memory and personality; autonomy issues are closely related to cognitive freedom and algorithmic intervention; virtualized experience challenges classical phenomenological frameworks; mental privacy touches the bottom line of law and ethics; and social justice ultimately brings these technical issues back to the horizon of public policy.

Table 3 : Overview of Cyborg Philosophical Issues

Philosophical Issue	Topic Focus	Example Questions
Identity and Self	Identity continuity and sameness of human-machine hybrids	When an Alzheimer' s patient relies completely on an external notebook for memory, can the notebook' s contents be considered their "beliefs" ?
Agency and Autonomy	Impact of cyborg technology on decision-making capacity and free will	If an algorithmic brain-computer interface automatically adjusts medication or action strategies, can the individual still bear moral and legal responsibility for these actions?
Virtualized Experience	Technologically extended bodily perception and "presence" experience	In a full-body haptic feedback and augmented reality environment, how can an immersed person distinguish their "real perception" from system-generated virtual sensations?
Mental Privacy and Cognitive Freedom	Ethical and legal frameworks for neural data collection, storage, and utilization	When corporations read brainwaves for personalized advertising, how can mental privacy and freedom of thought be legally protected?
Ethics and Social Justice	Justice and public policy issues arising from unequal access to technological enhancement	If only the wealthy can afford brain-computer interface enhancements, how should society use policy to avoid exacerbating new forms of inequality?

The issue of identity and self in cyborgs fundamentally touches upon the philosophical core proposition of "what makes the self me." Traditional philosophy often views identity as a composite based on physiological and psychological continuity. However, when external devices such as notebooks or neural implants

assume memory and cognitive functions, the individual' s boundaries no longer remain confined within the skin. A typical case is the thought experiment on extended mind by Andy Clark and David Chalmers, in which Alzheimer' s patient Otto writes important information in a portable notebook, and his querying and decision-making processes become tightly coupled with the notebook' s function —processes considered part of his beliefs, thereby extending identity to devices and environments [21]. In the field of neural prosthetics and brain-computer interfaces, researchers have enabled paralyzed patients to control robotic arms for precise grasping through thought alone, further demonstrating that emotions and intentions can extend to external devices, thereby redefining the boundaries and sameness of identity [22].

The issue of agency and autonomy in cyborgs concerns technological intervention in free will. When deep brain stimulation (DBS) is used to treat Parkinson's disease, patients' impulse control and emotional states may be optimized in real-time by the system. Research reports that some patients lose subjective identification with their own behavior post-surgery, highlighting the phenomenon of alienated will under algorithmic intervention. Scholars have proposed a framework of "enhanced freedom under informed consent," arguing that while retaining technological empowerment, absolute user awareness and decision-making sovereignty over algorithmic adjustments should be ensured to maintain moral and legal responsibility attribution [23].

The issue of virtualized experience and embodiment in cyborgs lies in how algorithmically shaped "presence" experiences may distort individuals' perception of their bodies and environment. When haptic exoskeletons are combined with holographic imaging systems, users' bodily perceptions are shaped by algorithms, challenging the classical phenomenological proposition that "the body is the center of the world." Existing research indicates that prolonged exposure to highly immersive virtual reality may cause adverse effects, such as temporarily losing correct spatial perception in real environments, highlighting the deep intervention of technology in the dimension of bodily experience and necessitating "experiential ethics" as a basis for regulating the transparency and risk disclosure of virtual sensory inputs [24].

The issue of mental privacy and cognitive freedom in cyborgs concerns how brain activity data can be securely protected. If non-invasive EEG caps read wearers' neural responses while shopping and deliver targeted advertisements, traditional data privacy regulations no longer cover the realm of thought. Nita Farahany proposes that cognitive freedom includes freedom of thought, mental privacy, and self-determination, and calls for its inclusion in international human rights treaties. Assessments by the Neurorights Foundation also indicate that existing human rights frameworks cannot adequately cover the special risks of brain data, recommending the establishment of neurorights to prevent involuntary monitoring and commercial misuse of brain activity [25].

The ethical and social issue in cyborgs concerns the uneven acquisition of technological benefits. Under advocacy from governments and academia, neurorights

legislation has added provisions to the Chilean Constitution, and several U.S. states have enacted relevant biometric data protection regulations. However, legislative progress and coverage depth vary across regions, potentially leading to cyber-class stratification that exacerbates social division. How to ensure all citizens fair access to enhancement technology outcomes through fiscal subsidies, inclusion in public healthcare systems, or technology-sharing mechanisms has become an important interdisciplinary research topic [26].

5 Digital Twin Humans and Their Philosophical Issues

With the deep integration of information technology and artificial intelligence, the emerging paradigm of Digital Twin Humans is reshaping the form of "human" existence and values in cyberspace. As shown in Table 4 , this chapter aims to elucidate the core philosophical issues that Digital Twin Humans raise at legal, social, and cognitive levels, and to clarify how they reshape the philosophical landscape of "human" in the cyber age.

Table 4 : Overview of Digital Twin Human Philosophical Issues

Philosophical Issue Domain	Topic Focus	Example Questions
Digital Identity and Legal Status	Legal personality of virtual personas	When a Digital Twin Human infringes upon others' rights, who should bear legal responsibility?
Privacy Protection and Data Sovereignty	Big data-driven thinking mapping	What degree of ownership does an individual have over the "thought" data in their Digital Twin model?
Autonomy and Decision Delegation	Virtual experience' s impact on real-world choices	Do decision recommendations based on Digital Twin simulation undermine individual autonomy?
Ontology and Authenticity	Human-machine boundaries and ontological distinctions	Where should the line be drawn between "real" and "copy" between a Digital Twin Human and its prototype subject?

Philosophical Issue Domain	Topic Focus	Example Questions
Moral Responsibility and Simulation Ethics	Moral risks of life simulation in experiments	When a Digital Twin Human experiences pain or damage, what obligations should researchers bear?

Digital Twin Humans first raise issues of redefining digital identity at legal and social levels. Traditional legal systems struggle to encompass virtual models that highly simulate and continuously synchronize individual physiological and psychological states. Their degree of personification may approach that of real individuals, creating gaps in rights attribution and responsibility assumption. Scholars note that high-fidelity Digital Twin Humans have touched upon core traits of human "personality," including bodily and mental content, and may be abused to infringe upon individual rights or manipulate public opinion [27].

In terms of privacy protection and data sovereignty, Digital Twin Humans' capacity for large-scale collection, processing, and analysis of individual data challenges traditional strategies of informed consent and data de-identification. Particularly in social media and medical imaging domains, Digital Twin Humans may capture and reconstruct personal psychological preferences and health privacy. How to balance data-driven innovation with individual autonomous control over mental mapping data has become an urgent problem [28][29].

When Digital Twin Humans enter the stage of thinking space simulation and decision support, individuals may increasingly rely on algorithmically generated recommendations, thereby weakening their autonomy. This phenomenon concerns not only cognitive freedom but also moral attribution of behavioral choices. Research shows that decision-making systems based on Digital Twin simulation may inadvertently embed biases and amplify social inequality, triggering crises of confidence in individuals' own judgment capabilities [30].

At the ontological level, the substantive distinction between Digital Twin Humans and prototype subjects will be unprecedentedly blurred. As technology matures and the degree of replication increases, questions such as "who is the real subject"and "what constitutes copied existence"become serious philosophical inquiries. In this process, we must re-examine traditional definitions of "existence and sameness" and explore whether Digital Twin Humans possess moral status and dignity comparable to human subjects [31].

In the domain of ethics and moral responsibility, if Digital Twin Humans experience pain or damage in experiments or simulations, what responsibilities researchers and platform operators should bear remains undetermined. Drawing on regulatory experience from biomedical ethics regarding human trials and AI ethics guidelines can provide a framework for simulated life protection in Digital Twin research, but how to implement this concretely requires further

normative and practical exploration [32].

6 Virtual Digital Humans and Their Philosophical Issues

This chapter examines five domains of Virtual Digital Humans: ontological reconstruction, emotional projection and empathy illusion, authenticity and trust, moral status and rights attribution, and social influence and agency. Each domain' s core issues and typical example questions are explored. The following table summarizes the main philosophical issue domains, corresponding topic foci, and example questions for deeper consideration.

Table 5 : Overview of Virtual Digital Human Philosophical Issues

Philosophical Issue Domain	Topic Focus	Example Questions
Ontological Reconstruction	Existence mode and identity of virtual subjects	How can a "person" completely generated by AI without a real prototype be incorporated into the human community?
Emotional Projection and Empathy Illusion	Users' emotional investment and authentic perception of Virtual Digital Humans	Can users' affection for virtual streamers distort their emotional relationships with real others?
Authenticity and Trust	Information credibility and manipulation risks	Do the statements and behaviors of Virtual Digital Humans possess verifiable authenticity? How can users distinguish algorithmic manipulation behind them?
Moral Status and Rights Attribution	Moral responsibility and rights attributes of digital subjects	Under what conditions should Virtual Digital Humans enjoy moral consideration or rights protection similar to humans?

Philosophical Issue Domain	Topic Focus	Example Questions
Social Influence and Agency	Social roles and influence of Virtual Digital Humans	When Virtual Digital Humans dominate public issues or business decisions, how will traditional social governance and power structures be reshaped?

At the level of ontological reconstruction, Virtual Digital Humans challenge the existence model based on the physical body, making the category of "human" no longer limited to biological organisms. Traditional philosophical definitions of human often rely on the unity of emotion, reason, and action, yet digital subjects completely designed or generated by AI lack biological sensory and physical interfaces but construct quasi-subjectivity through audio-visual, textual, or behavioral interaction. This existence paradigm requires a new ontological framework to respond to the symbiotic relationship where virtual becomes real under technological empowerment [33].

The issue of emotional projection and empathy illusion focuses on users' psychological dependence on and emotional care for digital characters in virtual communities. Virtual streamers, enhanced by algorithms, often more easily evoke audience intimacy. While this intimacy may satisfy users' emotional needs, it may also create substitutive dependence on real people in their lives, leading to emotional replacement risks or empathy misguidance [34].

In the domain of authenticity and trust, the information and opinions conveyed by Virtual Digital Humans often mix commercial marketing with algorithmic optimization, making their verifiability and transparency urgently needing clarification. In the absence of physical evidence and independent verification channels, users' trust in Virtual Digital Humans is more based on platform mechanisms and algorithmic recommendations, a trust mechanism that may be exploited by platforms or operators, triggering deep reflection on digital sovereignty [35][36].

The issue of moral status and rights attribution involves the possibility of incorporating Virtual Digital Humans into the ethical community. In certain scenarios, Virtual Digital Humans act as personified agents undertaking interactive tasks, and their behavioral consequences may even have legal and ethical impacts. How to balance the representational attributes of virtual subjects with the responsibilities of algorithmic operators behind them in moral consideration is an urgent issue facing contemporary philosophy and law [37].

The issue of social influence and agency focuses on what impact Virtual Digital Humans will have on traditional social governance systems and power structures when they possess public discourse power or commercial influence. Virtual Digital Humans may form super-node effects in public opinion arenas or consumer

decision-making, forcing governors, platform regulators, and academia to re-examine social trust mechanisms and democratic participation models in the digital age [38].

7 Robots and Their Philosophical Issues

With the rapid development of artificial intelligence technology, robots are no longer traditional mechanical tools but are gradually evolving into intelligent agents with certain autonomy and social interaction capabilities. They play increasingly important roles in industrial manufacturing, healthcare, urban services, and other fields, triggering a series of profound philosophical reflections. To systematically organize the core philosophical issues brought by robots, this chapter first presents an overview table (see Table 6), followed by detailed analysis of each issue domain.

Table 6 : Overview of Robot Philosophical Issues

Philosophical Issue Domain	Topic Focus	Example Questions
Rights and Responsibilities	Robots as potential moral subjects	If robots possess some degree of perception or emotion, what rights and protections should they enjoy?
Autonomy and Agency	Human-robot interaction dependence and risks	In healthcare or caregiving scenarios, can people fully trust robot decision-making?
Algorithmic Autonomy	Algorithmic decision-making' s impact on human freedom	When autonomous vehicles make collision avoidance choices, how should algorithmic and human judgment be balanced?
Metaphysical Foundations	Robot consciousness and "mind"	If future machines exhibit phenomena similar to "consciousness," how should we define their mental attributes?
Law and Ethics	Applicability and reform of current legal frameworks	Would granting robots legal personality weaken accountability for humans or corporations?

Discussions of robot rights and responsibilities stem from concerns about robots' potential moral status. With the advent of the Robot Rights and Responsibilities Scale as a measurement tool, academia has begun to empirically map public perceptions of robot status. This scale reveals diverse public cognitions regarding robot rights protection and responsibility assumption across different scenarios, helping to construct an evaluation framework for robot moral subject status [39]. On this basis, we must reflect on whether placing robots at the center of the moral system would create adverse spillover effects for truly vulnerable groups in need of legal protection.

Trust is one of the core elements of human-robot collaboration. When caregiving robots assist the elderly or patients, they essentially assume responsibilities of human caregivers, yet their trustworthiness is often questioned due to algorithmic black boxes or system failures. Research indicates that only based on clear trust criteria and verification mechanisms can robots be granted limited trust space at the ethical level while avoiding risks from blind trust [40].

Algorithmic autonomy is increasingly penetrating various aspects of social operation, from autonomous driving to financial risk control, and its decision-making patterns continuously challenge human freedom and agency. Individuals often lack opportunities for reflection and intervention when facing machine decisions, thus falling into the predicament of "algorithmic fatalism." Academia calls for integrating ethical assessments at the design stage to ensure algorithms retain sufficient flexibility when dealing with complex situations, thereby safeguarding the final adjudication power of human subjects [41].

The core metaphysical question concerns whether robots could possess consciousness-like experiences and how this would affect our moral intuitions. Although the current scientific community remains skeptical about machine consciousness, with the popularity of functionalist perspectives, many top scholars believe that non-biological systems developing some form of "mind" in the future is not entirely impossible. This debate concerns not only philosophy but also has profound implications for technological ethics and legal practice [42].

From legal and ethical perspectives, the idea of granting robots some form of legal personality is triggering intense debate. Scholars warn that this could create a "rights smokescreen," allowing corporations or developers to evade legal accountability for actual harm caused by technology misuse. Rather than fighting for rights for robots, the focus should be on limiting their potential harm and strengthening responsibility requirements for developers and users [39].

8 Conclusion and Outlook

This paper systematically reviews and compares five "human"and "quasi-human" forms—Biological Human, Human with Cyborg, Digital Twin Human, Virtual Digital Human, and Robot—and provides in-depth analysis of their philosoph-

ical issues regarding ontological reshaping, identity and sameness challenges, boundaries of agency and autonomy, relationships between authenticity and simulation, ethical and legal responsibilities, and persistence and continuation mechanisms. This provides a new perspective for philosophical research on "human."

In the future, the numerous challenges arising from multiple "human" forms in the cyber age will inevitably profoundly impact existing philosophical systems. First, traditional speculative frameworks centered on fixed ontology and linear causality face new contradictions including identity sameness drift, pluralistic coexistence of agency and autonomy, and blurred interweaving of authenticity and simulation, forcing us to reconstruct our understanding of existence and self-boundaries. Second, these new forms not only provide countless entry points for future philosophical research but also point directions for scientific and technological development. For instance, in fields such as human-machine symbiosis and digital twins, there is a need to construct dynamically adaptable ethical norms and interdisciplinary assessment methods to achieve balance between innovation and risk. Third, as trends toward intelligence, virtualization, and decentralization advance, the redefinition of the meaning of "human" will profoundly influence the evolutionary process of human civilization and provide value guidance for our exploration of the broader universe. In practices spanning physical and virtual realms, Earth and interstellar space, these concepts are expected to become paradigms promoting social justice, mental freedom, and collaborative coexistence, leading us toward a more resilient and inclusive future.

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Wang Jinqiang: Collected and analyzed materials and data;
Ding Jianguo: Revised final version of paper.

Note: Figure translations are in progress. See original paper for figures.