

# The Fourth Worldview of Humanity in the Digital Age—Cybersophy: Preliminary Conceptual Exploration and Framework Construction

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## Abstract

With the profound development of digital technology, humanity is facing comprehensive challenges to its cognitive frameworks, ethical systems, and value coordinates. This paper proposes for the first time “Cybersophy” as the “fourth perspective” following the traditional three perspectives (worldview, outlook on life, and values), aiming to provide a systematic cognitive-value framework for humanity in the digital age. First, based on the etymological combination of “Cyberspace” (also known as cyberspace) and “Sophia” (wisdom), a definition of Cybersophy is provided, and the dialectical relationship between Cybersophy and the traditional three perspectives is introduced. Next, the four core components of Cybersophy are elaborated, encompassing the cognitive dimension (human-machine collaborative cognition), the ethical dimension (algorithmic ethics, data justice, etc.), the ontological dimension (virtual-real integration), and the value dimension (value anchoring for individuals in the digital age), thereby constructing the theoretical framework of Cybersophy. Finally, the integration path between Cybersophy and engineering science is explored. This paper will provide a theoretical cornerstone for technological governance and human development in the era of digital civilization.

## Full Text

### Preamble

#### The Fourth Guiding Principle for Humanity in the Digital Age: An Initial Exploration and Framework Construction of Cybersophy

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**Abstract:** As digital technologies advance profoundly, humanity faces comprehensive challenges to its cognitive frameworks, ethical systems, and value coordinates. This paper introduces “Cybersophy” as the “Fourth Principle” following the traditional Three Principles (worldview, life outlook, values), aiming to provide a systematic cognitive-value framework for the digital age. First, based on the etymological fusion of “Cyberspace” and “Sophia,” we define Cybersophy and articulate its dialectical relationship with the traditional Three Principles. Next, we elaborate on four core dimensions of Cybersophy: the cognitive dimension (human-machine collaborative cognition), the ethical dimension (algorithmic ethics, data justice, etc.), the existential dimension (virtual-real integration), and the value dimension (value anchors for humans in the digital age), thereby constructing its theoretical framework. Finally, we explore pathways for integrating Cybersophy with engineering science. This work provides a theoretical cornerstone for technological governance and human development in the digital civilization era.

**Keywords:** Cyberspace; Cybersophy; Digital Age; Philosophy; Ethics

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## 2.1 Definition of Cybersophy

“Cybersophy” derives from the Greek roots “Cyber” (meaning “helmsman,” extended to “cybernetics” ) and “Sophia” (meaning “wisdom” ). This paper defines it as the fundamental perspective and systematic wisdom through which humanity understands its relationship with cyberspace and accordingly guides cognition, behavior, and value judgments in the digital age. It addresses fundamental questions such as “What is the essence of the digital world?” , “How do humans exist in the digital world?” , and “What constitutes good versus bad life in the digital era?”

## 2.2 Conceptual Evolution of Cybersophy

The proposal of Cybersophy did not emerge spontaneously but represents the cumulative crystallization and sublimation accompanying the evolution of digital civilization. Its conceptual development has roughly progressed through a logical sequence from technical foundations, phenomenon manifestation, disciplinary construction, methodology and critique, to worldview and values, and finally to practical wisdom.

At the technical level, Cybermatics focuses on underlying mechanisms such as network communication protocols, data formats, computational resource allocation, and intelligent agent interoperability. It establishes the “physical-information substrate” for the existence of cyberspace, providing the prerequisite for subsequent social and philosophical exploration.

As technology and society become deeply coupled, problem consciousness gradually emerges. This stage can be characterized as the phenomenon and problem

layer, exemplified by Cyber-Syndrome, which reveals digital pathologies such as information overload, privacy anxiety, algorithmic discrimination, and internet addiction. This makes humanity aware that while cyberspace is a neutral technological environment, it profoundly affects individual existence and social relationships.

Building upon this, academia began to explore cyberspace as a new research object, marking the emergence of a new disciplinary field—Cyberology. This stage emphasizes disciplinary systems, curriculum frameworks, and interdisciplinary research, pushing the exploration of cyberspace from scattered observations toward systematic investigation and initially manifesting the prototype of a meta-discipline.

At the methodology and critique layer, Cyber-Philosophy focuses on exploring ontological, epistemological, and ethical issues in cyberspace, such as the nature of virtual existence, the boundaries of human-machine symbiosis, and the possibility of digital justice. Cyberlogic, meanwhile, provides a formalized expression pathway for cyber philosophy, enabling philosophical problems to be transformed into logical systems that can be operationally addressed in science and engineering.

When philosophical criticality and reflexivity are further internalized into overall value orientations, we enter the worldview and values layer—Cyberism. Cyberism is concerned not only with how technology is possible but further with how technology ought to be, emphasizing the construction of new value anchors for the digital age centered on human agency, freedom, and dignity.

Finally, as value concepts gradually transform into practical principles, Cybersophy emerges as the crystallization of the wisdom and practice layer. Cybersophy inherits the philosophical height of Cyberism while emphasizing the unfolding of practical wisdom, focusing on providing actionable principles, strategies, and solutions, thereby becoming an action guide in digital civilization.

Cybersophy is the crystallization of this evolutionary process, representing the concretization of Cyberism at the level of practical wisdom, focused on providing executable principles, strategies, and solutions. It originates from technology but does not stop at technology; it responds to real problems yet ascends to a philosophical framework; it encompasses critical reflection while facing the generation of practical wisdom. This historical and logical evolution ensures that Cybersophy, as the “Fourth Principle of the Digital Age,” possesses both profound theoretical roots and practical operability and foresight.

### 2.3 Conceptual Delimitation

This paper proposes and adopts “Cybersophy” rather than alternatives such as “network-view,” “information-view,” “data-view,” or “intelligence-view” based on comprehensive consideration of the academic connotations, applicability, and limitations of different concepts. Cybersophy is not merely a replacement for

existing concepts but a new philosophical construction oriented toward the digital age. It aims to address existential, value, and wisdom issues in the context of deep human-machine coupling, provides a comparative analysis of several related concepts. The comparison reveals that “network-view” and “data-view” lean toward specific technical practice levels, while “information-view” and “intelligence-view” remain at abstract or single dimensions. In contrast, “Cybersophy” demonstrates greater systematicity and foresight in conceptual extension, philosophical depth, and future adaptability. Therefore, this paper establishes “Cybersophy” as the “Fourth Principle” of the digital age, serving as an important supplement and extension to the traditional Three Principles.

### 3 The Dialectical Relationship Between Cybersophy and the Traditional “Three Principles”

The proposal of Cybersophy does not intend to replace or negate the traditional “Three Principles” (worldview, life outlook, values). Rather, it represents a necessary expansion and important supplement to them, grounded in the historical context of digital civilization. The Three Principles, formed in agricultural and industrial civilizations, primarily address the relationships between humans and nature, society, and the inner world, providing fundamental cognitive and value coordinates. However, as digital technologies, intelligent systems, and virtual spaces emerge, the space of human existence has transformed: the fusion of virtual and real, and the reordering dominated by information and algorithms, have created gaps in the explanatory and guiding power of traditional frameworks. Cybersophy is precisely proposed to fill this gap, becoming the “Fourth Principle” for humanity to address digital age challenges.

From a dialectical perspective, Cybersophy and the Three Principles exhibit a dual relationship of both inheritance and transcendence. On one hand, Cybersophy takes the Three Principles as its value foundation and humanistic root, absorbing classical wisdom about relationships among nature, society, and self. On the other hand, Cybersophy responds to fundamental questions unaddressed by traditional frameworks, such as “What is the essence of the digital world?” , “How can humans and machines coexist?” , and “Wherein lies digital value?” As shown in , this relationship can be analyzed across four dimensions: core relationship, core questions, field of practice, and mutual influence.

Thus, Cybersophy is not an isolated theoretical construction but works together with the Three Principles to form a more comprehensive human cognitive-value system. In this system, the traditional Three Principles provide the ethical and humanistic foundation for Cybersophy, while Cybersophy extends and renews the connotations of the Three Principles within the digital living environment. The two form a dynamic, complementary relationship, reflecting the dialectical evolution of human cognitive structures in the digital civilization era. In other words, Cybersophy reveals that beyond physical-social-psychological space, humanity must confront cyberspace as a new existential space to construct a complete ontological and axiological framework. It is both the digital sequel to

the Three Principles and the internal driving force for their self-transcendence and renewal. Ultimately, Cybersophy and the Three Principles jointly provide a more integrated and forward-looking cognitive and value coordinate system for the digital age, guiding humanity toward meaningful development and self-realization in complex virtual-real fusion environments.

## 4 Core Content of Cybersophy

Cybersophy is a three-dimensional theoretical framework designed to systematically address the fundamental challenges facing humanity in the digital age. It comprises four interrelated and progressively deepening core dimensions: the cognitive, ethical, existential, and value dimensions, which together form a complete cognitive-value system. To more intuitively present this theoretical framework, systematically summarizes the internal logic of these four core dimensions.

### 4.1 Cognitive Dimension

In the digital age, human cognitive processes are no longer confined to internal activities of the biological brain but are deeply coupled with intelligent technologies, exhibiting novel characteristics. The cognitive dimension of Cybersophy aims to extend the traditional paradigm of “individual mind” cognition to a framework of “human-machine collaborative distributed cognition.”

First, the extension and reconstruction of cognition constitute the foundation of this dimension. Cloud computing, search engines, and large AI models have become external extensions of human memory, computation, and reasoning capabilities. Cognitive activities are no longer isolated but occur and develop distributively within complex systems composed of “human-intelligent device-network.” This transformation demands that we deeply understand and master the new paradigm of human-machine fusion intelligence, while also signifying that humanity’s fundamental living space has expanded from the traditional physical-social-thinking space to a four-dimensional space that includes cyberspace—the “Cyber-Physical-Social-Thinking Space (CPST)” [14].

Furthermore, cultivating critical digital thinking has become crucial in confronting problems such as the information cocoon effect created by recommendation systems and information pollution caused by deepfake technology [15]. This mode of thinking transcends basic technical literacy, requiring individuals to understand the fundamental logic of algorithmic operations, possess the ability to identify false information and detect cognitive manipulation, and actively break through cognitive barriers to maintain cognitive autonomy in information-overloaded environments. The absence of such thinking constitutes one important cause of Cyber-Syndrome.

Additionally, all interactions and existences in virtual space essentially involve the creation and interpretation of cyber-symbols or digital language. From social media emojis to virtual avatars and digital artworks in the metaverse, new symbolic systems and communication contexts have emerged. Therefore,

the cognitive dimension of Cybersophy requires people to cultivate the ability to understand, utilize, and even create meanings for these virtual symbols, to switch freely among different symbolic systems and virtual contexts, and to master basic knowledge and application skills of cyberlogic to achieve efficient and seamless virtual-real integration.

#### 4.2 Ethical Dimension

Technology is not value-neutral in its design and application contexts, as they embody specific ethical orientations. The ethical dimension of Cybersophy aims to establish a new ethical order of fairness, justice, and goodness for human-machine symbiotic digital environments, with core issues including algorithmic justice, data rights, and technology for good.

Algorithmic justice is a central concern. Algorithmic decision-making has been widely applied in credit approval, judicial sentencing, personnel recruitment, and other scenarios, yet its opaque operational mechanisms may solidify or even amplify existing social biases, leading to algorithmic tyranny [16]. Therefore, Cybersophy advocates promoting transparency, explainability, fairness, and accountability mechanisms to ensure that algorithmic decision-making processes are auditable, results traceable, and biases correctable, thereby guaranteeing compliance with moral and legal requirements.

Data rights and privacy protection constitute a crucial aspect of human rights in the digital age. As the essential energy of the digital economy, data ownership and usage norms urgently need clarification. Cybersophy asserts that individuals' ownership, control, and benefit rights over their personal data must be legally and technically defined, with firm opposition to data exploitation and misuse. Meanwhile, privacy protection should not be understood as complete seclusion but as autonomous decisions about the scope and extent to which information is known by others under security guarantees.

All technological ethics discussions should be oriented toward the goal of technology for good [17]. This requires the engineering community to prospectively assess potential socio-ethical risks at the initial stage of technology research and development and to embed ethical considerations throughout the entire technology lifecycle through methods such as value-sensitive design, guiding technology toward directions that enhance common human interests.

#### 4.3 Existential Dimension

The existential dimension of Cybersophy aims to re-examine technology's fundamental role in human "being," exploring questions of "what is human" and "how should humans conduct themselves" in digital environments, while advocating a living space and state of "deep integration of virtual and physical."

Digital identity represents a novel existential issue [18]. In cyberspace, individuals can construct multiple distinct digital identities based on different social

platforms and communities. These identities are no longer simple copies or projections of real identity but important means for individuals to express themselves and engage in social interaction in specific contexts, deeply participating in the fluid construction of the “self.” Cybersophy maintains that a healthy digital existence should pursue coherence and integration between virtual and real identities to avoid self-cognitive dissonance caused by excessive identity fragmentation.

Moreover, embodied interaction is becoming a new mode of human-computer interaction [19][20]. With the development of virtual reality (VR), augmented reality (AR), and brain-computer interface (BCI) technologies, human interaction with the digital world is shifting from traditional “disembodied” modes (e.g., keyboard, mouse) to “embodied” modes. Technology is increasingly integrated into our bodily perception and experience, becoming a new organ through which we perceive the world and express ourselves. This trend of human-machine fusion is fundamentally reshaping our existential experience. However, such interaction also raises concerns, as extensive psychological and sociological research demonstrates that experiences in virtual worlds (such as social interaction, achievement, conflict) can evoke equally real emotional reactions [21][22] and social effects as in the physical world. Therefore, the ethical severity and harm to individuals caused by behaviors such as cyberbullying [23], digital fraud, and virtual harassment in virtual worlds should not be neglected or underestimated due to their virtual environment; corresponding ethical norms and governance mechanisms must be established for effective regulation.

#### 4.4 Value Dimension

Facing the continuous emergence of new technologies, humanity’ s traditional values have been profoundly impacted. The value dimension of Cybersophy aims to find new value coordinates for humans in the digital age, ensuring that technological development serves human flourishing.

Digital-age humanism constitutes the core cornerstone [24]. Cybersophy reasserts that human agency, dignity, and value are the supreme criteria for measuring all digital technology development. The design and application of any technology should fundamentally aim to enhance rather than weaken human capabilities, expand rather than restrict human action, and serve rather than dominate human development. We must guard against tendencies to instrumentalize and datafy humans, defending humanity’ s central position in the digital age.

In the “always-on” digital culture, information overload, technology addiction, and digital burnout have become widespread Cyber-Syndromes [4]. Cybersophy advocates that individuals should actively and wisely manage their relationship with digital devices, pursue healthy digital usage while enjoying technological convenience, and prevent excessive immersion through mindful usage and digital fasting to achieve personal physical and mental well-being.

Cultivating global digital citizenship consciousness is an inevitable requirement for addressing global challenges. Issues such as cybercrime, data security, algorithmic bias, digital divide, and AI's environmental costs have become global challenges that no single nation can address alone [10][25]. Therefore, we must cultivate global digital citizenship consciousness that transcends geography, race, and culture, advocate for open, inclusive, shared, and equal digital civilization concepts, and jointly build a community with a shared future in cyberspace.

#### **4.5 Research Framework of Cybersophy**

Based on the four dimensions of Cybersophy discussed above, this paper constructs a multi-level research framework to provide a clear roadmap for subsequent academic exploration and theoretical deepening. This framework aims to transform abstract philosophical speculation into operational and testable research agendas, with specific content shown in .

### **5 Integration Pathways Between Cybersophy and Engineering Practice**

Engineering science, as the direct force constructing the digital world, fundamentally shapes the form and order of cyberspace through its development direction and practical paradigms. Therefore, translating Cybersophy's philosophical concepts into internal principles of engineering practice is central to avoiding technological alienation and achieving responsible innovation. This requires the engineering field to shift from pure functional implementationism to a more ambitious value constructivism that consciously assumes ethical and social responsibility. Cybersophy is not abstract speculation detached from engineering practice but practical wisdom that can provide a value compass and methodological innovation for it. Its integration pathways manifest primarily in three levels: value-sensitive design and methodological innovation, algorithmic governance and ethical practice, and forward-looking guidance for future engineering research agendas.

#### **5.1 Value-Sensitive Design and Methodological Innovation**

Traditional engineering design paradigms often prioritize technical feasibility and functional optimization, with considerations of ethical values and social impact frequently lagging behind technological maturation in a passive “problem-fixing” mode. Cybersophy demands a fundamental paradigm shift from the source, advocating value-sensitive design [26] that prospectively incorporates ethical values embedded in Cybersophy—such as privacy, fairness, autonomy, and well-being—as core design constraints and optimization objectives from the initial stages of system design and development, systematically translating them into specific technical specifications and architectural choices. For example, when designing facial recognition systems, engineers should not merely pursue

recognition accuracy but must embed the value principle of “privacy protection” throughout the entire process of data collection, model training, and application deployment by introducing privacy-enhancing technologies such as differential privacy and federated learning, achieving a shift from “post-hoc remedy” to “source prevention.”

To achieve this goal, engineering methodology also requires improvement. First is implementing participatory design strategies that involve stakeholders potentially affected by technology—such as ordinary users, community representatives, ethicists, and social scientists—from the conceptual stage onward. This early participation ensures that technical solutions more adequately address complex social demands and value concerns. Additionally, constructing multidisciplinary teams is necessary, encouraging engineering project teams to incorporate members with strong humanities and social science backgrounds, such as ethicists, psychologists, and sociologists. Such interdisciplinary teams can collaboratively conduct application development and social impact assessment, driving an engineering paradigm shift from designing for function to designing for human values and social impact.

## 5.2 Algorithmic Governance and Ethical Practice

Algorithms function as “helmsmen” in the digital world, influencing information flow, resource allocation, and even individual decision-making, making effective ethical governance crucial. The ethical dimension of Cybersophy provides a clear framework for algorithmic governance. The primary task is establishing and mandating algorithmic impact assessment systems [27]. Any algorithmic system that may significantly impact the public, especially in high-risk domains such as public administration, judiciary, finance, and healthcare, must undergo systematic assessment before deployment, with detailed analysis, public disclosure, and formulation of avoidance and rectification plans regarding potential fairness and privacy issues.

Furthermore, to reduce the “algorithmic black box” phenomenon, enhance algorithmic transparency, and ensure safety, the industry must adopt explainable AI technologies [28]. Particularly in scenarios concerning individual rights and well-being, algorithmic decision logic must be presented in human-understandable ways to ensure the feasibility of reviewing algorithmic decision-making processes, which constitutes the technical prerequisite for guaranteeing procedural justice and outcome fairness. Building upon transparency, establishing independent ethical auditing and accountability mechanisms [29] is also imperative. This mechanism introduces third-party auditors to conduct rigorous testing and review of deployed algorithmic systems regularly, detecting whether algorithms produce bias, discrimination, or other unintended harmful consequences in the real world, and clarifying accountability subjects and pathways to ensure algorithmic operations remain under effective supervision.

### 5.3 Future Directions

Clarifying the definition and connotations of Cybersophy can not only provide important guidance for engineering practice but also direct the future development of engineering scientific research.

First, research on digital mental-state modulation technologies for digital well-being. Targeting Cyber-Syndromes such as digital addiction, information overload, and technological burnout [4][30], we should develop technical tools that help users maintain digital health and achieve inner harmony. Such research will materialize the value dimension of Cybersophy, helping humanity truly achieve physical-mental well-being and individual freedom in the digital world.

Second, interdisciplinary integration of cyborg ethics and enhancement limits. With the emergence of advanced technologies such as brain-computer interfaces, gene editing, and human enhancement, challenges of “post-human, carbon-silicon hybrid life” have arisen [31]. This requires the engineering science community to maintain close collaboration with ethics, law, and other fields to jointly explore the developmental boundaries and ethical red lines of human enhancement technologies, establishing reasonable boundaries for therapeutic enhancement while prohibiting non-therapeutic enhancements that may trigger massive social injustice, thereby formulating ethical guidelines and industry standards for technology R&D and application.

Third, research on engineering ethics framework construction for the metaverse. As an advanced form of virtual-real fusion, the metaverse should evolve into an open, inclusive virtual world rather than one monopolized by a few giants, with complex ethical challenges at every architectural level from underlying protocols to upper-layer applications [32][33]. We must consider ethical issues in all aspects of metaverse architecture and systematically implement the cognitive, ethical, existential, and value dimensions of Cybersophy, thereby shaping a more promising future digital ecosystem from the source.

## Conclusion

To address the cognitive and ethical challenges facing humanity in the digital age, this paper proposes and elaborates Cybersophy as the fourth principle following worldview, life outlook, and values. Cybersophy is defined as the fundamental perspective and systematic wisdom through which humanity understands its relationship with cyberspace and guides cognition, behavior, and value judgments accordingly. This paper constructs a theoretical framework for Cybersophy and explains its connotations across four dimensions: cognitive, ethical, existential, and value. Cybersophy does not replace the traditional Three Principles but represents a necessary philosophical expansion for human existence in the digital age, providing cognitive coordinates for understanding, critiquing, and shaping digital civilization. For engineering practice, embracing Cybersophy means actively embedding ethical values throughout the entire application development process, thereby advancing toward the goal of technology for good.

Looking ahead, the practice of Cybersophy requires the joint participation of scientists, engineers, philosophers, sociologists, and the public. Just as philosophy guides our lives in the physical world and anthropology guides our lives in the social world, we now need Cybersophy to guide our lives in the digital world. This is a systematic framework for enhancing human wisdom, ethics, and knowledge in the age of cyberspace and artificial intelligence. Only through interdisciplinary collaborative efforts can humanity effectively harness emerging technologies and jointly advance toward a new era of digital civilization characterized by human-machine harmony and virtual-real mutual promotion.

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