第一届国际智能科学会议

The First International Conference on Intelligence Science 2016

（ICIS2016）

China Chengdu

www.ICIS2016.cn
http://www.intsci.ac.cn/ICIS2016

Oct. 31 – Nov. 1, 2016

The First International Conference on Intelligence Science (ICIS2016)
Agenda
第一届国际智能科学会议议程

October 30 Sunday（10 月 30 日　星期日）				
Day 白天	Registration 全天报到注册			Eastar International Hotel (EIH) 怡东国际酒店
Evening 晚上	Reception， Teeroom at 3rd floor 持续提供晚餐　可三楼茶室休息交流			Eastar International Hotel(EIH) 怡东国际酒店
October 31 Monday（10 月 31 日　星期一）				
Morning 上午	Session Chair: Chuan Zhao 主持人：赵川			
	8:10-8:40	Opening session 开幕式	President of Chengdu University of Technology Shugen Liu: Welcoming address 成都理工大学刘树根校长致欢迎辞 General Co-chairs Yixin Zhong: Opening speech 会议主席钟义信发言	Academic Hall Of Chengdu University of Technology 成都理工大学国际学术报告厅
	8:40-9:00	Photo 照相	Outside the Hall 报告厅外广场	
	9:00-9:30	Yixin Zhong 钟义信	Intelligence Science: What, Why and How	
	9:30-10:00	Gordana Dodig-Crnkovic	Morphological computing as self-organisation of a cognizing intelligent agent	
	10:00-10:30	Cafee Break 茶歇		
	10:30-11:00	Dezhong Yao 尧德中	Music and Brain, and Brainwave Music 音乐和脑，及脑波音乐	
	11:00-11:30	Zhongzhi Shi 史忠植	Intelligence Science： An Interdisciplinary Subject 智能科学：一类交叉学科	
	11:30-12:00	Huajin Tang 唐华锦	Neuromorphic Cognitive Computing and Brain-Like Intelligence 神经形态认知计算与类脑智能	
	Lunch 午餐			EIH 怡东国际酒店

Afternoon 下午	Session Chair: Tianrui Li 主持人：李天瑞			
	13:30-14:00	Kun Wu 邬焜	Information, Knowledge, Intelligence, Practice and Human Beings with the God’s Feelings 信息、知识、智能、实践与人类的上帝情怀	Academic Hall Of Chengdu University of Technology 国际学术报告厅
	14:00-14:30	Lorna UDEN	Co-creation of value in Innovation	
	14:30-15:00	Guolin Wu 吴国林	Quantum Information and Intelligence 量子信息与智能	
	15:00-15:15	Video from Joseph 视频	Intelligence Science and Intelligence Philosophy: Another convergence?	
	15:15-15:30	Guangjian Zhang 张光鉴	Noetic Science and Similarity 思维科学与《相似论》	
	15:30-16:00	Jiali Feng 冯嘉礼	Attribute Topos Machine Induced by the Law of Unity of Opposites and Its Application 对立统一规律的属性 Topos 机模型及其在大成智慧学中的应用	
	16:00-16:30	Cafee Break 茶歇		
	16:30-17:00	Wen Cai 蔡文	Extenics and Artificial Intelligence 可拓学及人工智能	
	17:00-17:30	Jean-Yves Beziau	Logic and Intelligence	
	17:30-18:00	Guoyin Wang 王国胤	Multi-Granularity Intelligent Cognitive Analysis and Decision Making Based on Big Data 多粒度大数据智能认知分析与决策	
	6:00-7:00	Dinner 晚餐		EIH 怡东酒店
Evening 晚上	Salon Workshop 沙龙研讨			EIH Tee room At 3rd flor 怡东三楼茶室
	November 1 Tuesday (11 月 01 日 星期二)			
	Session Chair： Kun Wu 主持人：邬焜			
	8:00-8:30	Pedro C. Marijuán	Intelligence and the Information Flow: An Evolutionary Perspective 从进化的角度看信息和智能	Academic Hall Of Chengdu
	8:30-8:50	Video from	RUPA (Image), Mathematics and Mathematical Artist	

Morning 上午		Mihir Kr. Chakraborty 视频		University of Technology 国际学术报告厅
	8:50- 9:10	Keqin Zhao 赵克勤	Set Pair Analysis Theory（SPAT） and intelligence science 集对分析与智能科学	
	9:10- 9:40	Sophia Kidd （康书雅）	'Science' in Eastern Jin Guo Pu's Thought and Literature 东晋郭璞思想及著作中科学因素	
	9:40- 10:10	He Ouyang 欧阳合	Eight Consciousness of Buddhism and Cognitive Science 佛学唯识与认知科学	
	10:10- 10:30	Coffe Break 茶歇		
	10:30- 11:00	Xiaohui Zou 邹晓辉	The Double Matrix Constructed by Numbers and Characters: Formal Pivot to both Language and Intelligence in Science 双字棋盘--语言科学与心智科学的形式化枢纽	
	11:00- 11:30	Shimin Meng 孟世敏	Cognitive Information Flow Control Method - From Cognitive Computing to Cognitive Design 认知信息流调控方法——从认识计算走向认识设计	
	11:30- 12:00	Chuan Zhao 赵川	Intelligence Science Leads Future Civilization 智能科学揭橥未来文明	
	Lunch 午餐			EIH 怡东国际酒店
Afternoon 下午	2:00- 3:00	Visit campus of CDUT 参观校园		CDUT 恐龙博物馆
	3：00- 3:30	Establish the International Scientists Poetry Society on Poem Island 返回经诗岛，国际科学家诗社成立		Poem Island CDUT 校园诗岛
	3:30- 5:30	Discussion Session 两个自由讨论组。充分消化交流，总结形成较系统的共识（备茶）		Square and Round table meeting rooms Near the Academic Hall Of Chengdu University of Technology 学术报告厅旁方桌圆桌两个会议室 两个发言点都
		Theoretical Framework and Methodology of Intelligence Science IS的理论构架和方法论总结性讨论，以及与目前AI技术，教学科研，出版的整合	Interdisciplinary and Multidisciplinary Research of Intelligence Science 转动文明之轮，跨学科多学科研究；IS 对未来文明危机的考量及发展的引领	
		Session Chairs:	Session Chairs:	

		Zhongzhi Shi, Gordana Jiali Feng, Lorna, Yongguo Mo 论题主持并记录： 史忠植，Gordana，冯嘉礼，Lorna,莫永国	Chuan Zhao, Pedro, Kun Wu, Besiau, Kidd 论题主持并记录： 赵川，Pedro， 邬焜,Besiau，康书雅	设 5 个采录点安装 JoinNet 记录下发言
	5:30-6:30	**Awards and Closing Ceremony** 闭幕式暨智能科学发展贡献奖颁奖 Hosted by General Co-chairs Yixin Zhong 钟义信主持并致辞		Huangshan Room EIH
晚上	6:30-8:00	**Banquet** 晚宴		怡东国际酒店·黄山厅
	8:00-9:00	**Gathers the wisdom** 聚智雅集 古琴《高山流水》，小合唱《计算机之歌》，书画及 Besiau 摄影展，等		
November 2 Wednesday (11 月 2 日 星期三)				
Morning 上午		**Leave** 离会		
Noon 中午	12:00-13:00	**Lunch** 理工大学午餐		EIH 怡东国际酒店
Afternoon 下午		**Leave** 离会		

会议发言人

1 Intelligence Science: What, Why, How

Yixin Zhong, **Univ. of Posts & Telecom, Beijing 100088, China**

The author's understanding and definition on Intelligence Science is proposed for the first part of the presentation and some brief explanations for why we should now make big efforts for the intelligence science research is followed as the second part. Finally, the issues on how we should do for the intelligence science research is also discussed.

Biography

Yixin Zhong, Professor from the Center for Intelligence Science research, University of Posts and Telecommunications, Beijing, China.

His major interests for teaching and research include Communication Theory, Information Theory, Information Science and Artificial Intelligence. He has published 18 books and 495 papers in above areas. <Principles of Information Science> and <Principles of Advanced Artificial Intelligence> are the representatives for the books while "Comprehensive Information Theory", "Mechanism of Intelligence Creation" and "The Law of Information Conversion and Intelligence Creation" are typical examples for the papers.

He has been awarded many times by international and national academic organizations and Chinese Governments. He served as the first expert for the first National Communication Technology Project under National 863 Program, President of Chinese Association for Artificial Intelligence (CAAI), Chairman for China Neural Networks Committee (CNNC)，Vice President of World Federation of Engineering Organizations (WFEO) and Chairman of WFEO Standing Committee for Information and Communication.

He is one of the founders for the International Society for Information Studies (IS4SI) and is now Chairman of IS4SI China Chapter.

2 Morphological computing as self-organisation of a cognizing intelligent agent

Gordana Dodig-Crnkovic, **Chalmers University of Technology and University of Gothenburg & Mälardalen University, Sweden**

Firstly, all intelligent agents were conceived as living cognitive beings, almost always as humans. Today even computational and robotic cognitive systems are developed with certain degree of cognition. Intelligence can be seen as a capacity based on cognition and it is applied for problem solving and learning adaptive behaviours within an environment or a context. I will give a short account of my view of the process of agent's self-organisation and consequent reality construction through morphological computation, within the framework of info-computational constructivism as generative modelling scheme (Dodig-Crnkovic 2014a, 2014b, 2016).

Cognition in this framework is capacity possessed in different forms and degrees of complexity by every living organism and the same framework can be applied to artificial agents. Even a single cell while alive constantly cognizes, that is registers inputs from the world and its own body, ensures its own continuous existence through metabolism and food hunting while avoiding dangers that could cause its disintegration or damage, at the same time adapting its own morphology to the environmental constraints. The entirety of physico-chemical processes in an intelligent cognizing agent depends on the morphology (form and structure) of the organism. The essential property of morphological computing is that it is defined on a structure of nodes (agents) that exchange (communicate) information.

Biography

Dr. Dodig-Crnkovic has her background as a researcher at the Theoretical Physics Department of the University of Zagreb, Croatia. She moved to Sweden and made her PhD at the Manne Siegbahn Institute in Stockholm. After that she worked on numerical modelling as a Criticality Safety Analyst for the ABB Atom Company for 10 years. In the last years at ABB she wrote the Criticality Safety Handbook. Since then, she spent more than ten years at the Department of Computer Science and Networks at Mälardalen University, where she completed her second PhD, in Computing and Philosophy. Since 2014 she is part of Cognitive Science group at the Applied IT department, division of Cognitive science and communication.

Her current research interests include the Morphological computing and cognitive systems. She developed courses on Philosophy of Computing and Information, Theory of Science, Methodology of Transdisciplinary research, Professional and Research Ethics.

She utilizes her background in her current grant on Morphological computing funded by Swedish Research Council.

3 Music and Brain：Interrelation and Interaction

Dezhong Yao, University of Electronic Science and Technology of China, Chengdu, Sichuan, China

Music is one of the most mysterious phenomena in the universe. This talk will cover the following issues: 1) how does music affect us? I will show you the positive rhythm effect of Mozart K448 and the harmful effect of retrograde Mozart K448; 2) plasticity of musician's brain with neuroimaging evidences; 3)why does people like music? The reason is due to the power law followed by both music signal and physiological signal; 4) can we listen to the brain? A scale-free music of the brain is introduced with some vivid pieces composed from brainwaves of brain at different states such as REM, SWS, epileptic and AD.

For more details, pls look at: http://www.neuro.uestc.edu.cn/brainmusic.html

Biography

Dezhong Yao (dyao@uestc.edu.cn), PhD (1991, 2005) in Applied Geophysics and Biomedical Science, respectively; Full Professor (1995-), ChangJiang Scholar Professor (2006-); Dean, School of Life Science and Technology (2001-), University of Electronic Science and Technology of China, Chengdu 610054, China; Director, Key Laboratory for NeuroInformation, Ministry of Education of China (2010-);. His main research interests are EEG, fMRI based various applications such as brain-computer interface, Music-Brain interaction, brain mechanism of video game playing and various clinic disorders. Since 1990, he has published 100 more peer-reviewed international journal papers, with about 4000 citations (H index=34). He won the Outstanding Youth Research Fund of NSFC (2005), and the first class Natural Science Reward of the Ministry of Education (2010). More details at: http://www.neuro.uestc.edu.cn/bci/member/yao/yao.html

4 Intelligence Science：An Interdisciplinary Subject Online

Zhongzhi Shi, **Key Laboratory of Intelligent Information Processing, Institute of Computing Technology, Chinese Academy of Sciences**
Beijing 100190, China

Intelligence Science is an interdisciplinary subject which dedicates to joint research on basic theory and technology of intelligence by brain science, cognitive science, artificial intelligence and others. Brain science explores the essence of brain, research on the principle and model of natural intelligence in molecular, cell and behavior level. Cognitive science studies human mental activity, such as perception, learning, memory, thinking, consciousness etc. In order to implement machine intelligence, artificial intelligence attempts simulation, extension and expansion of human intelligence using artificial

methodology and technology. Scientists of intelligence science explore new concept, new theory, new methodology and applications. It will be successful and create a brilliant future in 21 century.

The long-term scientific goal of Artificial Intelligence is human-level artificial intelligence. Intelligence Science is the road to reach the long-term goal. This presentation will outline the framework of intelligence science, introduce the mind model CAM, discuss brain-like intelligence and prospect further research directions.

Biography

Zhongzhi Shi, Professor at the Institute of Computing Technology, Chinese Academy of Sciences. Fellow of CCF, CAAI. IEEE senior members, AAAI, ACM members. He has wide research interests, mainly including intelligent science, artificial intelligence, cognitive science, multi-agent systems, machine learning, neural computing. He has been responsible for 973, 863, key projects of NSFC. He has been awarded with various honors, such as National Science and Technology Progress Award (2012), Beijing Municipal Science and Technology Award (2006). the Achievement Award of Wu Wenjun artificial intelligence science and technology by CAAI (2013), the Achievement Award of Multi-Agent Systems by China Multi-Agent Systems Technical Group of AIPR, CCF (2016). He has published 16 books, including "Mind Computation", "Intelligent Science", "Advanced Artificial Intelligence", "Principles of Machine Learning", "Neural Network". Published more than 500 academic papers. He serves as chair of the machine learning and data mining group, IFIP TC12. He served as Secretary-General of China Computer Federation, vice chair of China Association of Artificial Intelligence.

http://www.intsci.ac.cn/en/shizz/

5 Neuromorphic Cognitive Computing and Brain-Like Intelligence

Huajin Tang, **College of Computer Science**

Sichuan University，China

Neuromorphic computing is an important emerging research topic in 21st century, which aims to emulate and build architecture and computation in hardware close to biological neural systems. US and Europe have launched large scale BRAIN and Human Brain Project, respectively. The talk starts to introduce the background and important research problems in developing neuromorphic cognitive systems. The other important topic of this talk is to introduce how the high level cognition functions arise from special groups of neurons, taking the example of spatial cognition theory bases on the discoveries of place cells and grid cells in rat's brain. The talk will extend to develop brain-like intelligence for robots. The talk aims to bring more discussions and attentions to this research area by developing computational models to understand brain-like intelligence.

Biography

Huajin Tang received the B.Eng. degree from Zhejiang University, Hangzhou, China, the M.Eng. degree from Shanghai Jiao Tong University, Shanghai, China, and the Ph.D. degree in electrical and computer engineering from the National University of Singapore, Singapore, in 1998, 2001, and 2005, respectively. He was a Research and Development Engineer with STMicroelectronics, Singapore, from 2004 to 2006. From 2006 to 2008, he was a Post-Doctoral Fellow with Queensland Brain Institute, University of Queensland, Australia. He has been leading the cognitive computing research group at Institute for Infocomm Research, Singapore since 2008. Now he is professor and director of Neuromorphic Computing Research Center, Sichuan University. He has published one monograph and over 70 international journal and conference papers. His current research interests include neuromorphic systems, computational and biological intelligence, and neuro-cognitive robotics. He is an Associate Editor of IEEE Trans. On Neural Networks and Learning Systems, IEEE Trans. On Cognitive and Developmental Systems, Frontiers in Neuromorphic Engineering.

6 Information, Knowledge, Intelligence, Practice and Human Ambition as God's love knot

Kun Wu，Xi'an Jiaotong University International Center for Philosophy of Information，Xi'an 710049, China

In human beings' basic knowledge paradigm, the world view characterized by absolute segmentation between matter and spirit has directly engendered the increasing isolation of philosophy and science. With the discovery of information world, this old-fashioned situation has been changed. And the information world also becomes a bridge combining the matter world and the spirit world, as well as unifying all areas of human knowledge domain.

The universal character of information world lays the basis for the unity of information science and philosophy of information. There exists no legitimacy for the separation between philosophy and science in the unified information science. In China, the research of information science and philosophy of information exhibits the characteristic of integrating the study of science and philosophy in a mutually integrated, comprehensive and unified fashion.

Information is the indirect existence of world, compared with the matter world of direct existence. Knowledge refers to the collection of systematic information, generated in the process and creation of information by epistemic subjects through perception and thought. And subjects with perceiving and practicing ability apply a dynamic approach and method, namely the intelligence, to grasp, process, create, develop, use and implement information (including knowledge). Practice is not a pure physical activity, but a realization process of subject's intentional information in objects through implementing planned information.

Of human activities, information, knowledge, intelligence and practice has a unified holographic nature. The for-self activity of information, information intuitive recognition, information memory storage, creation of information subject and the social implementation of subject's information, from lower level to higher level, are the five basic levels of subjects' information activities. Intelligent development of human's information activities follows two directions: one is the progressive intelligent construction from lower

level to higher level, and the other is the intelligent holographic control, comprehensive participation and mutual transformation from higher level to lower level.

There are always certain kinds of the God's love knot in human beings to pursue perfect intelligence in the development of philosophy and science (including artificial intelligence). People with the God's love knot tend to pursue prefect idealization, unlimited eternality and absolute ultimacy, which is a thinking paradigm with simplified and polarized tone. For positive effect, this thinking paradigm guides people to constantly pursue beauty and perfection in both theory and practice areas. But its limitation is also quite obvious, for the reason that the existence and evolution of the world is not just a calculating machine of numbers, but rather quite complicated and full of uncertainties and randomness intertwined within multi-dimensions, levels and directions.

Weapons and machines are man-made and also controlled by human beings. We can apply these products for our own benefit, or to harm and destroy ourselves. The key lying here is the opposition of people to people, rather than that of people to instruments of death, war or intelligent machines. The only way to avoid self-destruction of human race is to establish a democratic, free and harmonious social civilized system. Living on the earth flooded by absolutism and extremism, to avert human beings' catastrophe does not merely depend on whether we could manufacture the so-called "intelligent machines exceeding human's intelligence".

Biography

Kun Wu, male, was born in 1953 in Hebei Province, People's Republic of China. He is at present the director of the International Center of Philosophy of Information of Xi'an Jiaotong University (ICPI- XJTU), a member of XJTU Academic Committee, doctoral instructor and Grade-2 professor with special allowance of the State Council. He is also the vice-chairman of the International Society for Information Studies (IS4IS) and of its branch in China, a council member of the Chinese Society for Dialectics of Nature/Philosophy of Nature, Science and Technology as well as vice- director of the Committee on Complexity and Systems Science, a council member of the Chinese Society for Dialectical Materialism, director of Shaanxi Province Society for Dialectics of Nature, vice-chairman of Shaanxi Province Society for the Philosophy of Value, executive director of Shaanxi Provincial Philosophical Society, and etc. He has published 20 monographs, 2 translated books, certain textbooks, and over 360 academic papers in English and Chinese. Professor Wu hosted or independently assumed 17 national social science key/general projects, and was granted more than 50 scientific awards including several first and second prizes in national and provincial level. Professor Wu has introduced the concept of information as one of the most basic categories of philosophy, established the philosophy of information, and has conducted genuine research in the domains of information ontology, information epistemology, social information theory, information evolution theory, information value theory, information thinking theory and other fields. He has also given certain influential insights in a wide range of philosophical and scientific fields, such as philosophical fundamental theory, natural philosophy, modern systems science, information science, entropy theory and complexity theory. In addition, he has applied the method of information science, information philosophy and complexity theory to interpret some theories of ancient philosophy (including Greece, China and India) in a very distinctive way. His work has attracted wide attention at home and abroad, and Professor Wu has been praised as "the pioneer of the philosophy of information", "the founder of the philosophy of information" and "the first person of philosophy of information".

7 Co-creation of value in Innovation

Lorna Uden, Faculty of Computing Engineering and Sciences,
Staffordshire University, College Road
Stoke-on-Trent, Staffordshire ST4 2DE, UK

According to Coates (2009), in today's economy, businesses need to continuously reinvent themselves in order to adapt to increasingly complex and dynamic market realities. Organizations, including governments, are under intense pressure to create value. There is limit to value creation through efficiency in existing operations. Value creation is a collaborative process and is always co-created. A new approach to service innovation is needed if the needs of the customers are to be satisfied. Experience Co-Creation (ECC) is a new paradigm of strategy innovation proposed by Ramaswamy and Gouillart (2008). This paper describes the importance of co creation of value for service innovation. This model can also be used effectively to promote research in intelligence science due to the interdisciplinary nature of the subject.

Biography

Professor Dr. Lorna Uden has published over 200 papers in conferences, journals, chapters of books and workshops. Her research interests include Learning Technology, Web Engineering and Technology, Human Computer Interaction, Groupware, Activity Theory, big data, innovation, E-business, Knowledge management, E-government, Semantic web, Web services, big data, service innovation, social media, Service Science, Internet of Things and Problem-Based Learning (PBL). She travels round the world to give research seminars and Problem Based Learning workshops.

Professor Uden is program committee member for many international conferences and workshops. She is on the editorial board of several international journals. She is founder and editor in chief of the International Journal of Web Engineering and Technology (IJWET) and the International Journal of Learning Technology (IJLT), published by Inderscience, UK.

Professor Uden has been visiting professor to universities in Australia, Brazil, China, Colombia, Finland, India, Italy, Japan, Korea, Malaysia, Mexico, New Zealand, Slovenia, Slovakia, Spain, South Africa and Taiwan. She has been keynote speaker at many international conferences. On the international front, she collaborates widely with colleagues worldwide in paper writing. She is the founder of the KMO and LTEC conferences. Professor Uden is also the conference chair of KMO2017 and LTEC 2017.

8 Quantum Information and Its Cognitive Meaning

Guolin Wu, **Research Center for Philosophy of Science and Technology，South China University of Technology，China**

The cognition science is one of the disciplines which develop rapidly, but it has not included features of quantum mechanics into its reaches by now. Quantum information theory based on quantum mechanics has risen since the 1990s; it also brings inspirations to the cognition science. Quantum information is the information that is based on quantum mechanics and different from classic information. Quantum information is superposed, coherent, no-cloning and no-deleting. Quantum computing is different from classic computing, truly paralleling and whole, and it has the power beyond classic computing and overcomes the classic complexity. The past conclusions related with cognition mainly result from classic computing thinking.

Quantum information, quantum entanglement and quantum computing have an important influence on the cognition problems such as Chinese Room, connectionism and the entanglement of cognition and so on. The formal syntax or rules are objective, with real content, not purely formal or syntactic. There is the smallest information unit of cognition from the quantum information. Quantum information must rely on quantum objects or quantum reality, and this means that quantum information is related with contexts of quantum objects. There is the similarity between Minimum of quantum information and information encapsulation of perception. Some of the cognitive information processing may be non-local. human cognition has non-locality, human thinking is sometimes here, sometimes there, sometimes between each other, or appear in both at the same time, our imagination is of quantum non-locality, just a flash of thought is possible to imagine the edge of the universe, but when it comes to logic reasoning whose speed is definitely slower than the speed of light.

Biography

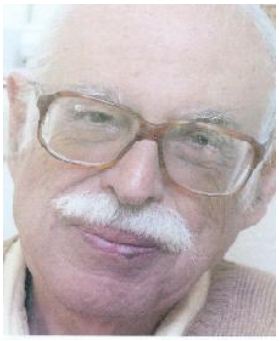
Born in 1963, Ph.D, Professor, Vice Dean, School of Marxism, South China University of Technology; Director, Research Center for Philosophy of Science and Technology, South China University of Technology; President, Chinese Association for Philosophy of Physics; Convenor, Southern forum for Philosophy of Technology

Main Research Domains: Philosophy of Physics, Philosophy of Quantum information, Philosophy of Technology(quantum technology), Philosophy of Science and Technology in Phenomenology, Quantum Phenomenology, Philosophy of cognition and so on.

Major Projects: (a)China's Education Department Fund for Philosophy and Social Sciences (2006): The Philosophical Studies for Quantum Control Theory. (b) China's National Fund for Philosophy and Social Sciences (2010): The Philosophical Studies for Quantum Technology. (c) The Key Project of Philosophy and Social Sciences Foundation of the Ministry of Education of P. R. China："The Studies on Trends of Modern Philosophy of Technology"（2011）(Project Number: 11JZD007).

Main Publications, More than 140 papers in academic publications and international conferences.

9 INTELLIGENCE SCIENCE AND INTELLIGENCE PHILOSOPHY: ANOTHER CONVERGENCE?



Joseph E. Brenner, **International Center for the Philosophy of Information, Xi'An, P. R. China**

Intelligence is perhaps best described as a capacity for moral as well as material survival. Intelligence Science is a developing body of knowledge that has a unique philosophical dimension, since intelligence is above all a human phenomenon. In previous work, I have discussed the relation of Information Science to and Philosophy. As noted by Wu Kun, the convergence of Information Science and Information Philosophy is becoming more and more apparent, toward a unified Science-Philosophy of Information. Perhaps even more than the latter, Intelligence Science challenges the relative role of metaphysics and phenomenology in their implications for the society and the emergence of an Intelligence Philosophy. We thus can already, in its earliest stages, see Intelligence Science in its most theoretical as well as practical aspects as a 'Science-Philosophy' resulting from the convergence of the scientific and philosophical characteristics of intelligence, where intelligence is the conjunction of pragmatic and social capability defined above.

Biography

Joseph E. Brenner was born in Paris in 1934. He received B.A. and M.S. degrees from the University of Chicago and in 1958 a Ph.D. in Organic Chemistry from the University of Wisconsin, followed by postdoctoral studies at the Swiss Federal Institute of Technology, Zurich and the Massachusetts Institute of Technology.

In 1960, he joined the Du Pont Company as a polymer chemist. From1965 to his retirement in 1994, he was involved in corporate development and technology transfer with Du Pont de Nemours International in Geneva, Switzerland, working in the Middle East, Africa and Eastern Europe, including the former Soviet Union.

In 1998, he began collaboration with Basarab Nicolescu, Professor (em.) of Theoretical Physics and President of the International Center for Transdisciplinary Research (CIRET) in Paris. The primary objective of this collaboration has been to make the logical system of the Franco-Romanian thinker Stéphane Lupasco (Bucharest, 1900 – Paris, 1988) accessible to English-language readers. Brenner has presented this work at conferences and seminars in Europe, the U.S., China and Brazil

In 2010, Brenner started collaboration with Professor Wu Kun, Director of the International Center for the Philosophy of Information at the Jiaotong University in Xi'An, and was named Associate Director of this Center. He is involved with the organization of the 3rd International Conference on the Philosophy of Information to be held in Gothenburg, Sweden in June, 2016, to be held jointly with the Conference of the International Society for Information Studies (IS4SI), centered in Vienna. Brenner is a Board Member of IS4SI with responsibility for Inter- and Transdisciplinarity.

10 Noetic Science and Similarity

Guangjian Zhang, **Study Science Research Center, Southeast University, Nanjing, China**

Similarity theory is one of the theories of noeticscience. Its purpose is to study the similar movement, similarity relation and similarity creation law which exist in the natural, social and thought domain. Therefore, it has epistemological and methodological significance. Similarity = same + variation. No similarity, there is no movement of nature, there is no contact, there is no creativity. The progress of science and technology, the natural world is absolutely the same thing with the variation of the decision

Biography

Born in 1934 in Chengdu, Sichuan Province. Researcher, former director of the Institute of thinking, Shanxi Academy of Social Sciences. Chinese Academy of thought of the preparatory group leader. Editor in Chief of China "Noetic Science" magazine. Qian Xuesen academic research center academic adviser in Shanghai Jiaotong University. Part-time professor at the Study Science Research Center, Southeast University. The State Council special allowance experts, the National May 1 medalist, National model worker.

In 1992, The Jiangsu Science and Technology Publishing House published "similarity" written by Guangjian Zhang. In 1993, won the seventh national book award. In 2000, "Science Education and similarity" monograph published by the Jiangsu Science and Technology, was defined for key scientific research projects by the Ministry of Education. In 2001, won the East China Science and Technology Award for outstanding books. His view of similarity has been praised by experts in the field of international conference on cognitive science held by Moscow University, and has drawn wide attention in philosophy, noetic science, education and literature. At present, Prof. Guangjian Zhang combines the latest achievements of modern noetic science, brain science and neurocognitive science with the similarity theory to make the similarity theory of noetic science play a greater role in cultivating creative talents of science and technology. He is currently writing a book "similarity and creative thinking train" .

11 Attribute Topos Machine Induced by the Law of Unity of Opposites and Its Application

Jiali Feng, **College of Information Engineering, Shanghai Maritime University, Shanghai, China**

The Turing problem: "Can Machines Thinks?" not only involves the basic contradiction between "spirit" and "substance" in philosophy, but also induces a chain of secondary contradictions, such that the law of the mutual movement, development and transformation between a pair of contradict u and v, i.e. so-called "law of unity of opposites and dialectic transformation" becomes the core subject that must be studied in Noetic Science, Artificial Intelligence and Theory of Meta Synthetic Wisdom.

Base on the follow facts, the space-time position of u, $x_t(u)=x_i(u)+\Delta x(\Delta t)(t=i+\Delta t)$ not only is the character showing the existence of the object u is there, but also a measurable physical quantity varying with time change Δt, and as well as the representable attribute of quality of $u\neq v$, noted $q_v(u)$ (or $q(u)$), when the equivalent relationship " $u\neq v \Leftrightarrow x_t(u)\neq y_t(v)$" is occurring, the transformation mechanisms during the movement of object u from $x_i(u)$ to $y_t(v)$ the position of the opposite object v, and a non-essential changes $q_j(u)$ of u is being have when it at the position $x_j(u)$, and u conversion into its contradictory objects v at the point $x_T(u)(\approx y_T(v))$ are studied. It is show that the mechanisms induce a sire of Mathematical construction such as Qualitative Mapping, the Attribute Categories and Attribute Topos Machine, the Evaluation and Decision based on Analysis of Attribute Coordination System and so on. And its applications in Mathematics, Physics, Logic, Noetic Science and Intelligent Science are discussed in this paper.

Biography

Jiali. Feng was born in China, in 1948.12.1, he get his B.S in Mathematics in the Mathematics Department at Guangxi Normal University, in Guilin, Guangxi, China, in 1982. He was a visiting scholar in Mathematics Department at Beijing Normal University from 1988 to 1989. He get his PhD in radioprotection at China Institute of Atomic Energy in 2001. His research is focused on the attribute theory method in Noetic Science and Intelligence Science.

After graduation he was engaged as a teacher in Guilin 8th High School from 1982 to 1984. He was a lecturer, an associate professor and a professor at Guangxi Normal University from 1984 to 2000, as the deputy dean of the College of Mathematics and Computer Science from 1999 to 2000. Since 2000 he is a Professor in Department of Computer Science at Shanghai Maritime University, and served as dean of College of Information Engineering at the University from 2003 to 2005. He is a pluralistic professor of Academy of Disaster Reduction and Emergency Management, Ministry of Affairs of china & Ministry of Education of China, at Beijing Normal University from 2007.

Dr. Feng is deputy director of Machine Learning Society, Chinese Association for Artificial Intelligence during 2000-2015. Member of IEEE Shanghai Section. President of the Noetic Science of Shanghai from 2012.

12 Extenics and Artificial Intelligence

Wen Cai, **Research Institute of Extenics and Innovation Methods, Guangdong University of Technology, China**

We compares theoretically some foundational problems of Extenics with that of artificial intelligence in some respects including the study objects, extension models, extension logic and extension set. And then we discuss the applications of extension theory and extension method in some technologies of artificial intelligence.

Biography

Prof. Cai Wen, graduated from Zhongshan University of China in 1964, nominated among the national distinguished experts of China due to his prominent research work, the founder of the new subject Extenics.

13 Logic and Intelligence

Jean-Yves Beziau, **Rio de janeiro at the University of Brazil.**

Universal logic is the field of logic that studies the common features of all logical systems, aiming to be to logic what universal algebra is to algebra. A number of approaches to universal logic have been proposed since the twentieth century, using model-theoretic and categorical approaches. The roots of universal logic may go as far back as some work of Alfred Tarski in the early twentieth century, but the modern notion was first presented in the 1990s by Swiss logician Jean-Yves Béziau

Biography

Jean-Yves Beziau is PhD in mathematics (University of Paris 7) and PhD in philosophy (University of São Paulo, Brazil). He has done research in France, Brazil, Poland, California (UCLA, Stanford, UCSD), and Switzerland. He is presently professor of logic in Rio de janeiro at the University of Brazil.

He is the promoter of Universal Logic as a general theory of logical structures, the founder and Editor-in-Chief of the journal Logica Universalis and book series Studies in Universal Logic, both published by Birkhäuser/Springer, Basel. He has organized a series of events on universal logic around the world (Montreux 2005, Xi'an 2007, Lisbon 2010, Rio de Janeiro, 2013, Istanbul 2015).

He has renewed the study of the square of oppposition, organizing interdisciplinary world events on this topic (Montreux 2007, Corsica, 2010, Beirut 2012, Vatican 2014, Easter Island 2016) and the publication of special issues of journals and books on the subject.

14 Multi-Granularity Intelligent Cognitive Analysis and Decision Making Based on Big Data

Guoyin Wang, **Chongqing Key Laboratory of Computational Intelligence, Chongqing University of Posts and Telecommunications, Chongqing 400065, China**

Decision making based on big data is the developing trend of many fields like public administration, industrial production, health & medical, financial service, etc. New information technologies such as cloud computing, big data, Internet+, artificial intelligence, et al, have more and more impact on the development of all fields of the society.

It becomes one of the key challenge problems in data science to analyze and process big data intelligently and realize the value of big data. In this talk, the history of the development of intelligent data analysis from small data analysis to intelligent analysis and mining of big data is reviewed. A model of three spaces world, “physical space + social space + data space”, is presented. The study of multi-granularity intelligent cognitive analysis and decision making is presented, including multi-granularity computing, multi-granularity cognition, multi-granularity clustering, multi-granularity decision making, multi-granularity joint problem solving, etc. Some related success cases are introduced.

Biography

Guoyin Wang received the bachelor’s degree in computer software, the master’s degree in computer software, and the Ph.D. degree in computer organization and architecture from Xi’an Jiaotong University, Xi’an, China, in 1992, 1994, and 1996, respectively. He worked at the University of North Texas, USA, and the University of Regina, Canada, as a visiting scholar during 1998-1999. Since 1996, he has been working at the Chongqing University of Posts and Telecommunications, where he is currently a professor and PhD supervisor, the Director of the Chongqing Key Laboratory of Computational Intelligence, and the Dean of the College of Computer Science and Technology.

He was named as a national excellent teacher of China in 2001, a National Level Talent of the New Century Hundred, Thousand and Ten Thousand Talents Project of China in 2009, a Science and Technology Innovation Talent of the National High-level Personnel of Special Support Program of China in 2014, a Chang Jiang Scholar by the Ministry of Educations, China, in 2014.

He is a Fellow and the President of International Rough Set Society (IRSS), a Vice-President of the Chinese Association for Artificial Intelligence (CAAI), a council member of the China Computer Federation (CCF), and a senior member of IEEE. He served or is currently serving on the program committees of many international conferences and workshops, as program committee member, program chair or co-chair. He is an editorial board member of several journals. He has delivered over 30 invited talks at international and national conferences, and has given many seminars in USA, Canada, Poland, and China. He is the author of over 10 books, the editor of dozens of proceedings of international and national conferences, and has over 200 reviewed research publications. His books and papers have been cited over 8000 times.

15 Intelligence and the Information Flow: An Evolutionary Perspective

Pedro C. Marijuán, **Bioinformation and Systems Biology Group，Aragon Institute of Health Sciences (IACS—IIS Aragon), 50009 Zaragoza, Spain**

In today's scientific word there seems to be a window of opportunity for attempting the synthesis of a new field devoted to intelligence—Intelligence Science. Actually, some of the most interesting synthetic disciplinary attempts of last century have directly or indirectly concerned intelligence: such is the case of psychology, behavioral science, cognitive science, artificial intelligence, artificial life, complexity science... That they did not plainly succeed –to state it prudently– is manifest. And that accumulation of relative failures may be taken both as a stimulus for attempting a new synthesis from new vantage points and as a call to prudence. In any event, it won't be an easy enterprise.

In the opinion of this author, a conspicuous absence in those previous attempts concerned the evolutionary dimension (as anthropocentrism and computer-centrism were strongly dominating), and also the relatively narrow conceptions of information involved (either Shannonian, or thermodynamic, or formal-logical). Herein we will intertwine both missing aspects: evolution of communication capabilities on the one side, and the "information flow" on the other. We will imply, via the clever management of that information flow by Nature, that there has been a general evolution of a sort of "natural intelligence", from single cells to multicellular organisms and to advanced nervous systems, extending also to societies.

Seemingly the linguistic capability of humans has put our societies in an entirely new path. That's right, but we can also analyze the evolution of the information flows and the processing structures in our societies along some of the previous guidelines: both the natural information flows related to the individual lives and the artificial flows generated via technological systems. Like in the case of cells or in nervous systems, a degree of "social intelligence" might be ascertained too.

In human societies, the new thinking needed for Intelligence Science should contribute to a more cogent social management of the whole system of sciences. The art of "knowledge recombination" has to be practiced with some more scientific guidance, mainly by Intelligence Science and Information Science, so that the immense body of scientific knowledge accumulated –in the order of 6,000 disciplines– becomes useful to reorient the productive system and to grant collective sustainability. A new scientific culture has to be promoted; a new dialog among theoretical and experimental scientists and philosophers from very different fields has to be established; and the natural phenomenology underlying the essential link between intelligence and information has to be plainly revealed. In the extent to which this can be achieved, an important social mission will be fulfilled by Intelligence Science and Information Science.

Biography

Education: Industrial Engineer in the field of "Enterprise Organization", Universidad Politécnica de Cataluña (1975). Doctor in Cognitive Neuroscience, PhD Thesis on "Natural Intelligence", Universidad de

Barcelona (1989).

Scholarly Activities: During more than 30 years, research on the nature of information & communication and on the nature of intelligence, looking at both the molecular-cellular and organismic (brain) levels; co-founder with Michael Conrad of FIS (Foundations of Information Science); organizer and co-organizer of several international conferences in the FIS field (Madrid 1994, Vienna 1996, Paris 2005, Beijing 2010); organizer of the International Cajal Conference (Zaragoza, 1999); organizer of the regular series of conferences "Ateneo del CPS"; organizer of the series of conferences "Encuentros de Neurociencias (2005-07); organizer of the Biomedical Seminars (IACS-UZ); organizer of the “Foros de Innovación en Biomedicina”. Promoter of the Aragonese Biorregion: Bio-Med Aragón.

Research projects: More than 20 research projects on systems biology, neuroscience, & social science.

Scientific publications: Author of more than 80 publications in International Journals, most of them with impact factor.

Fields of Research: Research in Bioinformation: an “integrative” approach to Systems Biology; prokaryotic and eukaryotic signalling systems; enzyme networks and molecular automata; cell theory. Research in Neurociences: central neurodynamic theory; information processing of laughter; EEG in fybromialgia; consciousness. Research in Social Sciences: social dynamics of knowledge (scientomics); the “sociotype”, a new metrics on human communicative interactions. Research in Foundations of Information Science. Nature of information; the vertical flow of information in biological and social systems.

16 RUPA (IMAGE), MATHEMATICS AND MATHEMATICAL ARTIST

Mihir Kr. Chakraborty, **School of Cognitive Science Jadavpur University，Kolkata, India**

In this take, a new approach forwards the philosophy of mathematics has been proposed in which the ontology of the mathematical object has been considered to be similar to an artifact -an art object, a mental image or RUPA. RUPA is a word of sanskrit language meaning visual images or forms but it also include the beauty radiated from the image. A mathematician has been considered as an artist creating this kind of mental image a RUPA. It has been argued that a mathematician has two main roles to play-as an artist, creation of mathematical objects, the 'RUPA's and then as a discoverer, probing into further properties hidden into the mathematical object created by herself. Other similarities with the artistic creation has been focused similarities with musical performance has also been probed into. Finally consistency in mathematics has parallel with symmetry am balance in art. In art symmetry traditional plays a very vital role as consistency play in mathematics. Yet an artist desires to liberate herself from traditional symmetry in order to create new art. Can such a thing happen in mathematics also with respect to the

notion of consistency? The talk ends with a positive nod toward the answer."

Biography

Mihir Kumar Chakraborty Ph.D. Professor of Pure Mathematics, University of Calcutta. Mathematician, India. Major area of research : non-classical logics, Fuzzy Set theory, Rough Set theory, Modal logics, Philosophy of mathematics, Knowledge Representation, Functional analysis. Publishes: more than 100 research papers; 4 book, one is "geometry of approximtions" (with Piero Pagliani)by Springer Verlag; Edited three books(College Publications, London, LNCS/LNAI series by Springer Verlag); Member of the Editorial Board: Transactions of Rough Sets ,Springer; Studies in Logic, Sun Yat-sen University and Chinese Association of Logic， Springer; Held visiting Positions at RWTH(Germany), Warsaw University, University of Paris, University. of Salerno(Italy),IRIT(France),University of Wollongong(Australia),University of Helsinki (Finland),University of Regina (Canada),San Yat-sen University (China) and Southwest University(China), etc. Interested in Art, Literature and Nature.

17 Set Pair Analysis (SPA) theory and Intelligent Science

Keqin Zhao, **Zhuji Institute of Connection Mathematics, Zhuji 311811,China**

Set Pair Analysis(SPA) is a kind of mathematical theory，which is used for processing system uncertainty. The theory was first put forward in 1989 by Ke-qin Zhao, who is the Chinese scholar in the field of mathematics. The SPA theory use the Contact Number as the main mathematical tool, that's why SPA is called the Connection Mathematics(MA) as well. Using the Connection Number of features, we could solve the problems of uncertainty, in the way of Objectively to admit the existence of uncertainty, Systematically described the existence of uncertainty, Quantitatively depict uncertainty, Concrete analysis to uncertainty.

In achieving this method, several relationship could be combined, such as the probability theory and the fuzzy set theory, the simplicity and the complexity, the certainty and the uncertaintyare, the system analysis and the quantitative calculationare, the static and the dynamic, etc. As a result, SPA is called Connection Science(CS) as well. Set Pair Analysis(or Connection Mathematics and Connection Science)has been widely used in many fields. Till now, there're more than 4000 literatures used the SPA theory both in Chinese and English can be searched in CNKI. These literatures are in wild fields, such as aviation, weather forecast, geological mining, hydrology and water resources, energy, transportation, environment, ecology, society, economy, machinery manufacturing, transportation, logistics, post and telecommunications, communications, medical, health, sports, education, politics, security, culture, computer and artificial intelligence ,etc. At the same time, there were 11 monographs about research and application of SPA published in China. As intelligent science is an ability of solving the uncertainty information and uncertainty information essentially, and it's a frontier science to connect the other

subjects such as the mathematics, physics, information science, and life science, so that, SPA could be regarded as the basic subject of intelligent science.

Biography

Researcher of Zhuji Institute of Connection Mathematics. Born in 1950, Zhuji Zhejiang Province. He is the inventor of the theory of set pair analysis (contact mathematics), which is put forward in 1989. Till now more than 100 papers were published in the field of "set pair analysis and its applications", such as wonderful connection number, interval decision set pair analysis and other books. A formal director or deputy director of the specialized committee, Chinese Association of Artificial Intelligence. Now serve as director of the Zhuji Institute of mathematics，Zhejiang province, China. Director of the Institute for Set Pair Analysis and Research, Institute of non traditional security and peace development research center of Zhejiang University. Honor director of the Specialized Committee for set pair analysis and contact mathematics in Chinese Association of Artificial Intelligence.

18 Scientific Dimensions in the Thought and Work of Eastern Jin Guo Pu

Sophia Kidd 康书雅, **Sichuan University, School of Literature and Journalism，Sichuan, China**

This paper offers a perspective on intelligence science grounded in the humanities rather than in the sciences. However, the methodology employed in research and argumentation throughout this paper aims to be scientific in nature, using a textually grounded approach as its base of operations in exploring scientific dimensions in Eastern Guo Pu's 郭璞 (276-324 CE) thought and work. In light of the academic debate in China and internationally regarding the history of Chinese scientific thought prior to and through the Qing dynasty, we also explore what we mean in this paper by 'scientific'.

As space and time are limited, we will focus our discussion of Guo Pu's work on the author's preface in his annotation and commentary of the Classic of Mountains and Seas 山海经. It will be demonstrated that Guo Pu's thought and writing, while empirically grounded in linguistic and natural sciences, also made great contribution to what we know of today as the social sciences, such as cultural geography. We will discover that many of the prejudices, then as well as today, against Guo Pu as being too 'vacuous' 虚 and not 'scientific' or 'real' enough 实, were and are founded in a prejudice against cosmological models popular in the Han Dynasty such as Yin Yang 阴阳, Five Element 五行, and Yijing 易经 based ontologies. Judgments of these cosmological and ontological models as 'unscientific' lie at the fault line uneasily separating rational thought from imagination. Lastly, in order to provide context for Guo Pu's work as a geographer in his annotation of the Mountains and Seas, we will also examine the scientific dimensions found in the preface to another cartographic work, Yu Gong diyu tu 禹贡地域图 written by Western Jin author and geographer, Pei Xiu 裴秀(224-271 CE).

Biography

Sophia Kidd earned her B.A. in Philosophy in 1999 from the University of California: Santa Cruz, where she studied the History of Consciousness with Professor David C. Hoy, Philosophy in Literature and Religion with Professor Robert Goff, and Philosophy of Computers with Professor David Chalmers. In 2012, she earned her M.A. in Classical Chinese Literature from Sichuan University under Professor Liu Liming. In the fall of 2012, she began reading for her Ph.D. in Classical Chinese Literature at Sichuan University under Professor Zhou Yukai. Her area of focus is literary geography and regional aesthetics in Medieval China.

19 Eight Consciousnesses and Cognitive Science

He Ouyang, **Jade Technologies And**

Math Dept, National University of Defense Technology
1999 West Maanshan Rd, Kunshan, Jiangsu, China

In this talk, we re-express the Eight-Consciousnesses of Buddhism (ECB) and modern pattern recognition in a uniform frames by category theory, and by comparing this two schemes of cognitive processing, we explored a possible new way to provide some hints from ECB to AI which could incorporate the topos logic, quantum logic with human thinking through gate Monas with natural Bayes machine built-in.

The other part of the talk is to point out that topos is the right language for describing “vagueness” in a logic system and a possible way to unify the probability with the intuitionist logic.

Biography

Dr. Ouyang is an engineer and an entrepreneur and he worked in Silicon Valley of USA for more than 10 years and founded two high tech companies: WISChip in USA and Jade Tech in China. Dr. Ouyang published more than 10 mathematical papers in international journals. His research interests include differential geometry, functional analysis, category theory, computer vision, artificial intelligence, deep learning, quantum mechanics, general relativity and Buddhism etc. Dr. Ouyang was an invited speaker at several AMS annual meetings, European Differential Geometry Conference, Big data and AI Conferences, Chinese Academy etc. Dr. Ouyang holds a B.A. in Mathematics from National University of Defense Technology, Changsha, PRC, an M.A. in Mathematics from Beijing Normal University, PRC and Ph.D. in Mathematics from Washington University in St. Louis, MO, USA.

20 The Double Matrix Constructed by Numbers and Characters: Formal Pivot to both Language and Intelligence in Science

Xiaohui Zou, **SINO-US Searle Research Center (Zhuhai), China**

This paper aims to achieve human-machine interaction and optimize interpersonal communication with specific Chinese characters chess and Chinese language manual. Furthermore, this paper will reveal the formal pivot to both human intelligence and artificial intelligence and its scientific principle.

The following steps are the method comprises: the first step, depicting the ideal blueprint, visible from the seven milestones, the ideal blueprint for the near future, is to break from the fifth milestone as the beginning; the second step, constructing the theoretical model, by the dual approach and five levels visible, the theoretical model is built from the second approach to the successful establishment; the third step, making the typical software, perspective from structure, formalization and automation of the big data of abstracts in Chinese, the key is the double matrix constructed by numbers and characters. Results: obtaining the foundational implementation example of concrete application, which can make teachers and students of liberal arts, science subjects and engineering disciplines all understand and participate in the corresponding part of the event. Conclusion: from one point to entire area, which not only can peep a spot known the whole leopard, but also it can be put into action. The specific performance is a series of pilot and the application. Recent systematic application of the most prominent can make it be popularized and used for the thinking, memory and communication, especially academic exchanges and art exchanges, and it also can be used for computer bilingual information processing, storage and interaction, and significantly improve the efficiency of labor of human intelligence and quality of artificial intelligence software. Especially it plays a role in computer aided education and research, service and leads the social development, international exchanges, cultural inheritance and innovation, and other aspects.

Biography

Courses and professional research: Communication (Railway school 1980-1981); English (Guizhou University 1983-1987); International Law (Jilin University 1997-1999) ; Linguistics and Information Processing (Peking University 2007-2008) , (Harvard University 2010); Higher Education and Management (Chinese University of Science (Beijing) 2009-2016 ; Philosophy of mind (Berkeley 2010-2012). Main research interests: Research on language and mind, information and computer. Major achievements and awards: Stationed and operated carrier (hardware 1994) ; Knowledge information processing (international and domestic patent invention award 2000); Intelligence Means Information Processing(VII International Ontology Congress，Spain 2006); Formal Method with Indirect Computing Model, Collaborative Intelligent Computing System: Theoretical Model with Its Application, (AAAS 2012); The Double Matrix Constructed by Numbers and Characters (software 2014); Two major categories of formal strategy (paper 2013) ;Bilingual information processing methods and its principles (paper 2015); Basic Law of Information: the Fundamental Theory of Generalized Bilingual Processing (IS4IS 2016).

21 Research framework of brain cognitive structure based on human machine cognitive coupling state —Cognitive design from cognitive computing

Shimin Meng, **Key Laboratory of cognitive computing and intelligent information processing， Wuyi College, Wuyishan City, Fujian Province, China**

Learning is the change of cognitive structure. Currently, the cognitive structure is the object coming and going without a trace. Constructing cognitive mathematical description theory, and innovating cognitive observation, detection, prediction, reconstruction and imaging technologies are of great importance.

The foundation of the study of cognitive structure is the structure observation and information collection of the cognition in a brain. How to observe the cognitive structures and processes in a brain? From the perspective of observation, cognitive structure observation is divided into two major ways, namely, internal direct mode in which the cognitive structures are observed by entering in a brain and external coupling mode in which the cognitive structures are observed by mirroring, inducting, coupling to the exterior of a brain. From the perspective of information, cognitive structures are the link topology networks of cognitive information processing, where computers are good imaging and coupling tools. Based on mathematical tools, such as category, topology, manifold and dynamic systems, as well as cognitive philosophy, such as situations, embodiment, distribution, extension, research platforms and structures of human computer interaction cognitive coupling state are established to realize cognitive process, structural explicitation, visualization, and systematization. Research on structure, function, topology, dynamics and evolution is carried out for cognitive structures, providing technical support for designing, constructing, training and regulating the human machine cognitive structures, thus promoting the development of the application in human machine learning and education.

Biography

Meng Shimin (mengshimin@ulinkm.com), chief expert on cognitive technology, Key Laboratory of cognitive computing and intelligent information processing, Wuyi College. He graduated from a secondary normal school at the age of 18. Then, he became a primary school teacher in a rural area, setting up thinking training courses for students. Later, he participated in National College Entrance Exam, and took computer and theoretical physics courses in University of Science & Technology China. After graduating from university, he became an educational software engineer, responsible for human-computer software design and R&D of man machine learning platforms. Since 2005, he has collaborated with Wuyi College to build a research team on human machine learning, and carried out research on cognitive structure observation of human computer interaction and cognitive structure dynamics. (e-mail:mengshimin@ulinkm.com, tel:0599-5110723)

22 Intelligence Science Leads Future Civilization

Chuan Zhao, **Chengdu University of Technology, Chengdu, China**

From Artificial Intelligence (AI) to Intelligence Science (IS) is a strategic transformation led by the Chinese Association For Artificial Intellgence(CAAI), in October, 2003. After the success to hold rules of natural, the view of science has begun focused to intelligence. Intelligence Science is a new science while scientific spirit applied to mental phenomena. It is an emergent multidisciplinary direction. Here long-stangidng orientcal thoght and West modern culture meet, here Science, Art and philosophy meet, and new paradigm for civilization should evolve.

I should mention the Wheel of Civilizations and research how we should run it to form new civilization, should take about the three-dimension-symmetry we should balance now. Though Intelligence Science has born only 13 years and very few people know it, but it has already been an important contribution to science. For it focue human's attention to deep and big scienctifical questions. It has great mission and should led the development of science and future civilization. I should talk aobut the development of IS these year and put out some open questions for scholars to go on discuss.

As a researcher of Intelligence Science I should expound my own original work Phase Theorem later. It was put out in 2005, during the first Conference on Universal Logic in Switzerland. In that conference the title of my speech was: "Form Orient Logic to Phase Theory". I am trying to integrate science and orient thought. What is phase and how phase changes? Phase is a basic concept within almost many fields. The presentation should introduce some new development these years.

Biography

Zhao Chuan, associate professor at Chengdu University of Technology. She is the director of Intelligence Science laboratory (ISL) created at 2011.

She studied theoretical physics in Sichuan University and earned her B. Sc in 1990, that period she wished to pass her academic life with only a paper and a pen. She studied computer science and as a visiting scholar in the University of Science and Technology. She did wide research in Intelligence Science(IS) since it was put out 2003 by CAAI. She does interdisciplinary foundational research and focus on AI, IS, NLU, logic, combinatorics and robot, etc. She set up the ISL and do many precious creative exchange and cooperation study. She published many papers and a book THE FRONTIERS OF INTELLIGENCE SCIENCE, 2014, China Science Press. She like art, philosophy, work on science and explore education. She proposes and practice such integrity that bridges between east and west, science and art, ancient and modern. For example formalization of orient thought, art cognizance and so on.

She consist original theoretical research. She has created Phase Theory at 2005 and is building it since then. She wishes her academic study should be elegance like Lotus.

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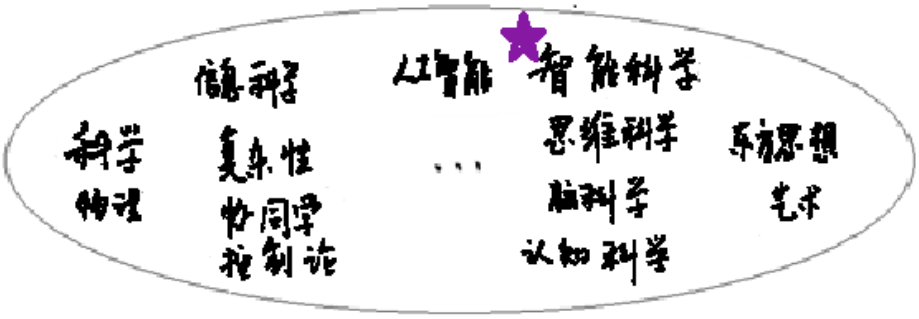

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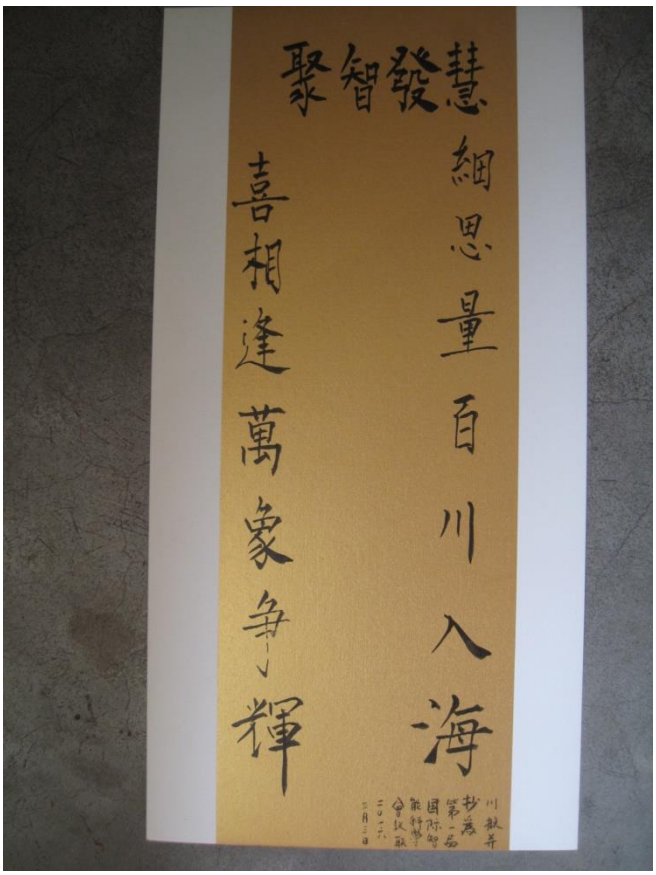
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