

2012 IEEE CIS Awards

Fuzzy Systems Pioneer Award

Piero P. Bonissone, General Electric
Global Research, USA

For contributions to the representation and management of uncertainty in intelligent systems.



Piero Bonissone received his Bachelor degree in Mechanical and Electrical Engineering in 1975 in Mexico City (Mexico). All his graduate degrees are from the University of California, Berkeley, CA: Master in Electrical Engineering and Computer Science (1976), Master in Mechanical Engineering (1979), PhD in Electrical Engineering and Computer Science (1979).

A Chief Scientist at GE Global Research, Dr. Bonissone has been a pioneer in the field of fuzzy logic, AI, soft computing, and approximate reasoning systems applications since 1979. During the eighties, he conceived and developed the Diesel Electric Locomotive Troubleshooting Aid (DELTA), one of the first fielded expert systems that helped maintenance technicians in troubleshooting diesel-electric locomotives. He has been the principal investigator in many DARPA programs, from Strategic Computing Initiative, to Pilot's Associate, Submarine Operational Auto-

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mation System, and Planning Initiative (ARPI). During the nineties, he led many projects in fuzzy control, from the hierarchical fuzzy control of turbo-shaft engines to the use of fuzzy logic in dishwashers, locomotives, and resonant converters for power supplies. He designed and integrated case-based and fuzzy-neural systems to accurately estimate the value of single-family residential properties when used as mortgage collaterals. In early 2000, he designed a fuzzy-rule based classifier, trained by evolutionary algorithms, to automate the placement of insurance applications for long term care and term life, while minimizing the variance of their decisions. This classifier has been in production since 2003.

Recently he led a Soft Computing (SC) group in the development of SC application to diagnostics and prognostics of processes and products. This included the prediction of remaining life for each locomotive in a fleet, to perform efficient assets selection. His current interests are the development of multi-criteria decision making systems for PHM and the automation of intelligent systems lifecycle to create, deploy, and maintain SC-based systems, providing customized performance while adapting to avoid obsolescence.

He is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) for his *leadership in the development of artificial and computational intelligence techniques and their applications to real-world problems*; of the Association for the Advancement of Artificial Intelli-

gence (AAAI) for his *pioneering development of uncertainty calculus and its application to fuzzy-logic based control systems*; of the International Fuzzy Systems Association (IFSA) for his *achievements in the research of Fuzzy Systems and service to IFSA*; and a Coolidge Fellow at GE Global Research for *overall technical accomplishments*. Since 2010, he is the President of the Scientific Committee of the European Centre of Soft Computing. In 2008 he received the II Cajastur International Prize for Soft Computing from the European Centre of Soft Computing. In 2005 he received the Meritorious Service Award from the IEEE Computational Intelligence Society. He has received two Dushman Awards from GE Global Research. In 1986 he received the King-Sun Fu Award from the North American Fuzzy Information Processing Society (NAFIPS) for his *distinguished services to NAFIPS*. He served as Editor in Chief of the *International Journal of Approximate Reasoning* for 13 years. He is on the editorial board of five technical journals and is Editor-at-Large of the *IEEE Computational Intelligence Magazine*. He has co-edited six books and has over 150 publications in refereed journals, book chapters, and conference proceedings, with an H-Index of 27 (using Google Scholar). He received 60 patents issued from the US Patent Office (with another 50 pending patents).

From 1982 until 2005 he was an Adjunct Professor at Rensselaer Polytechnic Institute, in Troy NY, where he

supervised 5 PhD theses and 33 Master theses.

He has co-chaired 12 scientific conferences and symposia focused on Multi-Criteria Decision-Making, Fuzzy sets, Diagnostics, Prognostics, and Uncertainty Management in AI. Dr. Bonissone is very active in the IEEE, where he was a member of the IEEE Fellow Evaluation Committee from 2007 to 2009. In 2002, while serving as President of the IEEE Neural Networks Society (now Computational Intelligence Society) he was also a member of the IEEE Technical Board Activities (TAB). He has been a member of the Executive Committee of NNC/NNS/CIS society since 1993 (as VP of Finances and President Elect/President/Past President) and an IEEE CIS Distinguished Lecturer since 2004.

Fuzzy Systems Pioneer Award

Abraham Kandel, The University of South Florida, USA

For theoretical and practical contributions to fuzzy switching systems and automata.



Abraham Kandel received his Bachelor degree in Electrical Engineering from Technion-Israel Institute of Technology in 1966, his Masters degree in Electrical Engineering from University of California in 1968, and his Ph.D. in Electrical Engineering and Computer Science from University of New Mexico in 1977.

In 1970 he became Assistant Professor in the Computer Science Department at New Mexico Institute of Mining and Technology and Tenured Professor in 1976. From October 1976 to September 1977 he was Visiting Senior Lecturer at Tel-Aviv University, Electrical Engineering Department and Mathematics Department, Israel and Ben Gurion University of The Negev, Electrical Engineering Department, Israel.

In 1978 he became Associate Professor and Director of Computer Science in the Department of Mathematics and Computer Science at Florida State University and in 1981 became Tenured Professor. In 1984 he was a Professor and Founding Chair of the Department of Computer Science at Florida State University and remained Chair until 1991. From November 1984 to September 1985 he took a sabbatical leave from Florida State University and was a Visiting Professor in the Department of Mathematics and Computer Science at Ben Gurion University of The Negev, Israel. From March to August of 1990, Visiting Professor at Paris VI, Computer Science Department, France.

While at Florida State University he cofounded the FSU/FAMU College of Engineering and Program Director for Electrical Engineering Department, FSU/FAMU College of Engineering from 1982 to 1985. He was also Director of The Institute for Expert Systems and Robotics from 1984 to 1991 and Director of The State University System Center for Artificial Intelligence from 1988 to 1991.

In 1991 he became Distinguished Research Professor and Endowed Eminent Scholar in the Department of Computer Science and Engineering at University of South Florida and was Department Chairman from 1991 to 2003. While at the University of South Florida he was Director of Software Testing Center (SOFTEC) from 1999 to 2000. In 2000 he became Executive Director of The National Institute for Systems Test and Productivity (NISTP), in 2001 he became Executive Director of Florida Type II Center for Software Testing, and in 2002 he became Executive Director of The National Institute for Applied Computational Intelligence (NIACI). From October 1996 to September 1997, and January 1990 to March 1990, he was a Visiting Professor at Tel-Aviv University, Electrical Engineering Department, Israel.

His research interests are primarily in applied fuzzy logic and computational intelligence with considerable work on the advancement of fuzzy logic. He has

been specifically interested in decision-making in uncertain environments, software testing and productivity, robotics and intelligent autonomous systems, artificial intelligence and knowledge engineering, expert systems and hybrid systems, neural networks, genetic algorithms, data mining, database and knowledgebase management, pattern recognition.

He has been the major advisor for 43 Masters of Science and 21 PhD students and has published over 600 research papers and is author, co-author, editor or co-editor of 50 textbooks and research monographs in the field. He is a Life Fellow of Institute of Electrical and Electronics Engineers (IEEE), and Fellow of: Association for Computing Machinery (ACM), New York Academy of Sciences, American Association for the Advancement of Science (AAAS), International Fuzzy Systems Association (IFSA), and a member of North American Fuzzy Information Society (NAFIPS), International Association of Pattern Recognition (IAPR), American Society for Engineering Education (ASEE), and Sigma-Xi. He is presently an editor for 21 journals in his fields.

He has received numerous awards and recognition for work as an educator and researcher including in 1993–1994 receiving the College of Engineering Outstanding Research Award at University of South Florida, in 1995 Sigma-Xi Outstanding Faculty Researcher Award; in 1995 Theodore and Venette-Askounes Ashford Distinguished Scholar Award at University of South Florida (1995); in 1996 MOISIL International Foundation Gold Medal for Lifetime Achievements; in 1997 Distinguished Researcher Award at University of South Florida; in 1997 Professional Excellence Program Award at University of South Florida; in 1999 Medalist of the Year by the Florida Academy of Sciences; in 2000 Honorary Scientific Advisor by the Romanian Academy of Sciences; in 2002 President's Award for Faculty Excellence at University of South Florida; in 2003 Fulbright Senior Research Fellow Award at Tel-Aviv

University, Israel; and in 2005 Fulbright Senior Specialist at Ben Gurion University, Israel, and again in 2008 at University of Bern, Switzerland.

Evolutionary Computation Pioneer Award

Russell C. Eberhart, Indiana University Purdue University Indianapolis, USA and James Kennedy, US Department of Labor, USA

For the invention of particle swarm optimization.



Russell C. Eberhart is the CTO of Phoenix Data Corporation. He is also Professor of Electrical and Computer Engineering at the Purdue School of Engineering and Technology, Indiana University Purdue University Indianapolis (IUPUI). He was formerly Vice President and CTO of Computelligence, LLC. He received his Ph.D. from Kansas State University in electrical engineering. He is co-editor of a book on neural networks (1991), and co-author of *Computational Intelligence PC Tools*, published in 1996 by Academic Press. He is co-author of a book with Jim Kennedy and Yuhui Shi entitled *Swarm Intelligence*, published by Morgan Kaufmann in 2001. He is the co-author, with Yuhui Shi, of a book entitled *Computational Intelligence: Concepts to Implementations*, published in August 2007 by Morgan Kaufmann/Elsevier. He was awarded the IEEE Third Millennium Medal. In January 2001, he became a Fellow of the IEEE. He was elected a Fellow of the American Institute for Medical and Biological Engineering in 2002. He has been awarded four U. S. Patents, and is an inventor for another recently filed patent. He has done groundbreaking work in applying swarm intelligence to human tremor analysis, sleep disorders medicine, evolutionary analog computing, logistics, spectrum warfare, and optimization of resource allocation.



James Kennedy is a social psychologist employed by the US Department of Labor, and co-originator of the particle swarm algorithm. His interest in social dynamics grew out of graduate research with Professor Bibb Latané at the University of North Carolina, in 1989, when a visiting group of Polish researchers led by Andrzej Nowak was implementing simulations of Latané's Social Impact Theory in a cellular automaton environment. In those simulations, reported in a landmark 1990 Psychological Review paper, one-dimensional, binary individuals arranged in a matrix were influenced by their neighbors.

While working for a contractor in North Carolina, Kennedy met Russell C. Eberhart and was introduced to computational intelligence paradigms including evolutionary algorithms. Simulations of bird-flocking and fish-schooling, informed by knowledge of Social Impact Theory and genetic algorithms, resulted in some programs that hinted at the potential of the particle swarm, and collaboration with Eberhart led to the development of the basic algorithm. According to Google Scholar, Kennedy and Eberhart's first 1995 paper introducing particle swarm optimization has been cited more than 13,000 times in the literature.

Throughout his career, Kennedy has regarded the particle swarm as a kind of simulation of human social behavior, stressing the importance of collaboration in the evolution of knowledge. Early papers focused on the relationship between culture and the individual. As the paradigm began to emerge under the umbrella of Evolutionary Computation, his research came to focus more on technical aspects of the swarm. A 1998 paper called attention to cycles in the trajectory of the particle as system parameters were adjusted in a simplified, deterministic system, leading to important improvements in understanding and controlling the particle's

behavior. His investigations into swarm communication topology resulted in insights into the holistic properties of the population, and especially revealed the interdependence between the individual particle's programmed behavior and the pattern of the swarm's communications. Kennedy's "bare bones" algorithm has motivated research on minimalist versions and search for the essentials necessary for the swarm to perform well, as well as introducing research into the effects of various probability distributions on swarm behavior. He has created models where humans participate with computational particles in the swarm and has presented particle swarm ideas to the world of management, where they can be applied to human organizations, as well as publishing swarm papers in psychology journals.

Evolutionary Computation Pioneer Award

J. David Schaffer, Binghamton University, USA

For contributions to multi-objective optimization and to the fundamental understanding of genetic algorithms.



J. David Schaffer received his Bachelor of Science degree in Aerospace Engineering from Notre Dame in 1967. He spent two years as a VISTA (Volunteers In Service To America) volunteer working in the "war on poverty" in Little Rock Arkansas. Having acquired an interest in complex social problems, he acquired an MS in Systems Engineering from Widener University in 1973. After short staff appointments at Georgetown University, Department of Economics, and The George Washington University, School of Public Health, he became head of the biometrics laboratory at the Tennessee Neuropsychiatric Institute as a staff member in the Department of Psychiatry at Vanderbilt

University. He then moved to the Department of EE and Biomedical Engineering. Here he became involved with a group exploring artificial intelligence and began to focus on machine learning. He had the good fortune to encounter Dr. John Greffentette who brought knowledge of this new approach called genetic algorithms (GAs). Here he formed the idea that intelligent machines were unlikely to be successful if hand-crafted, but needed to be evolved. He later discovered that this concept had been formulated 15 years before by Dr. Larry Fogel (and suggested as early as 1950 by Alan Turing). He completed his PhD in Electrical Engineering at Vanderbilt in 1984 wherein he formulated VEGA (Vector Evaluated Genetic Algorithm). Although VEGA was conceived for and applied to a task in multi-class pattern learning, he realized that the door was then open to multi-objective optimization with GAs. This work he presented at the first International Conference in GAs (ICGA) at Carnegie Mellon University, organized by Dr. Grefentette in 1985.

In 1985 he joined Philips Research in Briarcliff Manor, NY where he launched a project aimed at theory development and applications of GAs. In 1988 he was able to hire Dr. Larry Eshelman with whom he had fruitful collaboration for the next 22 years. They engaged in pioneering work combining GAs and neural networks. An early successful application was software that could produce digital filters without multipliers (all coefficients were powers of two, enabling multiplication by register shifting). With Dr. Eshelman's CHC algorithm and indirect representation approach, they produced an early commercially successful product, software that configured Philips's surface mount device (SMD) assembly robots. He and Dr. Eshelman produced a number of papers illuminating the effects of different crossover operators, proving the effect of Eshelman's incest prevention operator in combating genetic drift, and developing special crossover operators for subset selection.

This later operator was then applied to the bioinformatic analysis of datasets such as gene expression microarrays and proteomics.

In 2010 he retired from Philips and took a position as research professor and Binghamton University in the Bioengineering Department. Here he continues to pursue his passion for evolving intelligent machines, now focusing on spiking neural networks. His first two students took their graduate degrees in 2009. He also guides students in bioinformatics. He has remained active in the EC community, serving on the committees of most of the ICGAs and having served as associate editor of the *Evolutionary Computation Journal (ECJ)* from 1994–2006 and editorial board member since then. He also serves on the Evolutionary Multi-Objective conference steering committee (EMO). He has published some five dozen peer-reviewed papers and holds 34 issued US patents.

Meritorious Service Award

Bernadette Bouchon-Meunier, Université Pierre et Marie Curie, FRANCE

For long-time service and dedication to the Society.



Bernadette Bouchon-Meunier is currently a director of research at the National Center for Scientific Research, head of the department of Databases and Machine Learning, member of the board of directors of the Computer Science Laboratory of the University Pierre et Marie Curie (LIP6).

She has worked on fuzzy information processing since the 70s and her topics of interest are on fuzzy logic, soft computing, fuzzy data mining, and intelligent systems. She is the (co-)editor of twenty-two books, the (co)author of four books in French and one in Vietnamese, and the author or co-author of over 300 papers in journals, conferences and books.

She is a co-founder with Ronald R. Yager, and co-executive director, of the International Conference on Information Processing and Management of Uncertainty in Knowledge-based Systems (IPMU) held every other year since 1986 and technically co-sponsored by IEEE Computational Intelligence Society. She is also the Editor-in-Chief of the *International Journal of Uncertainty, Fuzziness and Knowledge-based Systems* she created in 1993, published by World Scientific Publishing. She is an IEEE Fellow and a Fellow of the International Fuzzy Systems Association.

A member of the Computational Intelligence Society Administrative Committee in 2004–2006, 2007–2009, 2011–2013, she has been a member of several CIS committees or subcommittees, including, since 2003, the Fuzzy Systems Technical Committee she is chairing in 2011. She chaired the Women in Computational Intelligence Committee in 2004–2007, and the Graduate Student research Grants subcommittee in 2009–2010. A founding member of the Computational Intelligence Society France Chapter in 2003, she has been the chair of this Chapter since 2007.

An International Executive Committee member of the 1st IEEE Conference on Fuzzy Systems in 1992, and a Program Committee member of many of the following ones, she served as the Program Chair of FUZZ-IEEE 2010 in Barcelona. She was the General Chair of the IEEE Symposium Series on Computational Intelligence, held in Paris in April 2011 and gathering 35 symposia and workshops, with more than 750 participants. She is currently the General Chair of the next IEEE Conference on Fuzzy Systems to be held in Brisbane (Australia) in 2012.

IEEE Transactions on Neural Networks Outstanding Paper Award

H. Chen, P. Tino, X. Yao for their paper entitled "Probabilistic Classification Vector Machines", vol. 20, no. 6, pp. 901–914, June 2009.

Digital Object Identifier: 10.1109/TNN.2009.2014161

Abstract – In this paper, a sparse learning algorithm, probabilistic classification vector machines (PCVMs), is proposed. We analyze relevance vector machines (RVMs) for classification problems and observe that adopting the same prior for different classes may lead to unstable solutions. In order to tackle this problem, a signed and truncated Gaussian prior is adopted over every weight in PCVMs, where the sign of prior is determined by the class label, i.e., +1 or -1. The truncated Gaussian prior not only restricts the sign of weights but also leads to a sparse estimation of weight vectors, and thus controls the complexity of the model. In PCVMs, the kernel parameters can be optimized simultaneously within the training algorithm. The performance of PCVMs is extensively evaluated on four synthetic data sets and 13 benchmark data sets using three performance metrics, error rate (ERR), area under the curve of receiver operating characteristic (AUC), and root mean squared error (RMSE). We compare PCVMs with soft-margin support vector machines (SVM_{Soft}), hard-margin support vector machines (SVM_{Hard}), SVM with the kernel parameters optimized by PCVMs (SVM_{PCVM}), relevance vector machines (RVMs), and some other baseline classifiers. Through five replications of two-fold cross-validation F test, i.e., 5 times 2 cross-validation F test, over single data sets and Friedman test with the corresponding post-hoc test to compare these algorithms over multiple data sets, we notice that PCVMs outperform other algorithms, including SVM_{Soft} , SVM_{Hard} , RVM, and SVM_{PCVM} , on most of the data sets under the three metrics, especially under AUC. Our results also reveal that the performance of SVM_{PCVM} is slightly better than SVM_{Soft} , implying that the parameter optimization algorithm in PCVMs is better than cross validation in terms of performance and computational complexity. In this paper, we also discuss the superiority of PCVMs' formulation using maximum a posteriori (MAP) analysis and margin analysis, which explain the empirical success of PCVMs.

IEEE Transactions on Evolutionary Computation Outstanding Paper Award

A. K. Qin, V. L. Huang and P. N. Suganthan for their paper entitled “Differential Evolution Algorithm with Strategy Adaptation for Global Numerical Optimization”, vol. 13, no. 2, pp. 398–417, April 2009.

Digital Object Identifier: 10.1109/TEVC.2008.927706

Abstract – Differential evolution (DE) is an efficient and powerful population-based stochastic search technique for solving optimization problems over continuous space, which has been widely applied in many scientific and engineering fields. However, the success of DE in solving a specific problem crucially depends on appropriately choosing trial vector generation strategies and their associated control parameter values. Employing a trial-and-error scheme to search for the most suitable strategy and its associated parameter settings requires high computational costs. Moreover, at different stages of evolution, different strategies coupled with different parameter settings may be required in order to achieve the best performance. In this paper, we propose a self-adaptive DE (SaDE) algorithm, in which both trial vector generation strategies and their associated control parameter values are gradually self-adapted by learning from their previous experiences in generating promising solutions. Consequently, a more suitable generation strategy along with its parameter settings can be determined adaptively to match different phases of the search process/evolution. The performance of the SaDE algorithm is extensively evaluated (using codes available from P. N. Suganthan) on a suite of 26 bound-constrained numerical optimization problems and compares favorably with the conventional DE and several state-of-the-art parameter adaptive DE variants.

IEEE Transactions on Evolutionary Computation Outstanding Paper Award

Q. H. Nguyen, Y. S. Ong and M. H. Lim for their paper entitled “Probabilistic

Memetic Framework”, vol. 13, no. 3, pp. 604–623, June 2009.

Digital Object Identifier: 10.1109/TEVC.2008.2009460

Abstract – Memetic algorithms (MAs) represent one of the recent growing areas in evolutionary algorithm (EA) research. The term MAs is now widely used as a synergy of evolutionary or any population-based approach with separate individual learning or local improvement procedures for problem search. Quite often, MAs are also referred to in the literature as Baldwinian EAs, Lamarckian EAs, cultural algorithms, or genetic local searches. In the last decade, MAs have been demonstrated to converge to high-quality solutions more efficiently than their conventional counterparts on a wide range of real-world problems. Despite the success and surge in interests on MAs, many of the successful MAs reported have been crafted to suit problems in very specific domains. Given the restricted theoretical knowledge available in the field of MAs and the limited progress made on formal MA frameworks, we present a novel probabilistic memetic framework that models MAs as a process involving the decision of embracing the separate actions of evolution or individual learning and analyzing the probability of each process in locating the global optimum. Further, the framework balances evolution and individual learning by governing the learning intensity of each individual according to the theoretical upper bound derived while the search progresses. Theoretical and empirical studies on representative benchmark problems commonly used in the literature are presented to demonstrate the characteristics and efficacies of the probabilistic memetic framework. Further, comparisons to recent state-of-the-art evolutionary algorithms, memetic algorithms, and hybrid evolutionary-local search demonstrate that the proposed framework yields robust and improved search performance.

Outstanding Chapter Award

CIS Singapore Chapter, SINGAPORE
The CIS Singapore Chapter, Chaired by Professor Meng Joo Er, Director of

Renaissance Engineering Programme, Nanyang Technological University, Singapore, is one of the fast growing chapters in the IEEE Computational Intelligence Society.

Outstanding Ph.D. Dissertation Award

Dongrui Wu for his thesis entitled “Intelligent Systems for Decision Support” presented for the degree of Doctor of Philosophy in the University of Southern California, USA, May 2009.

Abstract – This research is focused on multi-criteria decision-making (MCDM) under uncertainties, especially linguistic uncertainties. This problem is very important because many times linguistic information, in addition to numerical information, is an essential input of decision-making. Linguistic information is usually uncertain, and it is necessary to incorporate and propagate this uncertainty during the decision-making process because uncertainty means risk. MCDM problems can be classified into two categories: 1) multi-attribute decision-making (MADM), which selects the best alternative(s) from a group of candidates using multiple criteria, and 2) multi-objective decision-making (MODM), which optimizes conflicting objective functions under constraints. Perceptual Computer, an architecture for computing with words, is implemented in this dissertation for both categories. For MADM, we consider the most general case that the weights for and the inputs to the criteria are a mixture of numbers, intervals, type-1 fuzzy sets and/or words modeled by interval type-2 fuzzy sets. Novel weighted averages are proposed to aggregate this diverse and uncertain information so that the overall performance of each alternative can be computed and ranked. For MODM, we consider how to represent the dynamics of a process (objective function) by IF-THEN rules and then how to perform reasoning based on these rules, i.e., to compute the objective function for new linguistic inputs. Two approaches for extracting IF-THEN rules are also proposed: 1) linguistic summarization to

extract rules from data, and 2) knowledge mining to extract rules through survey. Applications are shown for all techniques proposed in this dissertation.

Outstanding Organization Award

The European Centre for Soft Computing, SPAIN

The European Centre for Soft Computing (ECSC) is a research and development centre with the structure of a private foundation, created in 2006 and located in Mieres, Asturias (Spain). Its main objectives are basic and applied research in the area of Soft Computing/ Computational Intelligence (SC/CI), technology transfer of industrial applications of intelligent systems, training, and dissemination. A Scientific Committee guides the scientific activities of the Centre. The Centre also seeks to become a meeting point for worldwide experts and a place where PhD students and young researchers can engage in advanced research and development activities.

The centre is composed of a research team that includes thirty people from all over the world, plus a management, administrative, and ICT support team of fifteen people, including a software development unit. The research team includes well-known researchers, such as Enrique Ruspini, Michio Sugeno, Enric Trillas, Claudio Moraga, Oscar Cordon, Christian Borgelt, and Rudolf Seising, working together with young researchers in five research units characterized by a strongly interactive and synergistic approach to SC/CI.

Since its creation the centre has been involved in over forty research projects and contracts with private and public (regional, national and European) funding, coordinating several European consortia. As a result, six Patents have been registered, three of them developed with or licensed by companies. ECSC collaborates with or performs services for more than thirty companies, including top firms such as INDRA, Telefónica de España, OHL, EDP Renewables, and REPSOLYPF.

The Centre launched a European Master in Soft Computing and Intelli-

gent Data Analysis and has organized different scientific conferences and congresses as well as several Summer Courses with the financial support of the European Union. In cooperation with Cajastur (Asturias Savings Bank) the ECSC created the Cajastur Mamdani Prize for Soft Computing (now in its fifth edition).

In summary, since its inception five years ago, the European Centre for Soft Computing has been involved in a vast array of activities that includes research, innovation, education and dissemination of soft computing and computational intelligence. Its guiding purpose has been the development of a framework to raise awareness of SC/CI at the social, educational, and business levels. While focusing on SC/CI, however, it has sought a higher, broader, goal, that of promoting science and innovation in a changing Society.

Outstanding Early Career Award

Kay Chen Tan, National University of Singapore, SINGAPORE

For contributions to evolutionary computation in multi-objective optimization.



Kay Chen Tan is currently an Associate Professor in the Department of Electrical and Computer Engineering at the National University of Singapore (NUS). He is actively pursuing research in the field of computational intelligence, with applications to multi-objective optimization, scheduling, design and automation, data mining, and games.

Dr Tan has published over 100 journal papers, over 100 papers in conference proceedings, co-authored 5 books including *Multiobjective Evolutionary Algorithms and Applications* (Springer-Verlag, 2005), *Modern Industrial Automation Software Design* (John Wiley, 2006; Chinese Edition, 2008), *Evolutionary Robotics: From Algorithms to Implementations* (World Scientific, 2006; Review), *Neural*


Networks: Computational Models and Applications (Springer-Verlag, 2007), and *Evolutionary Multi-objective Optimization in Uncertain Environments: Issues and Algorithms* (Springer-Verlag, 2009), co-edited 4 books including *Recent Advances in Simulated Evolution and Learning* (World Scientific, 2004), *Evolutionary Scheduling* (Springer-Verlag, 2007), *Multiobjective Memetic Algorithms* (Springer-Verlag, 2009), and *Design and Control of Intelligent Robotic Systems* (Springer-Verlag, 2009).

Dr Tan has been invited to be a keynote/invited speaker for over 20 international conferences. He served in the international program committee for over 100 conferences and involved in the organizing committee for over 40 international conferences, including the General Co-Chair for IEEE Congress

on Evolutionary Computation 2007 in Singapore and the General Co-Chair for IEEE Symposium on Computational Intelligence in Scheduling 2009 in Tennessee, USA. Dr Tan is a Distinguished Lecturer of IEEE Computational Intelligence Society (CIS) since 2011. He was the Chairman of CIS Evolutionary Computation Technical Committee and CIS Singapore Chapter.

Dr Tan is currently the Editor-in-Chief of *IEEE Computational Intelligence Magazine (CIM)*. He also serves as an Associate Editor/Editorial Board member of over 15 international journals, such as *IEEE Transactions on Evolutionary Computation*, *IEEE Transactions on Computational Intelligence* and *AI in Games*, *Evolutionary Computation* (MIT Press), *European Journal of Operational Research*,

Journal of Scheduling, and *International Journal of Systems Science* etc.

Dr Tan is the awardee of the 2012 IEEE CIS Outstanding Early Career Award for his contributions to evolutionary computation in multi-objective optimization. He also received the Recognition Award (2008) from the International Network for Engineering Education & Research (iNEER) for his outstanding contributions to engineering education and research. He was also a winner of the NUS Outstanding Educator Awards (2004), the Engineering Educator Awards (2002, 2003, 2005), the Annual Teaching Excellence Awards (2002, 2003, 2004, 2005, 2006), and the Honour Roll Awards (2007). Dr Tan is currently a Fellow of the NUS Teaching Academic. 

Editor's Remarks (continued from page 2)

been made possible because of the active participations and contributions of everyone. I hope you will keep the feedback and comments coming in so that we can continuously improve the quality of this flagship magazine and bring it to greater heights.

The upcoming flagship event of our society—IEEE World Congress on Computational Intelligence (WCCI)—will be held from June 10–15, 2012 at the Brisbane Convention & Exhibition Centre, Australia. This will be the largest

technical event in the field of computational intelligence which will serve as a forum for all of us to discuss and present new research findings. Do mark your calendars as we look forward to seeing you at the congress next year!

As 2011 comes to an end, let's take time to celebrate the successes of the year and reflect on what we could have done better as we move forward to a new year in 2012. It has been an enjoyable and rewarding time for me to work with so many esteemed members and volunteers

of IEEE, and I would like to express my appreciation to everyone who has contributed to the production of this magazine, particularly Jessica Barragué and Kheng Im, for their tireless efforts and behind-the-scenes work for the magazine.

Season's Greetings, Be Healthy, and Happy Holidays!

K. C. Tan 