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The World of Dual-Brain

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Preface

Change

Everything in the universe is unpredictable all the time.

They, whether organic or inorganic, are changeable and changing constantly.

"Nature consists of the inanimate physical world, the animate biological world, and the spiritual world of humans. There is the integration of many aspects, such as an object, energy, structure, function, information, movement, in the inanimate physical world; the integration consists of many aspects such as living organisms, energy, structure, function, information, vital movements, and biological evolution in the biological world full of lives; and the integration of perception, memory, thinking, intelligence, emotion, and consciousness in the mental activities". "The physical world, the biological world, and the spiritual world are not separated from each other but connected and integrated", Tang Xiaowei.[1]

Metaphysical and physical changes and invariants constantly occur in the physical, biological, and spiritual worlds.

The rapid development of intelligent high-tech technology, especially the rapid integration of ICT (Information and Communication Technology) and AI, promotes the systematic and integrated integration of intelligent technology and human knowledge, gradually presenting the borderless "wisdom sharing", which triggers the transformation of human society integration.

Mobile phones stepped to transform from analogue communication to digital communication in 2008, which caused me to think about the social changes brought about by the development of science and technology and set out for the *Off-site Economy Supported by Mobile Smart Terminals*, where concepts such as "wisdom sharing", "wisdom sharing system" and "off-site economy" were put forward for the first time. This book was expanded from a paper of mine in 2008. However, it is imperfect in content, structure, and logic due to the limitation, such as the insufficient development of intelligent technology at that time (while analogue phones were still

[1] Tang Xiaowei, Editor-in-Chief, "Research on General Integration Theory (Part II): Principles and Methods of General Integration Theory" Hangzhou: Zhejiang University Press, 2017.

dominant, smartphones were rudimentary), my lack of knowledge, immature writing skills. However, the book captures the critical outcomes of high-tech development: (1) Trend: The formation and evolution of online wisdom sharing system; (2) The off-site direction of all social activities.

The book was condensed and revised into *Off-site Economic Awareness*[2] in 2015. I finished *The Sociality Brain-The Formation and Evolution of Wisdom Sharing System*[3] based on *Off-site Economic Awareness* in 2017, the 120th anniversary of Zhejiang University, to further explore the integration of the physical world, biological world, and spiritual world in a new historical environment, and expound "Wisdom Sharing System" and "Learning from the Brain",[4] the core of off-site economic development.

The Sociality Brain-The Formation and Evolution of Wisdom Sharing System describe the formation and evolution pathway of wisdom sharing system and emphasise that: Firstly, the integrated development of science and technology has changed the environment of distributed cognition, and data-based knowledge and tasks obtain a brand-new borderless distribution environment through the wisdom sharing system; Secondly, the specific conditions of the emergence of this new environment are constantly changing due to the change of distributed environment and the intervention and participation of multi-agents. After processing special agents and the massive calculation, comparison, error correction, and re-calculation of supercomputers, output that the original distributor hadn't anticipated emerged continuously-new data that didn't exist originally. The latest data carries brand-new information and knowledge, which we call machine knowledge (or dark knowledge called by some scholars). It is a brand-new human-machine hybrid knowledge system, including integrating and sharing knowledge about natural persons and algorithms.

It needs to be pointed out that machine knowledge refers not only to the result produced by a single machine, an algorithm, or a single agent but also to the integration of large-scale machine self-learning or the assistance of multi-agents, thus giving birth to a human-computer hybrid knowledge system which is different from the natural person knowledge system. Its continuous growth enables many weak AI bodies to integrate and cooperate here. The self-learning and emergent functions of the wisdom sharing system enter a new advanced stage with increasing speed, enabling the emergence of brain-inspired phenomena. Thus, the advanced stage of the wisdom sharing system arrives-The Sociality Brain is born.

It is a wisdom sharing system in an advanced stage shared by intelligent machines and natural persons, called the "Sociality Brain".

The brain-inspired phenomenon refers to the whole wisdom phenomenon of human-machine reflected by the wisdom sharing system, which is different from

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[2] Weizhi Zhang, *Off-site Economic Awareness*, Hangzhou: Zhejiang University Press, 2016.

[3] Weizhi Zhang, *The Sociality Brain-The Formation and Evolution of Wisdom Sharing System*, Hangzhou: Zhejiang University Press, 2017.

[4] Tang Xiaowei, *Learning from the Brain-General Integration Theory*, Hangzhou: Zhejiang University Press, 2016.

the research on a single agent or individual brain (technically). The latter's achievement, the agent, will eventually be integrated into the wisdom sharing system to show the overall wisdom of human-machine collaboration.

The Sociality Brain-The Formation and Evolution of Wisdom Sharing System explore the wisdom sharing system's formation and evolution mechanism by observing the hybrid development of the human-machine knowledge system. The book also predicts the presupposition of the Sociality Brain. It explores the relationship between the new collective consciousness and free will in the community of Sociality Brain by analysing the high dependence of human-machine on Sociality Brain. It is expected that the reconstruction of off-site social order and economic order can be found, finally.

Since its publication, the book has aroused attention and discussion from all walks of life. Some readers think that I am a prudent optimist. Guarded optimism stems from mechanism analysis and sensitive response. However, academic circles also have many criticisms that the formulation of 'Sociality Brain" is only a metaphor, especially the lack of the internal theoretical exposition and demonstration of the formation of human-computer hybrid knowledge system and ethics in the book.

The feedback sent me back into more profound meditation.

Is the Sociality Brain, an advanced stage of wisdom sharing system, just a metaphor? Is brain-computer combination (direct combination of brain and computer) regarded as dual-brain? What exactly is Dual-Brain's other brain?

New questions have emerged in my mind facing the significant development of intelligent technology and the changes in social structure: We will have to face the increasingly advanced AI technology and machine knowledge system.

While I was thinking hard about them, some phased achievements were achieved from our TEGGS experiment (i.e. the International Trade Electronic General Service Platform, an applied research topic of AI technology and computer legal interpretation technology in the paperless field of international trade, belonging to the applied research category of legal informatics, which will be introduced and discussed in subsequent chapters). This topic involves the linkage experimental environment of multinational ports, far beyond the observed climate of Edwin Hutchins ships and ports in that year (see Chap. 1). In addition, the sharing system in the TEGGS experiment is directly involved in the translation action of multiple artificial intelligence agents and the direct decision-making behaviour of the system. The real trouble arises: the direct intervention of non-human artifacts and the universal nature of human beings brought me the deep dependence of Dual-Brain governance responsibility penetration and Sociality Brain.

Inspiration by the TEGGS experiment enables us to be aware that the intelligent machine or agent will step its show of overall high intelligence function through this wisdom sharing system and gradually become one of the essential participants in social activities without the necessity of waiting for the day when a single strong AI is born.

Therefore, a brand-new Dual-Brain coexisting with the human brain and Sociality Brain will be ushered in.

In addition, it raises more profound questions: Will the Sociality Brain kidnap us? Where should we think on AI governance steps first, jurisprudence or philosophy? What kind of human-computer ecological order will Dual-Brain be? Is there a "Mind-inspired" phenomenon in the Sociality Brain? Should our thinking on AI governance be based on jurisprudence or philosophy first? ...

I decided on reflection to try again, that is, to work on *The World of Dual-Brain* from the perspective of philosophy of science, based on *The Sociality Brain-The Formation and Evolution of Wisdom Sharing System.*

It can be found from the research on social changes caused by the development of intelligent technology that most experts in various countries adopt the observation pathway of technology itself, technology governance, or the combination of technology and legal system. However, technological administration has encountered the problem that the uncertainty of multi-agent collaboration has surged in the era when scientific and technological progress and integration develops. These new problems and phenomena can no longer be entirely solved by the existing pure technical governance thinking, traditional cognitive science, or social science theories (pragmatism theory, embodied cognition theory, communication theory, distributed cognition, and actor-network).

Many aspects of social development have confirmed the existence of the trend towards an Off-site Economy supported by mobile intelligent terminals" and the reality of Sociality Brain since 2008. The prevailing fact that "without mobile phones, our life will be troublesome, and our souls will be siphoned away" also confirms that the wisdom sharing system is developing and growing.

After some thinking, I decided to try again. Trying to build on the writing of *The Sociality Brain-The Formation and Evolution of Wisdom Sharing System*, and then compile the book *The World of Dual-Brain* with a perspective on philosophy of science. The arrival of the coexistence of the Sociality Brain and the human brain is the inevitable result of the continuous integration and optimisation of the physical world, biological world, and spiritual world.

This evolution is a process in which human beings re-recognize the world and themselves, which is not only the evolution of the natural person's mind, the continuous reshaping of the concept of the human-machine community but also the process of emergence of human-machine symbiotic mind-inspired emergence and the subsequent evolution of new order.

In essence, this is the adaptation of natural persons to the change of the relationships among all things in the world.

In this sense, *The World of Dual-Brain* is the redevelopment of human cognitive theory and order theory and a breakthrough in traditional theory and ideology, primarily a breakthrough in the bondage of instrumental rationality ideology and pure biological brain-mind cognitive theory. I hope it will provide new thinking, a new method, and a new pathway for promoting the upcoming human-machine harmony and further developing the global economy.

It is expected that *The World of Dual-Brain* will jump out of the human society and the long-standing thinking inertia and provide a brand-new skylight for thinking about the structure and order governance reform of the intelligent social economy.

Only the significant development of high-tech (especially intelligent technology) will continuously expand the cognitive boundary of natural persons, which is the exact way to overcome the inherent shortcomings of natural persons constantly; Only by overcoming the deficiency of natural person's interest trend nature can we always be in the dominant position of human-machine symbiosis world.

Off-site Economic Awareness, the Sociality Brain-The Formation and Evolution of Wisdom Sharing System and The World of Dual-Brain are related and progressive: (1) it is predicted by observing the development of high-tech that the main form of social activities dominated by scene will gradually turn to off-site; (2) it is found by observing the development of high-tech integration that the wisdom sharing system is taking shape, which promotes the acceleration of off-site (the content of *Off-site Economic Awareness*). (3) through the observation on the wisdom sharing system, it is found that the intervention of agents changes the specific conditions for the emergence of the wisdom sharing system, which enables some brain-inspired functions to appear in the system, and evolves into the Sociality Brain with brain-inspired functions, gradually (the content of *The Sociality Brain*). (4) it is found via the further focus on the structure and intelligent ethics of Sociality Brain that Sociality Brain will be the key of all parties' dispute (including human and machine). How to ensure the healthy development of the Sociality Brain? (5) it is found by observing the phenomenon of Mind-inspired in Sociality Brain that the key to the harmonious governance of human-machine symbiosis is to protect Sociality Brain, and more importantly, to cultivate healthy mind-inspired through Sociality Brain (the content of *The World of Dual-Brain*).

As for *The World of Dual-Brain*, I try to eliminate the previous puzzle of communication theory explanation between individual and individual, individual and group, and group and group in combination with the development of science and technology and philosophy. Then, I stride into a new world in which human interactions with AI agents, guided by cognitive expansion, ethical observation, and changes in human-machine order governance. It is hoped to be concluded that the whole world unites to accelerate the development of intelligent high-tech technology, re-evaluate the variables of relationships among scientism, humanism, globalism, and nativism, and quickly cross the essential critical point of decoupling technological development from regional interests, which is the beginning of human-machine harmony. The parallel here is the process of unfettered self-contemplation.

Concepts such as "Wisdom Sharing System", "The Sociality Brain", "The World of Dual-Brain" and "Off-site Economic Civilization", especially the viewpoints such as "Basic Contradiction of Intelligent World", "Class Analysis and Division in the World of Dual-Brain" and "Mind-inspired" put forward for the first time in the book, maybe accompanied by an imperfection in academic concepts or demonstration process.

I don't know how many greater criticisms will come from academic circles, especially the logical intellectual inertia of "emphasising argumentation over thinking" generally exists in philosophical circles. What I can do is to satisfy the balance of specification and argumentation as much as possible.

This new philosophical thinking transcends the natural person, society, and biological brain category. Even though it is seriously lacking in depth and argumentation, I firmly believe that: In this critical period of human development, an open mind is required to grasp the central vein of the evolutionary integration of the physical, biological and spiritual worlds and the continuous self-reinvention and evolution of human beings, to adequately capture the innovative cultural features of the off-site universal sharing, and to provide theoretical support for the upcoming community of human destiny in the age of intelligence.

Then, this is still a very historically positive discourse, even if it is mercilessly criticised.

Hangzhou, China
September 2020

Weizhi Zhang[5]

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Acknowledgements

As seasons run, it is time for artificial intelligence.

At first, I was concerned about something when trying to carry out interdisciplinary research with a philosophical perspective. The key is that I was at a loss and knew nothing where to start facing the mysterious and magnificent intelligent world because of my lack of sufficient understanding of intelligent technology and the Philosophy of Science and Technology. Encouraged and helped by various circles, it was decided that tentative research on the off-site economy and the world of Dual-Brain would be carried out, starting with the philosophy of science and technology.

Sincerely, I lament the importance of continuous learning and re-learning now. It is life-oriented and social, which continues encouragement and support from relatives and friends instead of isolated self-learning.

A million of support and help was received from my tutors, leaders, colleagues, students, and various sectors, such as Zhejiang University, University of Hawaii, Peking University, Zhejiang Normal University, East China University of Political Science and Law, University of Luxembourg, United Nations International Trade Centre, Zhejiang University Press, government departments and industry associations since my presentation to research ideas of "Off-site Economy supported by mobile terminals" and "Wisdom Sharing System" in 2008. Especially, I was supported powerfully by Hu Zhenyu, a doctoral supervisor of Zhejiang University, and other leaders in Zhejiang University when it was just a hazy and immature idea. Zhejiang University initiated Zhejiang University Innovation Institute and the first particular research institute (Yuanzheng Mobile Intelligence Research Institute of Zhejiang University), I was honoured to be the first director. Since then, the research on the Off-site Economy and Wisdom Sharing System has officially has been started. This research has been encouraged and supported by Prof. Chung-Ying Cheng and Prof. Roger T. Ames from the Department of Philosophy, the University of Hawaii, Academician Tang Xiaowei, Vice President Luo Weidong and Prof. Sheng Xiaoming from Zhejiang University. Later, I was given long-term guidance and help in Philosophy of Science and Cognitive Science by teachers from the School of Philosophy, Zhejiang University, such as Prof. Sheng Xiaoming, Prof. Li Hengwei,

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Their help and encouragement supported me to master the knowledge in different disciplines and explore the human and machine symbiotic order so that we can usher in the publication of *The World of Dual-Brain.*

Thanks to my family, friends, colleagues, industry professionals, and various organisations and institutions (including the publishing house) who care and support me.

Hangzhou, China Weizhi Zhang
October 2021

Outline

Disillusionment and sobriety, kidnapping and escape.

How do realize the harmonious coexistence of humans and machines in the Dual-Brain world of wisdom sharing?

The World of Dual-Brain, consisting of two parts (eight chapters), carries out exploratory thinking on human-machine symbiosis world cognition, human-machine ethics, and the Dual-Brain world justice.

Part I, Due to Cognition, consisting of Chaps. 1–4, expounds the author's self-cognition about the development of intelligent technology and the intelligent world.

Chapter 1 Cognitive Challenge. The development of intelligent science and technology has caused us to think about the logical, conceptual, or theoretical changes of the creators, users, service objects, and relations of engineering and technology, which force us to return to the cognitive perspective of the development of science and technology and the redevelopment of human society for re-examination.

Chapter 2 The Birth of Human-Machine Knowledge. How can human beings improve their overall cognitive ability through a human-machine hybrid mechanism while using their cognitive ability? Where should we find an explanation for human-machine hybrid cognitive achievement?

Chapter 3 The Kidnapping of Dual-Brain. It can be found from all kinds of traditional cognitive theories that they focus on the human "mind" and "brain", which are stuck in the cognitive activities and cognitive processes formed in the brains of biological individuals. why is there only one way to unfold the "mind" of the biological person?

Chapter 4 Protect the Sociality Brain. The Dual-Brain world reestablishes the essential relationship between the life of one biological person and that of another, AI agent and the physical world, the biological world, and the spiritual world. Humans begin to fully experience, understand and practice social relationships and brand-new social responsibility with the new world.

Part II Symbiotic Order, consisting of Chaps. 5–8, expounds the author's thinking on the construction and governance of human-machine symbiosis order and re-self-cognition of off-site economic awareness.

Chapter 5 Class Division. Biological individuals and their organizations (including governments and super technology companies) become tools of intelligent tools. It is not desirable. New questions arise in the development of philosophy, which enables it to be more necessary to advance towards the ontological new cognition about human-machine symbiosis environment.

Chapter 6 The Nonhuman Order with Humanity. When an intelligent body (machine knowledge system) is no longer an object in the traditional sense of an artefact and is no longer a product of science fiction, discursive and imagination, but an artefact endowed with personalized and autonomous wisdom, then many major theoretical issues such as the original social foundation theory and normative order will face a breakthrough.

Chapter 7 Escape from Kidnapping. Only a small number of biological persons who remain unique souls have escaped the kidnapping of the Sociality Brain preference and self-awareness.

Chapter 8 Building a Mind-inspired Society. Off-site economic awareness belongs to the Sociality Brain mind-inspired in the Dual-Brain world and the awareness of comprehension and exploring of new hierarchical governance in human-machine symbiosis society. It is essentially the separation of the truth, goodness, and beauty of the biological person from their greedy and ferocious nature. The truth, goodness, and beauty of human beings will evolve freely and we usher the "Off-site Economy"[6] civilization of the Dual-Brain world.

[6] Weizhi Zhang (2016), Off-site Economic Awareness, Hangzhou: Zhejiang University Press.

Contents

1 Prolegomenon 1
1.1 Cognition Differences and Pragmatic Action Effects 2
1.2 Mind-Inspired and Responsibility Penetration Blocking of Sociality Brain 8
1.3 Liberation of Ideology and Human-Machine Symbiosis Community 13

Part I Due to Cognition

2 Cognitive Challenge 21
2.1 Port Intelligent Interaction Experiment 21
2.2 Hutchins Ship Experiment 25
2.3 ANT Viewed from TEGGS Experiment 31

3 The Birth of Human-Machine Knowledge 37
3.1 Formation of Wisdom Sharing System 37
3.2 Intervention of Multi-Agent 42
3.3 The Birth of Sociality Brain 46

4 The Kidnapping of Dual-Brain 53
4.1 Extension of Human "Brain & Mind" 53
4.2 Infinite Sociality Brain 61
4.3 The Structure of Dual-Brain 65

5 Protect Sociality Brain 71
5.1 Algorithm Freedom 71
5.2 Data Rights 75
5.3 Innovation Monopoly 80

Part II The Symbiotic Order

6 Class Division 87
6.1 Who Is It? 87
6.2 Who Am I? 93
6.3 Evolution of Community 99

7 Non-human Order with Humanity 105
7.1 The Symbiotic Ethics of Science and Technology 105
7.2 Human and Non-human 110
7.3 Class Correspondence of Ethics 115

8 Escape from Kidnapping 123
8.1 Return of Earth Carrying 123
8.2 Preference and Dependence 128
8.3 Escape from Kidnapping 133

9 Building a Mind-Inspired Society 139
9.1 Class Connotation and Proportion 139
9.2 Construction of Mind-Inspired Model 144
9.3 "Multi-level and Plural Monism" 150
9.4 Essence of Off-Site Economy 155

Appendix: AI, a Revolutionary to the World Trade Model 161

AI, a Revolutionary to the World Trade Model 165

Afterword 171

References 177

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