SOFT COMPUTING: PAST, PRESENT, FUTURE (GLOBAL ISSUE)

Moderators: Janusz Kacprzyk, Vesa A. Niskanen
Panelists: Janusz Kacprzyk, Vesa A. Niskanen, Zenn Bien, Didier Dubois, Masoud Nikravesh, Hannu Nurmi, Rudi Seising, Junzo Watada, Lotfi A. Zadeh

Abstract

In the brief history of Soft Computing (SC) various events, phenomena, innovations and outlooks have changed our lifestyle in the Globe. Examples are fall of communism and expansion of market economy, increase of environmental pollution, globalization, the more active role of the USA in the world politics, wars in Europe and the Middle East, expansion and new role of the EU, aims for global sustainable development, innovations in biology, information technology and computational intelligence as well as women's more active role in our society. In this period of time we have also had some permanent problems characteristic of humanity from which hundreds millions of people are still suffering such as poverty, undernutrition, lack of education, oppression, discrimination, violence and warfare.

Our panel considers the role and outcomes of SC in the light of the foregoing phenomena. We consider general issues such as role of SC in social and behavioral sciences, medicin, economics and philosophy (esp. philosophy of science, methodology, and ethics). We also consider aspects of decision making, democracy and voting as well as manufacturing, industrial and business aspects.

Moderators

Prof. Janusz Kacprzyk is Deputy Director for Scientific Affairs in Systems Research Institute, Polish Academy of Sciences. His research interests include Fuzzy logic, Fuzziness in database management systems, Intelligent decision support systems, Fuzzy and possibilistic approaches to knowledge representation and processing, Management of uncertainty in knowledge-based systems, Decision making and control under uncertainty and imprecision (fuzziness), Evolutionary programming, and its applications, Neural networks, and their applications. He has acted as a Treasurer of IFSA and at present he is the President-Elect of IFSA.

Dr. Vesa A. Niskanen has studied fuzzy systems since the 1970's mainly from philosophical, logical and methodological standpoint. He completed his Licentiate's thesis on fuzzy logic in 1980 and Doctoral thesis on fuzzy linguistic models in 1986 in the Dept. of Philosophy at the University of Helsinki. Since 1980's he has focused his research on fuzzified theory of truthlikeness, philosophical aspects of Soft Computing and fuzzy linguistic cognitive maps. Dr. Niskanen acted as the Secretary of IFSA in 1999-2003. He is the Chair of BISC SIG in Philosophy of Soft Computing, Secretary of the IFSA Society NSAIS, and Chair of the IFSA Information Committee. Today Dr. Niskanen acts as a Docent and University Lecturer in the Dept. of Economics & Management at the University of Helsinki. In this position he is also responsible for organizing instruction in informatics for the students in the Faculty of Forestry and Agriculture. Website: www.helsinki.fi/~niskanen

Panelists

Prof. Didier Dubois is a Research Advisor at IRIT, the Computer Science Department of Paul Sabatier University in Toulouse, France and belongs to the French National Centre for Scientific Resarch (CNRS). He holds a Doctorate in Engineering from ENSAE, Toulouse (1977), a Doctorat d'Etat from Grenoble University (1983) and an Honorary Doctorate from the Faculté Polytechnique de Mons, Belgium (1997). Didier Dubois is the co-author, with Henri Prade, of two books on fuzzy sets and possibility theory, and 12 edited volumes on uncertain reasoning and fuzzy sets. Also with Henri Prade, he coordinated the HANDBOOK of FUZZY SETS series published by Kluwer (7 volumes, 1998-2000, 2 of which he co-edited). It includes the recent book Fundamentals of Fuzzy Sets , edited again with H. Prade (Kluwer, Boston, 2000). He has contributed more that 100 technical journal papers on uncertainty theories and applications.

Didier Dubois has been an Associate Editor of the IEEE Transactions on Fuzzy Systems, of which he is now an Advisory Editor. He is a member of the Editorial Board of several technical journals, such as the International Journal on Approximate Reasoning, the International Journal on General Systems and Information Sciences among others. Since January 1, 1999, he has been co-Editor-in -Chief of Fuzzy Sets and Systems. He is a former president of the International Fuzzy Systems Association (1995-1997). In 2002 he received the Pioneer Award of the IEEE Neural Network Society, and the 2005 IEEE TFS Outstanding Paper Award. His topics of interest range from Artificial Intelligence to Operations Research and Decision Sciences, with emphasis on the modelling, representation and processing of imprecise and uncertain information in reasoning and problem-solving tasks.

Dr. Masoud Nikravesh: Dr. Nikravesh is the Executive Director of BISC (Berkeley Initiative in Soft Computing), the Computer Science Division at the University of California, Berkeley. BISC is a world-leading center for basic and applied research in soft computing, computing with words (CW), computational theory of perception (CTP), common senses and human reasoning, and precisiated natural language (PNL)-computation and reasoning with information presented in natural languages. Since 1994, Dr. Nikravesh's main focus has been on the development of computational intelligence within the framework of soft computing (evolutionary computing including GA and DNA coding, neural network, fuzzy logic, and probabilistic reasoning). The framework has been applied for data understanding and knowledge discovery from multiple scientific domains. Dr. Nikravesh is visiting Research Scientist in the Imaging and Informatics Group at, Lawrence Berkeley National Laboratory. He is the LBNL-NERSC (National Energy Research Scientific Computing Division) representative to the DiMI- UC Discovery Program and he is member of Executive Committee and member of research council-UC Discovery program. Dr. Nikravesh has published six books and over 150 papers and presentations on a wide range of topics in artificial intelligence and soft computing. He has led a team of scholars and interacted with private and Government funding institutions to develop strategic research plans. He has served as reviewer and has been on the board of several public and private IT centers of excellence. His credentials have led to front-page news at Lawrence Berkeley National Laboratory News and headline news at the Electronics Engineering Times.

Prof. Hannu Nurmi is the Professor of political science at University of Turku, Finland . Before taking up his present position he was the associate professor of methodology of social sciences at the University of Turku. From 2003 till 2008 Nurmi is an Academy Professor of the Academy of Finland. Nurmi has been a Senior Fulbright-Hays Scholar at the Johns Hopkins University

(Baltimore, MD, USA), a British Academy Wolfson Fellow at University of Essex (UK) and the Government of Finland/Nancy and David Speer Visiting Professor of Finnish Studies at University of Minnesota (USA). A member of the Finnish Academy of Science and Letters. Nurmi serves on the editorial board of four scientific journals. He is the author of eight scholarly monographs, co-editor of three books and the author or co-author of well over a hundred research articles. Nurmi specializes in applied decision, game and social choice theory, specifically in voting and electoral systems as well as institutional design. The focus of his interest in fuzzy sets is on preference aggregation and group choice.

Dr. Rudi Seising carries out research in Medical Expert and Knowledge Based Systems at the Department of Medical Computer Sciences, University of Vienna Medical School. He is specialized in SC applications in medicine as well as historical and philosophical aspect of SC.

Prof. Junzo Watada works in Waseda University in Graduate School of Information, Production and Systems Education. He received his B.S. and M.S. degrees in electrical engineering from Osaka City University, Japan, and Dr. of Eng. degree by the research on fuzzy multivariate analysis from Osaka Prefecture University, Osaka, Japan. At present he is a Professor of Management Engineering at Graduate School of Information, Production & Systems, Waseda University since 2003, after having contributed for 13 years as a professor of Human Informatics and Knowledge Engineering, to the School of Industrial Engineering at Osaka Institute of Technology, Japan. He had been with Faculty of Business Administration, Ryukoku University for 8 years. Before moving to Academic, he was with Fujitsu Ltd. Co., where he worked on development of software systems as a senior system engineer for 7 years. His research interests are very broad including fuzzy system methodologies for data analysis, decision support systems and experts systems, financial engineering, macro-ergonomics. Recently he works actively on intelligent systems, genetic algorithms, neural networks, DNA computing, and so on. Especially he contributes in developing soft-computing methodologies for financial engineering and fuzzy multivariate analysis for analysis of economics and corporations, including facility assess management and brand strategy. Also, he works on economical analysis of information technology industries in various countries and on survey and analysis of company management. Dr. Watada has developed fuzzy production function, fuzzy AR time-series analysis and fuzzy multivariant analyses, and applied them to economical analysis. Recently he applies DNA computing to the optimal parts allocation problem for Robot manufacturing and DNA informatics. He is a member of IFSA working committee, an advisory board of BISC Group, BISC Special Interest Group in Philosophy of Soft Computing , Helsinki University, Finland since 1996, an advisory board of Journal of Centre for Artificial Intelligence and Robotics, Malaysia since 1996, member of Czech-Japan Research Cooperation since 1998, a founding member, Japanese-Hungarian Integrated Intelligent Systems Laboratory(IISL) in Budapest, Hungary. He has been consulting and co-working with several corporations including Fuji Investment Management Co.

Ltd., Fujitsu Ltd., Matsushita Electric, Sumitomo Metallurgy Corporation, Dentsu, Kansai Power Electronics, Konoike Construction, and so on methodologies of fuzzy systems, expert systems, data analysis, etc. He is an editorial board of International Journal of Systems and Control Engineering, IMECHE part I, United Kingdom and of International Journal of Innovational Computing and Information Control (IJICIC), an honorary adviser and an editorial board of Review Journal for National Institute of Inventions. He has edited several international journals including Fuzzy Sets and Systems, International Journal of Approximate reasoning and so on as a guest editor. He has served as a chair, a co-chair or a member of an advisory committee, a co-chair or a member of an international program committee, a secretariat general, an organizing committee, organizers of sessions, etc. for various international conferences. Dr. Watada is contributing as an external examiner to Chinese University of Hong Kong for about 15 years and several universities in Malaysia for 8 years and as an advisory board committee to Malaysia University of Technology for five years and an assessment member of Research Grants Council of Hong Kong and of Research Grants Council of Czech Republic Science Academy for more than 20 years. VIII Academic Activities He was the President of Bio-Medical Fuzzy Systems Association (2001-2003). He was the Vice President of Japan Society for Fuzzy Theory and Systems for two years (1993-1995) and was a board committee of Japan Society for Fuzzy Theory and Systems, and also serve as the principal editor for its journal, and was the president of Japan Chapter of International Fuzzy System Association for two years (1993-1995) and is a board committee of Japan Society for Fuzzy Theory and Systems, and also served as the principal editor for its journal. And he contributes several journals as an editorial board. He is a member of IFSA, Japan Society for Fuzzy Theory and Intellectual Informatics, etc.

Lotfi A. Zadeh
Prof. Lotfi A. Zadeh; BISC Director
Prof. Zadeh is a Professor in the Graduate School,Computer Science Division, Department of EECS, University of California, Berkeley. In addition, he is serving as the Director of BISC (Berkeley Initiative in Soft Computing). His earlier work was concerned in the main with systems analysis, decision analysis and information systems. His current research is focused on fuzzy logic, computing with words and soft computing. Lotfi Zadeh is a Fellow of the IEEE, AAAS, ACM, AAAI, and IFSA. He is a member of the National Academy of Engineering and a Foreign Member of the Russian Academy of Natural Sciences. He is a recipient of the IEEE Education Medal, the IEEE Richard W. Hamming Medal, the IEEE Medal of Honor, the ASME Rufus Oldenburger Medal, the B. Bolzano Medal of the Czech Academy of Sciences, the Kampe de Feriet Medal, the AACC Richard E. Bellman Central Heritage Award, the Grigore Moisil Prize, the Honda Prize, the Okawa Prize, the AIM Information Science Award, the IEEE-SMC J. P. Wohl Career Acheivement Award, the SOFT Scientific Contribution Memorial Award of the Japan Society for Fuzzy Theory, the IEEE Millennium Medal, the ACM 2000 Allen Newell Award, and other awards and honorary doctorates.