

CONTENTS IN THIS ISSUE

End of Term Message from the INNS President - Nikola Kasabov	1
INNS Awards for 2011 - Leonid Perlovsky	2
INNS Awards Acceptance Statements - Jack Cowan, Robert Kozma, & Weifeng Li	3
APNNA Awards for 2010 - Soo-Young Lee	4
Report: INCF Congress on Neuroinformatics 2010 - Shiro Usui	6
Report: Computational Intelligence for Bioinformatics & Biostatistics - Riccardo Rizzo	7
Report: INNS Workshop and the Formation of SIG-India - Suash Deb	8
Report: INNS SIG on Eng. Applications of Neural Networks - Chrisina Jayne & Dominic Palmer-Brown	9
Journal Announcement: Evolving Systems - Plamen Angelov	9
Article: Artistic Complexity and Brain: Quantitative Measurements of Creativity - Francesco Carlo Morabito	10
Upcoming Meetings: Distributed Machine Learning and Sparse Representation with Massive Data Sets - Oliver Obst	12
Upcoming Meeting: INNS Educational Symp. on Neural Networks - Lind Potchoiba and Danil Prokhorov	12
Upcoming Meeting: IEEE Symposium on Computational Intelligence - Martine De Cock	13
Upcoming Meeting: International Symp. on Neural Networks - Derong Lu	14
Upcoming Meeting: Neuromorphic Cognitive Engineering Workshop - Ralph Etienne-Cummings	14
Upcoming Meeting: Evolving & Adaptive Fuzzy Systems - Plamen Angelov, Dimitar Filev, Nik Kasabov	15
Upcoming Meeting: International Joint Conf. on Neural Networks - Ali Minai	16
Editors' Address - Soo-Young Lee, Robert Kozma, and Harold Szu	16
Upcoming Meeting: International Conf. on Neural Information Proc. and Post-Conf. Workshop - Bao-Liang Lu and Paul Pang	17

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END OF TERM MESSAGE FROM THE INNS PRESIDENT

Nikola Kasabov



It was a privilege to serve as the INNS President for the last two years – 2009 and 2010.

INNS is a professional home for many academics, researchers and practitioners from all over the world who work in the areas of brain science, neuroscience, brain information processing, cognitive science, brain-like computing, neuroinformatics and bioinformatics, neural network models and systems, applications in science, engineering, business and other areas. New research topics have recently emerged, such as neuro-genetic modeling, mental development in robots, quantum and field information processing.

In the past 2 years INNS has expanded to include new Special Interest Groups (SIG) in addition to the existing ones. I will only mention three of them. The new SIG on Autonomous Mental Development, organized and chaired by Asim Roy, quickly grew to more than 90 members now. The new SIG on Engineering Applications of ANN, organized and chaired by Dominique Palmer-Brown and Chrisina Draganova from London, has already organized a conference EANN and a Workshop, attended by more than 100 participants. The existing SIG Bioinformatics, chaired by Francesco Masuli and Roberto Tagliaferry, held two Symposia with international participation.

I am also glad that in addition to the existing INNS regional chapters (RC) we succeeded to form two new important ones. The India RC was organized and is chaired by Suash Debb. They had a founding Workshop in November 2010 in Nagpur on the topic 'New Developments in ANN' (see the material inside this Newsletter). An upcoming INNS Education Symposium, to be held in Lima, January 2011, will formalize the formation of a RC in Latin America. We are making efforts to come up with a significantly reduced and subsidized membership fee for members from developing countries.

In the last 2 years we have worked in a very close and productive collaboration with a number of professional societies and organizations, such as: IEEE Computational Intelligence Society (Presidents David Fogel – 2009 and Garry Yen - 2010); the European Neural Network Society (ENNS) (President Wlodech Duch), the Japanese Neural Network Society (JNNS) (President Hirai), the Asia-Pacific Neural Network Assembly (APNNA) (Presidents J.Chen – 2009 and T.Gedeon – 2010).

In collaboration with the IEEE CIS we organized successfully the premier International Joint Conference on Neural Networks, IJCNN in 2009

(Atlanta, Georgia, Chair Robert Kozma) and co-organised IJCNN 2010 (Barcelona, Chair Vincenzo Puri). The upcoming IJCNN 2011 is chaired by Ali Minai and will be held in San Jose, 29.07-4.08.2011. Both 2009 and 2010 IJCNN conferences have been of a very high quality and attended well. We have even higher expectations for the upcoming IJCNN 2011 and IJCNN 2012 (Brisbane, Australia).

Jointly with ENNS and JNNS, we publish through Elsevier Science one of the premier journals in this area - Neural Networks. This journal will continue to publish state-of-the art publications under the co-editorship of leading scientists – DeLiang Wang, Kenji Doya and John Taylor, with Stephen Grossberg staying on board as the Founding Editor-in Chief. Our tri-society Newsletter, published in 2 volumes per year, has been and will continue to inform our members about global and regional activities and scientific news.

The society values and rewards the contribution of its members. INNS offers a recognition and progression scheme from student, affiliate and regular members, to Senior Members and Members of the College of Fellows. The society presents prestigious Awards annually, such as the Hebb Award, the Helmholtz Award, the Gabor Award and the Young Investigator Award. Among the Awardees in 2009 and 2010 were the leading NN scientists: Shun-ichi Amari, Bernard Widrow, Michael Arbib, Erkki Oja, Robert Desimone, Frank Lewis, Kenji Morita, Colin Molter.

Our vision is to continue the development of INNS as truly international, interdisciplinary and inclusive society.

Our goals to understand the information processes in the brain and to create more powerful brain-like machines for solving complex problems of the 21st century are very challenging indeed, but I am sure that with the joined efforts of all INNS members we will make a significant progress in the years to come.

As the INNS President for 2009 and 2010 I have received a tremendous support from the Board of Governors, especially from the Vice Presidents Membership Fred Ham and Jose Principe, the Vice President Conferences Danil Prokhorov, the Treasurer Dave Cassant, the Executive Director Bruce Wheeler, the Secretary Ali Minai. I trust that the new President Ron Sun, who has all my support, will lead the Society to a further success.

I thank you all for your support in the last two years and am looking forward to working with you in the future!

December 2010 ■

INNS AWARDS FOR 2011

Leonid Perlovsky, Ph.D.
Chair of the Awards Committee of the INNS

As the chair of the Awards Committee of the INNS, I am pleased and proud to announce the recipients of the 2011 INNS Awards:

2011 **Hebb Award** goes to: **Paul Werbos**

2011 **Helmholtz Award** goes to: **Jack Cowan**

2011 **Gabor Award** goes to: **Robert Kozma**

2011 **INNS Young Investigator Awards** go to: **Damien Coyle and Weifeng Liu**

These awards were decided after careful deliberations by the Awards Committee and the Board of Governors.

Paul Werbos, the Hebb Award recipient, is recognized for his long-standing contribution and achievements in biological and computational learning.

Jack Cowan, the Helmholtz Award recipient, is recognized for his many years of contribution and achievements in understanding sensation/perception.

Robert Kozma, the Gabor Award recipient, is recognized for his achievements in engineering/application of neural networks.

Damien Coyle and Weifeng Liu, the Young Investigator Award recipients, are recognized for significant contributions in the field of Neural Networks by a young person (with no more than five years postdoctoral experience and who are under forty years of age).

These awards will be presented at IJCNN 2011 in San Jose. ■



LET'S CONGRATULATE THE AWARDEES!

Paul Werbos **Recipient of 2011 INNS Hebb Award**

Paul Werbos began training as a mathematician, taking many university courses culminating in the graduate course in logic from Alonzo Church at Princeton while in middle and high school. Realizing the limits of deductive logic, he began his quest to understand inductive logic and intelligence in the mind back in those days, inspired by the work of John Von Neumann, Donald Hebb and early AI (Feigenbaum and Feldman). He obtained two degrees in economics from Harvard and the London School of Economics, divided equally between using mathematical economics as a model for distributed intelligence and developing some broader understanding. For his Harvard M.S., he took courses in quantum field theory (QFT) from Julian Schwinger, but did not fully understand the subject until many years later, after he started an activity in quantum technology and modeling at NSF (see his papers at <http://arxiv.org>.) For his 1974 Harvard PhD thesis (reprinted in *The Roots of Backpropagation*, Wiley 1994), he proposed the development of more powerful, more biologically plausible reinforcement learning systems by the then new idea of using neural networks to approximate dynamic programming (ADP), including the value function. In order to implement ADP in a local biologically plausible manner, he translated Freud's theory of "psychic energy" into an algorithm later called backpropagation, and a rigorous general theorem, the chain law for ordered derivatives, which later also became known as the reverse method or adjoint method for automatic or circuit-level differentiation. He has spent many years advancing the fields of ADP and backpropagation and brain-like prediction, aimed at developing and demonstrating the kind of designs



which could actually explain the kind of general intelligence we see in the brain and in subjective human experience – collaborating at times with Karl Pribram and Walter Freeman and Pellionisz among others, and proposing biological experiments to test the theory. In looking for applications which are really important to areas like energy, sustainability and space, he has also gotten deep into domain issues and organization, as reflected at www.werbos.com, serving on boards of the National Space Society, the Millennium Project, the Lifeboat Foundation, and the IEEE Energy Policy Committee, and as a Fellow in the Senate in 2009. From 1980-1989, he developed econometric forecasting models (two based on backpropagation) and was lead analyst for the long-term future at EIA in the Department of Energy.

Jack Cowan **Recipient of 2011 INNS Helmholtz Award**

Jack Cowan is a Professor in the Mathematics Department of the University of Chicago. He also has a joint appointment in the Committee on Computational Neuroscience. He was born in the UK and educated both in the UK and at MIT. In 1967 he and his family moved from London to Chicago where he became Professor and Chairman of the Committee on Mathematical Biology. Since 1981 he has been a Professor in the Mathematics Department. Over the past fifty years Jack Cowan has worked on a variety of mathematical topics including how to build reliable computers with unreliable elements, the population dynamics of large-scale neural networks, and (for the past thirty-five years) the statistical mechanics of networks of neuron-like elements. His main contributions have been the formulation of the sigmoid firing rate model, and (with Hugh Wilson) of what are now known as the Wilson-Cowan equations, which capture the attractor dynamics of neural networks, his work with Bard Ermentrout on their mathematical analysis, his work with Paul Bressloff, Martin Golubitsky, and others on modeling the structure and dynamics of the primate visual cortex, and (more recently) his work with Michael Buice and others on the statistical mechanics of neural networks. He is perhaps best known for the Wilson-Cowan equations, and for his work on Geometric Visual Hallucinations (started with Ermentrout), and what they tell us about the human brain.



Robert Kozma **Recipient of 2011 INNS Gabor Award**

Robert Kozma is William Dunavant Jr. University Professor of Mathematical Sciences, The University of Memphis, Memphis, TN. He is Director of the Center for Large-Scale Integrated Optimization and Networks (CLION), at the FedEx Institute of Technology, Memphis, TN, USA. CLION is an academic-industry-government partnership focusing on the development and commercialization of intelligent optimization techniques in the mid-South region and nationwide. He has 30 years of research in advanced signal processing and intelligent systems design and analysis, computational brain study, knowledge acquisition and autonomous decision making in animals and animats.



Dr. Kozma holds PhD degree in Physics (1992, Delft University of Technology, The Netherlands) and two M.Sc. Degrees; in Mathematics with distinction (1988, Eotvos University, Budapest, Hungary) and in Engineering Physics with honor (red diploma) (1982, Moscow Institute of Power Engineering, Russia, Soviet Union), respectively. He has been associate professor at the Department of Quantum Science & Engineering (Tohoku, Japan), lecturer at the Department of Information Sciences (Otago University, New Zealand). He has held visiting positions at the Division of Neuroscience, Department of Molecular and Cell Biology, and Department of EECS of at the University of California at Berkeley, CA; Sarnoff Co., Princeton, NJ, AFRL/RHYE, NASA Jet Propulsion Research Laboratory, Pasadena, CA, and other academic and research institutions.

Dr. Kozma pioneered the approach 'neuropcolation' to large-scale brain dynamics by replacing ordinary differential equations with phase transitions in random graph theory. He implemented the theory in robotic hardware embodiment by inventing an artificial brain with unique capabilities of decision support and sensory fusion.

Damien Coyle
Recipient of 2011 INNS Young Investigator Award



Dr. He is currently a Lecturer at the School of Computing and Intelligent Systems and a member of the Intelligent Systems Research Centre at the University of Ulster. His research interests include biosignal processing and bio-inspired cognitive and adaptive systems for brain-computer interface technology. His main research focus is on developing computational intelligence (CI) based approaches to tackle complex biosignal analysis and discrimination for brain-computer interface (BCI) technology. In particular he has focused on developing self-organizing fuzzy neural networks and a novel prediction framework for preprocessing sensorimotor induced EEG oscillations. Dr Coyle is working on a range of medical and non- medical applications of BCI including neurofeedback for stroke rehabilitation, neural prostheses and assistive robotics and applying biosignal processing tools in other healthcare domains. He is also involved in the development of BCI controlled computer games. More recently he has been investigating computational models of functional and dysfunctional neural systems and neurodegeneration related to Alzheimer's disease (AD).

Current project includes

- Brain-Computer Interface - experimentation, clinical trials management and applications development
- Biomedical imaging methods for studying cerebral cortex changes in Alzheimer's Disease
- Neural Dynamics underlying brain Thalamic Oscillations in Motor Control and Memory Storage/Recall using Lumped Neuron Models
- Investigating the Neural Correlates of Alzheimer's Disease with Computational Models
- Integration of EEG and fMRI for Developing Models of Neurodegeneration
- BCI-robot - Brain-Computer Interface - Controlling Robots using Brainwaves
- The impact of menopause and HRT use on Everyday working memory and Event Related Potentials (ERP) in clinical and non-clinical populations.
- Brain Computer Interfaces for Natural Communication
- Fast Adaptive Signal Processing for Intelligent Multistate Self-Paced BCIs
- Using BCI-based Neurofeedback for Stroke Rehabilitation

Dr. Coyle chairs the IEEE Computational Intelligence Society (CIS) UKRI Chapter (2008-present), the IEEE CIS GOLD (graduates of the last decade) subcommittee (2008-present) and the IEEE CIS Brain-Computer Interface Task Force (BCITF) (2008-present) and is a member of IEEE CIS Awards committee (2008-2010) and the Video Competition adhoc committee. He is incoming IEEE CIS chapter subcommittee chair for 2011 He is also a member of the executive committee of the IEEE Engineering and Biology Society (UK&RI Chapter) and a member of International Neural Network Society (INNS), the Institute of Technology and Engineering (IET) and the Isaac Newton Institute for Mathematical Sciences.. He is currently working on research grants worth approx £1.75 million which are funded by the Department of Education and Learning Northern Ireland (DELNI), the UK Engineering and Physical Sciences Research Council (EPSRC) and a UKEIRI project co-funded by the UK and Indian governments. Dr. Coyle has received a number of awards for his research including the IEEE Computational Intelligence Society Outstanding Doctoral Dissertation Award in 2008 and now the International Neural Network Society's 2011 Young Investigator Award.

Further details can be found here - <http://isc.ulster.ac.uk/Staff/DCoyle/>.

Weifeng Liu
Recipient of 2011 INNS Young Investigator Award



Dr. Weifeng Liu received the Ph.D. degree in electrical and computer engineering from University of Florida, USA with a focus on adaptive filtering theory in reproducing kernel Hilbert spaces. He is currently a research scientist at Amazon.com Inc. where he investigates large-scale distributed machine learning and data mining systems. He is a member of IEEE Signal Processing Society Machine Learning for Signal Processing Technical Committee. He has served on the editorial board of the Neural

Processing Letters journal and has been technical committee members for several international conferences including IEEE International Workshop on Machine Learning for Signal Processing, International Conference on Artificial Neural Networks, and IEEE World Congress on Computational Intelligence. His research areas include signal processing, adaptive filtering and machine learning. Dr. Liu has authored or co-authored 3 US patents, 5 book chapters, 9 peer-reviewed journal papers and 10 conference papers. Recently, he co-authored a book entitled "Kernel Adaptive Filtering: A Comprehensive Introduction" published by Wiley, 2010. ■

INNS AWARD ACCEPTANCE STATEMENT:

Helmholtz Awardee – Jack Cowan

I am very pleased indeed to receive the 2011 Helmholtz Award. I thank the INNS community for this, especially since I have always admired Helmholtz's approach to science, in particular his work on sensation and perception.

I first became interested in these topics during my time as a graduate student under the guidance of Gabor (1956-57), Shannon, (1958-62), Wiener (1958-61), and McCulloch & Pitts (1960-62). Largely under the influence of Pitts and Wiener, I started in 1962 to try to understand the large-scale dynamics of cortical networks, with the goal of eventually linking brain dynamics to psychological processes. Based on my early training in physics and electrical engineering I sought to use the methods of theoretical physics to achieve such a goal.

My first approach was based on an analogy that I perceived existed between networks of interacting excitatory and inhibitory neurons, and predator-prey interactions in population biology described by the Lotka-Volterra equations. The result was the sigmoid firing rate model (1967-1971), which later became the basis for Hopfield networks, and for the Rumelhart-Hinton-Williams solution of the Perceptron algorithm for arbitrary networks of sigmoid neurons.

My second approach was based on a population approach to such sigmoid networks, carried out with my postdoctoral fellow at the University of Chicago, Hugh Wilson. The resulting Wilson-Cowan equations (1972-1973) have proved to be very influential in modeling large-scale activity, and can indeed be used to analyze many psychological processes. In later work with my graduate student Bard Ermentrout, (1979-1981) we analyzed the dynamics of interacting neural populations using the methods of bifurcation theory, combined with the theory of symmetry groups. Among the problems that Ermentrout and I tackled, was that of providing a neural theory for the emergence of geometric visual hallucinations. We thus began to approach some of the issues raised by Helmholtz over a century earlier.

However, even in the early 1970s I knew that the approach described in the Wilson-Cowan equations was inadequate to describe what happens in real neural networks. The reason is that such equations are mean-field equations, in which the effects of fluctuations and correlations are ignored. It was not until 1985 that I finally saw how to approach this problem, and it was not until 2005 while working with my graduate student Michael Buice (2002-2005) that we worked out the solution. In essence we mapped the mathematics of stochastic neural networks and populations into a form of percolation theory called directed percolation (Buice & Cowan 2007, 2009, Buice, Cowan and Chow 2010, Benayoun, Cowan, Van Dronghelen, & Wallace 2010). Sitting inside brain dynamics is a directed percolation phase transition: one can organize and understand much of brain dynamics around such a property. I am presently hard at work on this and related topics. ■

INNS AWARD ACCEPTANCE STATEMENT:

Gabor Awardee – Robert Kozma

I am humbled to receive this award recognizing research on applying neural networks. Our field of neural networks is rapidly developing and there are ample of outstanding research achievements deserving such honor. I would like to thank for the support of INNS towards my research accomplishments by selecting me for this year's Gabor award.

Among the many revolutionary research achievements in neural networks, the work I am conducting on graph theoretical and network science aspects of neural networks has serious practical implications. The lack of efficient implementations of neural network models often hampers and prevents the practical use of otherwise outstanding neural and brain theories. My work on random graph models of brain functions has direct relevance to this challenging issue. The corresponding research area is

now called 'neuropercolation.' Neuropercolation uses the tools of mathematical theory of percolations over graphs and lattices to describe the propagation of neural activations across the cortex. Neuropercolation is the extension of Von Neumann's work on computing and brains, Conway's game-of-life, and Chua's cellular neural networks. Since my high-school years, when I have read Neumann's posthumous essay "The computer and the brain," I wanted to work on the implementation of his brilliant ideas described in that book. I consider neuropercolation is an approach, which is a logical extension of Neumann's tragically unfinished ideas on computers, cellular automata, mathematics and the language of the brain. Neuropercolation aids efficient implementations of brain theories by substituting ordinary and partial differential equations by evolutionary processes over large-scale random graphs and random cellular automata. The applications include embedded cognition, robot control and navigation, intelligent distributed sensor systems, decision support, just to mention a few areas.

It would have been impossible to accomplish these results without my excellent teachers, mentors, and collaborators, with whom I had the opportunity to work with in Hungary, Russia, The Netherlands, Japan, New Zealand, and the USA. In developing neuropercolation and its implementations in the framework of the hierarchy of Freeman's K (Katchalsky) sets, I have been fortunate to collaborate with Walter Freeman, Bela Bollobas, Paul Balister, Peter Erdi, Marko Puljic. I want to express my sincere gratitude to them. The award is equally theirs, just as it is mine, and I hope we will be able to continue to work together on further neural networks implementations in the years to come. ■

INNS AWARD ACCEPTANCE STATEMENT:
Young Investigator Awardee – Weifeng Liu

I am really honored to receive the INNS Young Investigator award. I want to thank the INNS Awards Committee and the Board of Governors for this prestigious award and for the recognition of the

work I have done so far together with many dear friends, colleagues and mentors, to whom I am deeply grateful.

I have been working with Prof. Jose C. Principe at the University of Florida and Prof. Simon Haykin at McMaster University on the adaptive filtering theory in reproducing kernel Hilbert spaces. The linear adaptive filtering theory, which was pioneered by Prof. Bernard Widrow at Stanford University 60 years ago, has found its wide applications in numerous places. These simple, yet powerful adaptive filters interested me when I was a graduate student of Prof. Jose C. Principe, who was then enthusiastically pursuing optimal nonlinear adaptive filters. With his help and encouragement, I played with various mathematical approaches to go beyond the linear Gaussian model for adaptive filters, including information theoretic learning and kernel methods. It turned out that almost all of the classical adaptive filtering algorithms can be elegantly framed in reproducing kernel Hilbert spaces.

We collectively named these algorithms as kernel adaptive filters, which form an elegant, unified theory for the algorithmic implementation of nonlinear adaptive filters. It is elegant because it builds on the Mercer theorem, which is basic to the well-established kernel methods. Moreover, it is unified in that it builds upon and encompasses all the powerful linear adaptive filtering algorithms as special cases. As summarized by Prof. Simon Haykin in our newly published book (Kernel adaptive filtering, Wiley, 2010), "(with the kernel adaptive filters), it can be justifiably said that at long last we now have the elegant, unified theory that has been lacking in the literature for much too long."

A solid theoretical foundation of nonlinear adaptive filtering has been laid down and a rosy picture of nonlinear information filtering has been painted. However, the path to a greater success is still suffering from pitfalls and road blocks. I feel no fear but privileged because I am living at the heyday of the machine learning field and accompanied with the brightest minds in this journey. ■

APNNA AWARDS FOR 2010

Soo-Young Lee

At the Governing Board Meeting of APNNA (Asia-Pacific Neural Network Assembly) on November 23, 2010, during ICONIP2010 at Sydney, Australia, Dr. Shun-ichi Amari, the Awards Committee Chair, had reported the decision of the Committee on 2010 APNNA Awards, and the Board approved the Awards.

Prof. **Shiro Usui** of the RIKEN Brain Science Institute, Japan, is the recipient of 2010 **APNNA Outstanding Achievement Award** for his pioneering and fundamental contributions to Neuroinformatics.

Prof. **Irwin King** of Chinese University of Hong Kong, Hong Kong, is the recipient of 2010 **APNNA Excellent Service Award** for his great contribution and service to APNNA.

Drs. **Shuji Satoh** and **Jun-nosuke Teramae** are the recipients of 2010 **APNNA Young Investigator Awards**.

From 2004 only one APNNA Outstanding Achievement Award was given each year, while maximum two Awards were given to APNNA Excellent Service Award. APNNA had started giving Young Investigator Awards from this year, and maximum two awards shall be given each year.

The Awards were given by Tom Gedeon, the President of APNNA, at the ICONIP Banquet on November 24, 2010.

Shiro Usui and Tom Gedeon



Irwin King and Tom Gedeon



Jun-nosuke Teramae and Tom Gedeon

Shuji Satoh and Tom Gedeon



Brief bio-sketches of the APNNA Awardees are given as follows:

Shiro Usui
Recipient of 2010 APNNA Outstanding Achievement Award

Neuroinformatics is a powerful method that allows us to understand the mechanisms of the brain. It is indispensable to combine various pieces of knowledge on the brain and to construct mathematical models to describe the essence of the brain.

Professor USUI is the most important pioneer and contributor in the field who has been leading this growing area by advocating the importance of knowledge integration, developing platforms such as PLATO and XooNlps, and published many significant research findings. Standing at the intersection of neuroscience and information science, he also supports wide researchers developing and maintaining neuroscience databases, provides a portal for the platforms, and designs the infrastructure for Neuroinformatics.

On Neuroinformatics, he gave a number of invited lectures at ICONIP, IJCNN, and various important conferences. He also received many significant awards such as the ICONIP 2009 Best Paper Award, JNNS 2009 Best Paper Award, and IJCNN 2007 Best Paper Award.



Irwin King
Recipient of 2010 APNNA Excellent Service Award

Dr. King's research interests include machine learning, web intelligence, social computing, data mining, and multimedia information processing. In these research areas, he has over 200 technical publications in journals (JMLR, ACM TOIS, IEEE TNN, Neurocomputing, NN, IEEE BME, PR, IEEE SMC, JAMC, JASIST, IJPRAI, DSS, etc.) and conferences (NIPS, IJCAI, CIKM, SIGIR, KDD, PAKDD, ICDM, WWW, WI/IAT, WCCI, IJCNN, ICONIP, ICDAR, etc.). In addition, he has contributed over 20 book chapters and edited volumes. Moreover, Dr. King has over 30 research and applied grants. One notable patented system he has developed is the VeriGuide System, previously known as the CUPIDE (Chinese University Plagiarism IDentification Engine) system, which detects similar sentences and performs readability analysis of text-based documents in both English and in Chinese to promote academic integrity and honesty.



Dr. King is an Associate Editor of the IEEE Transactions on Neural Networks (TNN) and IEEE Computational Intelligence Magazine (CIM). He is a member of the Editorial Board of the Open Information Systems Journal, Journal of Nonlinear Analysis and Applied Mathematics, and Neural Information Processing—Letters and Reviews Journal (NIP-LR). He has also served as Special Issue Guest Editor for Neurocomputing, International Journal of Intelligent Computing and Cybernetics (IJICC), Journal of Intelligent Information Systems (JIIS), and International Journal of Computational Intelligent Research (IJ CIR). He is a senior member of IEEE and a member of ACM, International Neural Network Society (INNS), and Asian Pacific Neural Network Assembly (APNNA). Currently, he is serving the Neural Network Technical Committee (NNTC) and the Data Mining Technical Committee under the IEEE Computational Intelligence Society (formerly the IEEE Neural Network Society). He is also a member of the Board of Governors of INNS and a Vice-President and Governing Board Member of APNNA.

He is serving or has served as program and/or organizing member in numerous top international conferences and workshops, e.g., WWW, ACM MM, CIKM, ICME, ICASSP, IJCNN, ICONIP, ICPR, etc. He has also served as reviewer for international conferences as well as journals, e.g., Information Fusion, IEEE TCAS, SIGMOD, IEEE Transactions on Neural Networks, IEEE Pattern Analysis and Machine Intelligence, IEEE Transactions on Multimedia, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on System, Man, and Cybernetics, Machine Vision and Applications, International Journal of Computer Vision, Real-Time Imaging, SPIE Journal of Electronic Imaging, International Journal of Pattern Recognition and Artificial Intelligence, etc.

Dr. King has received several exemplary teaching and service awards from the Department as well as from the Faculty of Engineering. He serves as a member of the Engineering Panel with the Research Grants

Council (RGC), Hong Kong SAR Government. He is also the Director of the International Programmes in the Engineering Faculty. In addition, he is a member of the Faculty Curriculum Committee and serves as the Chair of the Curriculum Committee for the department. Dr. King is also actively involved in education of students outside of the classroom. For example, he has led several ACM Programming Contest Teams to the ACM ICPC World Finals since 2000. Moreover, he actively promotes the use of technologies in education. One great example is VeriGuide, which is a system that promotes academic honesty and integrity through the use of advanced information retrieval techniques to locate similar texts. The VeriGuide system is being deployed at the Chinese University with over 14,000 student, faculty, and staff members. The system is also being used in a number of local secondary schools.

Dr. King joined the Chinese University of Hong Kong in 1993. He received his B.Sc. degree in Engineering and Applied Science from California Institute of Technology, Pasadena and his M.Sc. and Ph.D. degree in Computer Science from the University of Southern California, Los Angeles.

Shuji Satoh
Recipient of 2010 APNNA Young Investigator Award

Shunji SATOH is Associate professor in the Graduate School of the University of Electro-Communications, JAPAN, and actively working for the researches on visual information processing and has already proposed several new ideas.



His computational research for vision is science as well as engineering. He has shown unique computational theories and biologically plausible models that are effective algorithms for natural image analysis (engineering), and proposed novel theories that account for complex properties of neurons (science) [1,2]. It should be emphasized that such engineering (technical) and scientific contributions stem from a single theory [1,2]. Moreover, he conjectured the existence of undiscovered visual properties from theoretical analysis of his model. He and his colleagues have shown the validity of this conjecture by psychological experiments [3]. That is, he has tried to find a unified theory of vision that is applicable for technical method for image processing, neurophysiology and psychophysics. One of his theories for vision will be registered as a new patent (under review).

Jun-nosuke Teramae
Recipient of 2010 APNNA Young Investigator Award

It has been a big issue how the brain makes use of stochastic and deterministic information processing. It is widely believed that stochastic fluctuations are ubiquitous in vivo brains. However, Mainen and Sejnowski reported in 1995 that single neurons emit spikes in exactly the same timing for the same input sequence. This finding raised a fundamental debate on neuroscience concerning the timescales of spikes responsible for information. This is related to the debate of the temporal and rate codings.



Dr. Teramae has given a fundamental solution to this intriguing question in his 2004 and 2008 papers. His idea is based on the stochastic entrainment of spikes from a nonlinear neuron under a random input noise sequence. This is named the noise-induced synchronization, implying that, given the same input sequence, the responses of a single neuron become always the same after short transient period. He used the stochastic differential equation together with the phase response curve analysis, deriving the epoch-making results. He further studied in his 2008 paper that this phenomenon does not necessarily happen for a network of mutually connected neurons, so that stochastic phenomena dominate, as is seen in vivo networks. His theory explains clearly why stochastic phenomena are ubiquitous in vivo networks even when a single cell behaves deterministically.

In addition to these two outstanding papers, he has published a considerable number of high level research works in top-class journals. They include the mechanism of synchronizations in various networks, neuronal avalanches, and dynamics of associative memory. ■

Shiro Usui

The INCF (International Neuroinformatics Coordinating Facility) is a professional organization devoted to catalyze and coordinate the global development of neuroinformatics in the scientific community. One of its aims is to develop an international neuroinformatics infrastructure, which promotes the sharing of neuroscience data and computing resources such as application of computational models and analytical tools to the international research community. INCF is funded by contributions from 16 member countries: Belgium, Czech Republic, Finland, France, Germany, India, Italy, Japan, Netherlands, Norway, Poland, South Korea, Sweden, Switzerland, United Kingdom and United States (details can be seen at <http://www.incf.org/about/nodes>). INCF's mission includes to foster scientific interaction through information flow within its global network, valuating neuroinformatics activities and infrastructures and to facilitate training in neuroinformatics. INCF has also identified its values which include openness, neutrality and stability and aims to implement its vision, mission and values through the Core Activities:

- INCF Programs (<http://www.incf.org/core/programs/incf-program-areas>),
- Workshops (<http://www.incf.org/core/incf-topical-workshops/incf-workshops>)
- Neuroinformatics Congress (<http://www.incf.org/core/incf-congress>).

The annual INCF Neuroinformatics Congress provides a meeting place for researchers in all fields related to neuroinformatics, including data- and knowledge-bases of the nervous system from molecular to behavioral levels; tools for the acquisition, analysis, and visualization of nervous system data; and theoretical, computational, and simulation environments for modeling the brain. Participants' presentations are vital components of the Congresses. The first Congress was held in 2008 in Stockholm, Sweden, and drew 260 attendees. The 2009 Congress took place in Pilsen, Czech Republic, and attracted 213 participants.

The third INCF Congress, Neuroinformatics 2010, was held August 30 to September 1 in Kobe, Japan. The program committee was chaired by Professor David Van Essen (University of Washington, St Louis, USA) and the local organizing committee was headed by the Congress Secretary General, Professor Shiro Usui (Riken BSI, Wako, Japan), Director of the Neuroinformatics Japan Center and delegate of the INCF Japan Node. As the previous INCF Congresses, this meeting was organized as a 3-day single track event featuring keynote lectures, workshops with speakers and panel discussions, poster sessions, as well as live computer demonstrations and selected oral "spotlight" presentations. In the last half day of the Congress, the local organizers held a Japan-Node special session on "Hierarchical data-oriented neuroscience" to facilitate neuroinformatics in Japan and Asia (<http://www.neuroinformatics2010.org/about>).

This year's Congress attracted 227 participants from 19 countries and a total of 115 abstracts were presented (92 poster and 23 demo-presentations). Roughly half of the participants were from Japan. United States, Germany, Sweden, Switzerland and United Kingdom were also well represented. Another very positive features of this year's Congress was the increased Asian representation, including the first ever participants from Taiwan and South Korea.

Program of Neuroinformatics 2010

Keynotes Lectures:

- Upinder Bhalla (NCBS) "Multiscale models of the synapse: a self-modifying memory machine"
- Ryohei Kanzaki (Univ. Tokyo) "Brain mechanisms for the generation of adaptive behavior"
- Maryann Martone (UC San Diego) "The possibility and probability of a global neuroscience information framework"
- Colin Ingram (University of Newcastle) "Working in the clouds: creating an e-science collaborative environment for neurophysiology"
- Lee Hood (Institute for Systems Biology) "A systems approach to neurodegenerative disease, emerging technologies and proactive medicine"

Workshops:

Workshop 1: How to describe a model: description language solutions and challenges (Chair: Erik De Schutter)

- Sean Hill "Challenges for Multi-scale Modeling Languages"



- Chung-Chuan Lo "A layered description language for spiking neural network modeling"
- Nicolas LeNovère "Describing the whole life-cycle of modeling in neuroscience"

Workshop 2: Synaptoprojectomes: Assembling, using and sharing dense cellular micromaps of Brains (Chair: Mark Ellisman)

- Robert E. Marc "Mining retinal connectomes"
- Marcel Oberlaender "Quantitative anatomy for assembling large scale neural networks"
- Davi Bock "Toward relating wiring diagrams to receptive fields: electron microscopy of calcium-imaged neurons in mouse visual cortex"

Workshop 3: Neuroinformatics of BMI: decoding and control of neural codes (Chair: Kenji Doya)

- Yukiyasu Kamitani "Decoding visual perception from human brain activity"
- Hagai Lalazar "Sensorimotor control and learning using a Brain-Machine Interface"
- Edward Boyden "Enabling Systematic Neuroscience with Novel Optical Neural Control Strategies"

Workshop 4: Molecular mechanisms of neural signaling (Chair: Svein Dahl)

- Phillip Biggin "Classification, structure and function of neural membrane proteins"
- Slawomir Filipek "Ligand binding and action of microswitches in G protein coupled receptors"
- Rama Ranganathan "Systems-level analysis of a G protein mediated signaling pathway"

Japan-Node Special Symposium: How Neuroinformatics can revolutionize Neuroscience

INCF Global Initiatives (Chairs: S Grillner & J Bjaalie)

- Sten Grillner "What INCF can do for Neuroscience"
- Erik De Schutter "New model description standards to facilitate multi-scale modeling"
- Robert W. Williams "Global exploratory analysis of massive neuroimaging collections using Microsoft live labs pivot Silverlight"
- Maryann Martone "The INCF Program on Ontologies for Neural Structures"
- Colin Ingram "Practical metadata standards: Making data sharing and endurance feasible"

New Projects and Impacts from Asian-Pacific circle (Chair: S Usui)

- David van Essen "An informatics perspective on cerebral cortical connectivity and function"
- Gary Egan "Neuroinformatics approaches for mapping striatal structures and cortico-striatal Connections in the human brain"
- Soo-Young Lee "Perspectives on neuroinformatics as an important tool for an engineering goal - Artificial cognitive system"
- Taishin Nomura "Integrated bioscience with Dynamic Brain platform"

- Ryutarou Himeno "Japan's next-generation supercomputer R&D project and grand challenges in life science"

Panel Discussion (Chair: S Grillner)

David Van Essen, Jan G. Bjaalie, Upinder Bhalla, Chung-Chuan Lo, Gary Egan, Soo-Young Lee, Kenji Doya, and Shiro Usui

You can download the abstract book PDF at (http://www.neuroinformatics2010.org/images/Neuroinformatics2010_AbstractBook_web%20-2.pdf) and you can also browse the abstracts online at the Frontiers in Neuroscience web site (http://www.frontiersin.org/Community/EventDetails.aspx?eid=615&va=1&d=0&sname=Neuroinformatics_2010&name=AbstractDetails.aspx) or search through them using the Related Abstract Search Tool (<http://ras.ni.brain.riken.jp/neuroinformatics2010/>) provided by the Neuroinformatics Team at RIKEN BSI.



At the welcome reception, we invited the Noh performance "Shohjoh" played by T. Tanaka (<http://neuroinformatics2010.org/program/noh>) where participants enjoyed one of the most traditional Japanese Performances, as depicted in the photo. On the front page of the Neuroinformatics 2010 web site (www.neuroinformatics2010.org) you can view around a hundred photos from the congress including Keynote speech, Poster and Demo session and bay cruise Banquet dinner as how people enjoyed the Congress (also here <http://www.flickr.com/photos/43391733@N02/sets/72157624928479805>).

NEURO2010

In conjunction with Neuroinformatics2010, INCF collaborated with Neuro2010, the joint conference of 3 major society annual meetings: Japan Neuroscience Society, Japanese Society for Neurochemistry and Japanese Neural Network Society, which was held on September 2-4 at the same venue. Among the 227 Neuroinformatics 2010 participants, 79 were registered for both meetings for a discounted fee. The first day of Neuro2010 featured the INCF Co-hosting Symposium on "Hierarchical data-oriented neuroscience". Data-oriented neuroscience is a novel research field which attempt to integrate high-throughput measurement data at different levels of neural systems, from molecules to behaviors, to create databases, to discover new knowledge and to construct quantitative models. In this symposium, we discussed possible future directions of data-oriented neuroscience with invited talks by leading researchers engaged in developments of large-scale neural databases and multi-scale models. This session attracted more than 150 participants and thus provided an excellent opportunity for the organizers to introduce what neuroinformatics can do for neuroscience, especially for Japanese and Asian neuroscientists.

The Congress was our dream, especially the chance to introduce INCF activities for the Japanese community and thus we thank all the people attending and supporting this Congress, especially INCF and all the INCF National-Node members, and last but not least, all the staff working with the preparations and realization of the Congress, and in final, special thanks to Japanese foundations for supporting the Congress.

INCF is looking forward to the 4th Congress of Neuroinformatics to be held in Boston, USA on September 4-6, 2011. The 2011 Program Committee Chair is Mitsuo Kawato and the Local Organizing Committee is headed by David Kennedy. More information is available at <http://www.neuroinformatics2011.org/>. ■

MEETING REPORT: SEVENTH INTERNATIONAL MEETING ON COMPUTATIONAL INTELLIGENCE METHODS FOR BIOINFORMATICS AND BIostatISTICS (CIBB 2010)

September 16-18 2010, Palermo, Italy (<http://cibb10.pa.icar.cnr.it/>)

Riccardo Rizzo



On September 18 closed the seventh CIBB, meeting on Computational Intelligence methods for bioinformatics and biostatistics. The meeting was organized in the magnificent sala Martorana in Palazzo Comitini, Palermo, and was a joint operation of the Special Interest Groups on Bioinformatics and Biopattern of INNS and of the Task Force on Neural Networks of the IEEE CIS Technical Committee on Bioinformatics and Bioengineering with the collaboration of some national institutions.

This year CIBB 2010 gathered 31 researchers discussing the development of computational intelligence models and of their biomedical and bioinformatics applications. In regular session, 16 papers were presented and 8 papers in special sessions. The plenary talks focused on clustering problems (R. Giancarlo, University of Palermo, Italy), the relationships of bioinformatics and biostatistics (P.Lisboa, John Moores University, UK) and the prediction of subcellular protein location (G. Pollastri, University College of Dublin, Ireland).

In regular sessions many papers focused on gene expression data analysis, and sequence analysis. Special sessions on Data Clustering and Decision Support Systems collected very interesting papers. A panel including Leif Peterson, Paulo Lisboa, Roberto Tagliaferri, and Francesco Masulli discussed the present collaboration in bioinformatics and biostatistics between INNS and IEEE-CIS and the next joint initiatives. ■



MEETING REPORT: INNS WORKSHOP AND THE FORMATION OF INNS SIG-INDIA

November 12, 2010, Nagpur, India

Suash Deb

International Workshop on Future Directions of Artificial Neural Networks (FDANN'10) was the first ever INNS sponsored event in India which took place in the Orange City of India, Nagpur (Institute of Management Technology (IMT)) on 12th November, 2010. Altogether 48 participants registered for the event.

FDANN was inaugurated formally by Dr. Rajendra Nargundkar, Director, IMT Nagpur. He welcomed the participants & appreciated the ANN initiatives in India.

The President of INNS, Dr. Nik Kasabov addressed the audience through video conferencing & amongst others, announced the formation of INNS-India Regional Chapter. Dr. Kasabov also announced the decision of the INNS Governing Body to name Prof. Suash Deb, C.V. Raman College of Engineering, Bhubaneswar as the Founding Chair of INNS-India. It was greeted with huge applause from the audience.

He also delivered a very lively technical presentation entitled : New Directions in NN Models & Applications : Spiking Neural Networks

Apart from Dr. Kasabov, Dr. Lipo Wang (NTU, Singapore) a renowned researcher in the field of ANN delivered the keynote address entitled Optimal Scheduling in Communications Networks Using Computational Intelligence. He was also the nominee of the Governing Body of INNS to oversee the proceedings of the workshop. Wearing the INNS hat, Dr. Wang appreciated the leadership of Prof. Suash Deb & pledged all possible support for the newly formed Indian Wing of INNS. Dr. Jonathan Chan, the immediate past president of Asia Pacific Neural Networks Assembly (APPNA) appraised the audience on different associations concerning the ANN. Dr. Alok Deb (IIT, Kharagpur) was the other invited speaker on the occasion.

Prof. Rajiv Mall of Indian Institute of Technology, Kharagpur was the Guest-of Honor for the workshop. He formally introduced Prof. Deb before the audience & requested the latter to deliver the acceptance speech & outline his vision for INNS-India. In his acceptance speech,

Prof. Deb, while thanking the INNS President & the entire INNS Governing Body for reposing its faith, solicited the active participation of all – students/faculties/scientists/engineers to convert INNS-India into a large banyan tree which can give shelter to a no. of people under its shadow. The audience gave a huge thumbs up response to this endeavor & feeling encouraged, he concluded by emulating President Obama's famous pre election speech – Yes, we can!

The vote-of-thanks were also delivered by the newly elected chair of INNS-India.

The mandate of INNS-India is to popularize the ANN in India & create a platform where the Indian researchers can converge annually to discuss various issues related to ANN.

The task is challenging but all the stakeholders are solicited to join hands to further the activities of INNS-India & in the process, popularize ANN in India. It should be promoted vigorously & if anybody is willing to join this endeavor, email to suashdeb@gmail.com. ■



Drs. Suash Deb (Left) and Jonathan Chan (Right)



Standing 1st row : (from Left) Dr. Alok Deb, Prof. Rajiv Mall, and Prof. Suash Deb. Also seen in that row is Dr. Lipo Wang and Prof. R. K. Jena (second & first from right respectively) & Dr. Jonathan Chan (extreme right - second row).

MEETING REPORT: INNS SIG ON ENGINEERING APPLICATIONS OF NEURAL NETWORKS (EANN)

November 25, 2010, London, U.K.

Chrisina Jayne and Dominic Palmer-Brown

The first meeting of the newly formed Engineering Applications of Neural Networks Special Interest Group (SIG-EANN) took place in Thessaloniki, during the ICANN 2010 conference.

The meeting, organised by the EANN SIG Co-chairs, Dominic Palmer-Brown and Chrisina Draganova, considered the objectives of the group and how it will bring together researchers from across the world who share an interest in the application of neural networks to real world problems. The SIG will be linked to the on-going series of EANN conferences and the meeting discussed the organisation of EANN 2011 which will take place in Corfu next September. The plan is to run EANN every year from now on, and it is intended to organise EANN 2012 in Bulgaria. A proposal to introduce a new open source journal focussing on neural computing applications was also discussed and will be developed by the SIG.



The first INNS SIG-EANN meeting at ICANN2010 on Sept. 17, 2010.

The Faculty of Computing at London Metropolitan University hosted the first one day workshop of the International Neural Network Society (INNS) Special Interest Group (SIG) on Engineering Applications of Neural Networks (EANN) on 25th November 2010. The event was organised by the co-chairs of the INNS SIG, Prof. Dominic Palmer-Brown and Dr. Chrisina Jayne. It was sponsored by the INNS and the NTF grant of Dr. C Jayne. The workshop attracted 35 researchers from Spain, Italy, Greece, Finland and the UK (Birkbeck College, Portsmouth University, Westminster University, Queen Mary, Nottingham Trent University, University of East London and London Metropolitan University). The event included five invited talks, seven PhD poster presentations and discussion on open problems in EANN. The main areas covered included modal learning in neural networks, transmembrane protein prediction and analysis, modelling the human genome, fuzzy logic risk modelling and soft computing engineering approach to audio and speech processing. The workshop also included discussions on how to use neural computing to identify musical preferences; and for modelling driver behaviours in a simulation of traffic flow. The next EANN conference will take place in Corfu, Greece between 15th and 18th September 2011. Details about submission of papers, proposals for tutorials and workshops can be found on <http://delab.csd.auth.gr/eann2011/index.html>.



INNS SIG-EANN meeting at London Metropolitan University on Nov. 25, 2010

NEW JOURNAL ANNOUNCEMENT: EVOLVING SYSTEMS: AN INTERNATIONAL JOURNAL OF ADVANCED SCIENCE AND TECHNOLOGY

Plamen Angelov

The new journal on Evolving Systems: An International Journal of Advanced Science and Technology, ISSN 1868-6478

(<http://www.springer.com/engineering/journal/12530>) published by Springer has now been

launched. It will provide fast processing times (on-line submission at

<https://www.editorialmanager.com/evos/>),

focused, yet encompassing hot emerging topic area, professional and dedicated editorial staff and more.

It will solicit high quality publications that will undergo double blinded thorough review process (minimum three reviews required to proceed) and yet will give chance to young authors by dedicated special issues.

"Evolving Systems" covers surveys, methodological, and application-oriented papers in the emerging area of evolving systems. Evolving systems are inspired by the idea of system model evolution in a dynamically changing and evolving environment. They use inheritance and gradual change with the aim of life-long learning and adaptation, self-organization including system structure evolution in order to adapt to the (unknown and unpredictable) environment as structures for information representation with the ability to fully adapt their structure and adjust their parameters.

"Evolving Systems" solicits publications that address the problems of modelling, control, prediction, classification and data processing in non-stationary, unpredictable environments and describe new methods and approaches for design of systems able to fully adapt its structure rather than adjust its parameters based on a pre-trained and fixed structure.

The journal is devoted to the topic of self-developing, self-organised, and evolving systems in its entirety - from systematic methods to case studies and real industrial applications. It covers all aspects of the methodology such as

conventional systems,
neuro-fuzzy systems,
evolutionary systems,
Bayesian systems,
machine learning methods,
clustering, and
classification,

but also looking at new paradigms and applications, including medicine, robotics, business, industrial automation, control systems, transportation, communications, environmental monitoring, biomedical systems, security, and electronic services. The common features for all submitted methods and systems are evolvability and knowledge discovery.

The journal is encompassing contributions related to:

- 1) Methods of computational intelligence and mathematical modelling
- 2) Inspiration from Nature and Biology, including Neuroscience, Bioinformatics and Molecular biology, Quantum physics
- 3) Applications in engineering, business, social sciences.

Abstracted/Indexed in Google Scholar and ISI Web of Knowledge.

Looking forward to your contributions. ■



Francesco Carlo Morabito



Premise

Artists usually feel that scientific analysis has nothing to do with creativity. The possibility of reducing to a mere measure the artists' abilities is strongly rejected as a sort of contamination: aesthetic information is a knowledge that sender and receiver share [9] and cannot be translated to other "channels". Most scientists, on the other hand, look at the arts as a worldwide development that cannot aspire to objectivity. Recently, some worldwide recognized scientists, among which the Nobel Laureates M. Gell-Mann and J.P. Crutchfield, made some efforts to search for interesting points of contact between art and science, essentially within the framework of the science of complexity [1]. Along this vein, in this contribution, I will try to point out some novel insights on this truly fascinating subject.

Complexity and Information in Art.

A painting is a static object that possibly encapsulates a relevant amount of information: it represents the final step of a multi-step creative process. Apparently, it is possible to look at the art object each time through a simple museum tour, thus repeating at will the observing experience. However, most paintings from famous artists are known to be able to convey to us novel emotions at each visit. In this sense, we can interpret the perceptive process as a brain-painting interaction through an artistic message. R. Arnheim, in 1964 [2], introduced the concept of pictorial balance as the appropriate distribution of optical weights in a picture: different objects, colours and shapes weight differently from an optical perception perspective. In the global view of the painting, the various atomic pictorial elements are grouped into a unified perception act that is also related to the previous experience/education of the observer. The principle of compositional balance is of holistic nature and emerges from the joint effects of the different components of a stimulus field: it cannot be achieved by a mere sum of isolated elements.

G. D. Birkhoff, in 1928, introduced the concept of Aesthetic Measure (AM), defined as the ratio between order and complexity [3]. M. Bense, in 1965, reinterpreted AM from an information theory viewpoint [4]. In his work, the creative process is seen as a transformation from an initial uncertainty, expressed by the Shannon entropy of the repertoire (palette), to the algorithmic information content of the final image, measured by the Kolmogorov complexity.

In this contribution, we would like to introduce a novel quantitative measurement of complexity borrowed from neuroscience which, in our opinion, may help to justify the claims of some artists regarding the deliberate choice of an artistic rendering of the creative process underlying the genesis of painting. Modern Art is the paradigm we propose for this investigation; in particular, we will analyse some oeuvres of the Russian painter Vassily Kandinsky (1866-1944).

Abstract Art and Complexity.

Kandinsky was the founder of abstract painting: we focus here just on a single aspect of his work, which seems to be directly related to the concept of complexity [5]. Kandinsky was fascinated by the emotional power of music, that he considered the best form of communication. Indeed, music allows the listener some freedom of imagination and interpretation not based on the descriptive, but rather on abstract qualities. He searched to reproduce in paintings a sort of dynamic structure reminiscent of music. The terms "Composition" and "Improvisation" he used for some abstract oeuvres imply a metaphor with music. In particular, Composition VI and Composition VII best demonstrate the influence of Schoenberg's music. The paintings are characterized by an explosion of various shapes and colours which appears to emanate from some "sources", that are centres of the compositions, discerned sequentially by the viewer in a sort of subliminal guided dynamic process. One of the main interesting properties of this very large-sized paintings, in our perspective, is the explicitly desired equal distribution of interest and significance throughout the piece and lack of emphasis on any particular area. Kandinsky so rejected the hierarchical figurative system by embracing the polyphonic voices of Schoenberg's atonal music. From our viewpoint, this is reflected in the probability distribution of the palette of colours.

Scientific objectivity and quantitative measurements prove to be an essential instruments for determining the content of abstract paintings. For example, it is well known, in the related literature, the possibility of carrying out a fractal analysis of Pollock's drip paintings [6]. In that case, while the significance of the patterns created by the artist is controversial, some researchers were able to describe quantitatively the fractal nature of the paintings.

The quantitative measure of complexity we propose to use in this investigation is directly derived from brain science and to the seminal work of G. Edelman [7]. In short, we will make use of a version of the Neural Complexity (CN) concept early proposed for measuring the interplay between two fundamental aspects of brain organization, namely, segregation of local areas and their global integration during perception. CN and our proposed version of it, use a zeroth-order measure, namely the Shannon entropy of the histogram. Accordingly, the researches presented in this paper could then develop towards two main directions: 1) the use of higher-order measures, in principle able to handle edges and contrast, well known in the studies of visual perception; 2) the incorporation of the novel concept of Tsallis Entropy in the formula of mutual information, that allows us to handle long-range interactions. Both these developments are strongly founded in brain studies.

Statistical Measure of Complexity.

A painting can be interpreted as a representation of thinking and/or emotions. In figurative arts, the object of representation is "simple" and corresponds to our ordinary vision of the surrounding world. In abstract art, it is somehow difficult to capture the underlying message of the artist. In some oeuvres of abstract painters there is, however, a deliberate willingness of expressing concepts and ideas that may favour introspective analysis, and, eventually, the emergence of meaning in the observer. The ability of integrating the information transmitted by the painting and to discover the meaning is basically a cognitive act. While the above described processes are dynamic, a painting is a static object, that can be represented as an image. In this work, we shall thus consider the image corresponding to the painting like a luminance two-dimensional signal (a matrix of pixels). In Kandinsky, the choice of colours is certainly part of the creative process, thus, it would be appropriate to consider a colour processing, with reference to the three-colour RGB chrominance signals. This aspect of the work is not treated here: we limit ourselves to the processing of the Y_{709} luminance signal. The *repertoire*, i.e. the palette of colours, is assumed to be given by the normalized histogram of the luminance values of the image. The creative process is a selection of a specialized final product (the painting) among every possible realizations, given the distribution of probability of the repertoire. The *Shannon Entropy*, $H(X)$, of the image is thus defined by:

$$H(X) = - \sum_{i=1}^{256} P_i * \log_2(P_i)$$

where p_i is the i -th value of the image histogram, and X is the image representation of the painting under analysis. The uncertainty about the state of a subset X_j of the image X , which is accounted for by the state of the rest of the system ($X-X_j$), is called *mutual information*, given by:

$$MI(X_j; X - X_j) = H(X_j) + H(X - X_j) - H(X)$$

where $X=X_j \cup X-X_j$; MI is positive and symmetric: it zeroes in the case of statistical independence. MI can be interpreted as a measure of statistical dependence expressing how much information is provided about the state of a subset (X_j) by knowing the state of the rest of the system ($X-X_j$). It is high if both X_j and $X-X_j$ have high entropy (high variance) and share a large fraction of it.

We consider here the image representing the painting consisting of a number of elementary components (subsets of different size) which interact with each other spatially. At this level of the study, there are no consideration of dynamical effects, but we are planning some fMRI experiments in order to analyse how the "static" complexity of the art drawing can influence its dynamic perception. According to recent studies carried out by art experts, some painters, in portions of their professional life, developed oeuvres that can be considered "complex". May these claims be supported by objective data? In the present study, we try to characterise the complexity of the paintings by the statistical foundations of information theory. A painting is thus complex if it is both highly informative (in the Shannon sense) and highly integrated (coherent). According to [8], we propose to estimate the average integration for subsets of the image of increasing size, that is, at multiple spatial scales. If a painting is composed of multiple "segregated" elements, the average integration for small subsets is low. This implies that such elements have

independent meaning in the context and provide separated sources of information. If the painting, as a whole, shows an organized emerging effect, the average integration for large subsets is high. This expresses the inherent ability of the artist to integrate different sources of information into a coherent whole. It becomes thus possible to quantitatively measure the coexistence of the two aspects by defining a suitable measure of "Artistic Complexity" (C_A) of each painting. This procedure allows us to consider novel aspects of the painting, deliberately introduced at different resolution level by the artist, this way giving a formal interpretation of the artistic piece from an unusual perspective.

The C_A can be computed in terms of average mutual information, by using an ensemble average of mutual integration values between subsets of a given size and their complement, i.e., all of the possible bipartitions of the image, summed over all subset sizes. The mathematical expression of the C_A is given by the same formula of Neural Complexity (C_N) [7, 8]:

$$C_N(X) = \sum_{k=1}^{N/2} \langle MI(X_f^k; X - X_f^k) \rangle$$

Results on Kandinsky's Compositions.

Finally, we could give a feeling of the results achieved by our study. A complete report of the paintings we analysed, that refers to authors from figurative arts, like Caravaggio and Mattia Preti, to expressionists like Monet, till the recent Pollock's oeuvres, will be published soon on a different journal. Here, we would like to draw just some conclusions from the analysis of the *Composition VI* and *Composition VII*, since the two paintings are considered by art experts like the Kandinsky's oeuvres of maximum complexity. This qualitative interpretation is confirmed by our studies. The maximum values of C_A for over 100 paintings from different artists are achieved exactly for the two above mentioned ones. Figure 1 depicts some results concerning *Composition VI*. As previously mentioned, we have also introduced a novel definition of C_A based on the concept of Tsallis Entropy: in our view, this non-extensive definition of entropic content can be particularly useful in our problem, due to its ability to catch long-range interactions between sub-parts. Figure 2 reports some results for the "Bacchus" of Caravaggio.

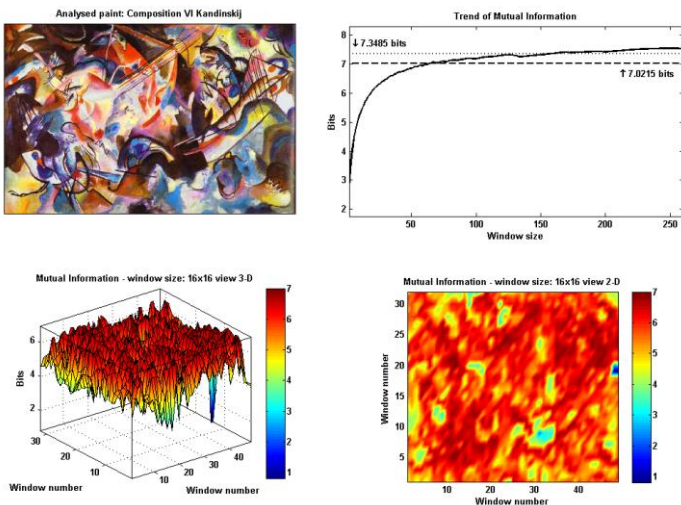


Figure 1: An image of the "Composition VI" by Kandinsky (1913; oil on canvas, 195 x 300 cm, Hermitage Museum, St. Petersburg); the curve representing the trend of average MI for different window sizes (the C_A is measured by the area under the curve normalized to the painting size for comparison with other paintings); a 3-D and 2-D representations of the MI computed on different bipartitions of the painting for a window size of 16x16. The 2-D representation allows us an interpretation of the artist's creative process: some spots of low MI are clearly visible that interestingly correspond to the "sources" of the dynamically evolving process. Indeed, the painting represents the impending crash of a tidal wave of colliding forms and colours: the theme of this work is "The Deluge". Kandinsky defined three centres to this Composition, which are discerned sequentially by the viewer. The quantitative representation we are giving here, in terms of MI, repeated at different resolution levels, may reproduce the above drawn creative path.

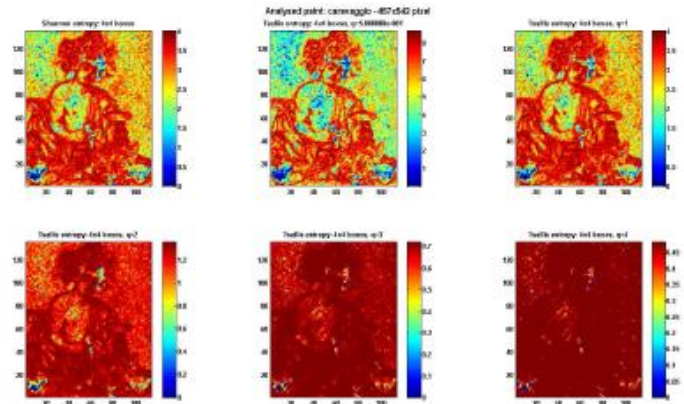


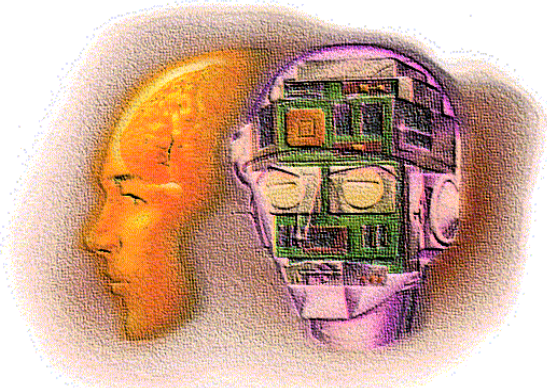
Figure 2: For the Caravaggio's Bacchus (Michelangelo Merisi, c. 1595, oil on canvas, 95cm x 85cm, Galleria degli Uffizi, Florence, Italy), the 2-D representations of MI for bipartitions of 4x4 window size basically reconstruct the main segregated aspects of the painting. The different sub-figures refer to different parameters of the Tsallis Entropy ($q=1$ corresponds to Shannon Entropy and $q=2$ to Renyi's Entropy).

Acknowledgments

We would like to thank my Ph.D. Student, Gianluigi Occhiuto, and my Post-Doc Associated Researcher, Matteo Cacciola for having carried out most of the simulations involved in the present study.

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UPCOMING MEETING: DISTRIBUTED MACHINE LEARNING AND SPARSE REPRESENTATION WITH MASSIVE DATA SETS (DMMD 2011)

Jan 18 - 20, 2011, Sydney, Australia

<http://research.ict.csiro.au/conferences/machine-learning/>

Oliver Obst

The symposium will take place at the CSIRO Campus in Sydney (Marsfield), Australia.

The exponentially increasing demand for computing power as well as physical and economic limitations has contributed to a proliferation of distributed and parallel computer architectures. To make better use of current and future high-performance computing, and to fully benefit from these massive amounts of data, we must discover, understand and exploit the available parallelism in machine learning. Simultaneously, we have to model data in an adequate manner while keeping the models as simple as possible, by making use of a sparse representation of the data or sparse modelling of the respective underlying problem.



The invited speakers are:

Samy Bengio (Google Research, CA, USA)
Barbara Hammer (University of Bielefeld, Germany)
Yann LeCun (New York University, NY, USA)
Michael Mahoney (Stanford University, CA, USA)

Through a combination of invited talks, contributed presentations, discussions and posters, we hope to gain a better understanding of available algorithms and best practices, as well as their inherent limitations.

We are looking for submissions of short papers / extended abstracts (at most 4 pages in NIPS format), in one or more of the following areas:

- Distributed, Multicore and Cluster based Learning Techniques
- Machine Learning on Alternative Hardware (GPUs, Robots, Sensor Networks, Mobile Phones, Cell Processors ...)
- Sparsity in Machine Learning and Statistics
- Learning results and techniques on Massive Datasets
- Dimensionality Reduction, Sparse Matrix, Large Scale Kernel Methods
- Fast Online Algorithms for Large Scale Data
- Parallel Computing Tools and Libraries

Accepted submissions will be presented either as contributed talks or during the poster discussion period. Through a combination of invited talks, contributed presentations, discussions and posters, we hope to gain a better understanding of available algorithms and best practices, as well as their inherent limitations.

Selected submissions will be considered for a special issue of a journal or a collected volume on the topic of the symposium. A separate call for papers will then be issued after the event for the special issue/collected volume. Please refer to the web page for further details.

Attendance to DMMD 2011 is free, but limited to approx. 50 participants (first in, best dressed - please register by email).

We cannot provide travel support, but for a limited (small) number of interstate/overseas students, we will organise free accommodation. Priority will be given to students with an accepted paper. If you would like to be considered for this, please send an email to apply (deadline 1 November 2010).

Important Dates

- Submission deadline: 1 November, 2010
- Registration deadline: 31 December, 2010

Chair: Oliver Obst (CSIRO ICT Centre, Sydney)

Program Committee Members

Samy Bengio	Joschka Boedecker
Stephan Chalup	Tim Cornwell
Ying Guo	Barbara Hammer
Yann LeCun	Simon Lucey
Michael Mahoney	N. Michael Mayer
Mikhail Prokopenko	Scott Sanner
John A. Taylor	Rosalind Wang ■



UPCOMING MEETING: 2011 INNS EDUCATIONAL SYMPOSIUM ON NEURAL NETWORKS (IESNN2011)

January 25-27, 2011, Lima, Peru

<http://inns-iesnn.org>

Linda Potchoiba and Danil Prokhorov

The 2011 International Neural Network Society (INNS) Educational Symposium on Neural Networks is intended to benefit local researchers and students in South America. The symposium will cover miscellaneous topics in neural networks and other computational intelligence approaches and their applications. It will be a great opportunity to meet and interact with colleagues from this region and beyond. The symposium is planned to be a single track with keynote presentations by prominent neural network researchers, regular presentations and demonstrations.



The Organizing and Program Committee welcome participation of the INNS members and all people who are interested in neural networks and related technologies. If you are interested in presenting at the symposium and sharing your experience in the relevant areas, please contact the General Chair (ecuadros@gmail.com). Please also visit the symposium web site for more information and news.

The symposium areas include but are not limited to:

Neural Networks Models & Algorithms
Connectionist Cognitive Science and Cognitive Modeling & Applications
Neural Network Approaches to Optimization
System Modeling and Control
Power System Applications
Automotive Applications
Aerospace Applications
Robotic Applications
Other Industrial Applications

Organizing Committee:

General Chair: Ernesto Cuadros-Vargas, Peru
Program Co-Chairs: James R. Dankert and Fernando Jimenez
Symposium Advisor: Danil Prokhorov ■





UPCOMING MEETING: IEEE SYMPOSIUM SERIES ON COMPUTATIONAL INTELLIGENCE (SSCI 2011)

April 11-15, 2011, Paris, France
<http://www.ieee-ssci.org>

Martine De Cock

This international event promotes all aspects of the theory and applications of Computational Intelligence. With its hosting of over thirty technical meetings in one location, it is bound to attract lead researchers, professionals and students from around the world. Sponsored by the IEEE Computational Intelligence Society, the 2011 edition follows in the footsteps of the SSCI 2007 meetings held in Honolulu and of the SSCI 2009 series held in Nashville. The event will take place in the magic town of Paris.

List of Symposia and Workshops

- * ADPRL 2011 Symposium on Adaptive Dynamic Programming and Reinforcement Learning
- * CCMB 2011 Symposium on Computational Intelligence, Cognitive Algorithms, Mind, and Brain.
- * CIASG 2011 Symposium on Computational Intelligence Applications in Smart Grid
- * CIBCB 2011 Symposium on Computational Intelligence in Bioinformatics and Computational Biology
- * CIBIM 2011 Workshop on Computational Intelligence in Biometrics and Identity Management
- * CICA 2011 Symposium on Computational Intelligence in Control and Automation
- * CICS 2011 Symposium on Computational Intelligence in Cyber Security
- * CIDM 2011 Symposium on Computational Intelligence and Data Mining
- * CIDUE 2011 Symposium on Computational Intelligence in Dynamic and Uncertain Environments
- * CIFEr 2011 Symposium on Computational Intelligence for Financial Engineering & Economics
- * CII 2011 Symposium on Computational Intelligence in Industry
- * CIMI 2011 Workshop on Computational Intelligence in Medical Imaging
- * CIMR 2011 Workshop on Computational Intelligence for Mobile Robots: Air-, Land-, and Sea-Based
- * CIMSIVP 2011 Symposium on Computational Intelligence for Multimedia, Signal and Vision Processing
- * CIPLS 2011 Workshop on Computational Intelligence in Production and Logistics Systems
- * CISched 2011 Symposium on Computational Intelligence in Scheduling
- * CISDA 2011 Symposium on Computational Intelligence for Security and Defence Applications
- * CIVI 2011 Workshop on Computational Intelligence for Visual Intelligence

- * CIVTS 2011 Symposium on Computational Intelligence in Vehicles and Transportation Systems
- * CompSens 2011 Workshop on Merging Fields of Computational Intelligence and Sensor Technology
- * EAIS 2011 Workshop on Evolving and Adaptive Intelligent Systems
- * FOCI 2011 Symposium on Foundations of Computational Intelligence
- * GEFS2011 International Workshop on Genetic and Evolutionary Fuzzy Systems
- * HIMA 2011 Workshop on Hybrid Intelligent Models and Applications
- * IA 2011 Symposium on Intelligent Agents
- * IEEE ALIFE 2011 Symposium on Artificial Life
- * IEEE MCDM 2011 Symposium on Computational Intelligence in Multicriteria Decision-Making
- * MC 2011 Symposium on Memetic Computing
- * OC 2011 Workshop on Organic Computing RiiSS 2011 Workshop on Robotic Intelligence in Informationally Structured Space
- * RiiSS 2011 Workshop on Robotic Intelligence in Informationally Structured Space
- * SDE 2011 Symposium on Differential Evolution
- * SIS 2011 Symposium on Swarm Intelligence
- * T2FUZZ011 Symposium on Advances in Type-2 Fuzzy Logic Systems
- * WACI 2011 Workshop on Affective Computational Intelligence

IEEE Symposium on Computational Intelligence Applications in Smart Grid (CIASG 2011)

Symposium Chair: Ganesh Venayagamoorthy

Computational Intelligence (CI) evolves computational models and tools of intelligence capable of handling large raw numerical sensory data directly, processing them by exploiting the representational parallelism and pipelining the problem, generating reliable and just-in-time responses, and having high fault tolerance. Smart grid is basically the embedding of intelligence to enable bidirectional power flows with traditional sources of power generation, renewable sources and energy storage. CI deployment is essential in smart grid to make it a success. Research and deployment of smart grid technologies are being promoted by governments of many countries as a way of addressing energy independence, emission reductions, and bringing resilience to electricity infrastructures. The Symposium on CI Applications in Smart Grid (CIASG) aims at bringing researchers and engineers from academia and industry together to present, interact and review the latest progresses in this emerging field, and to explore future research directions to address its challenges.

CIASG invites authors to submit their original and unpublished work in the applications of CI to Smart Grid, including the following, but not limited to:

- * Algorithms for modeling, control and optimization
- * Communication and control
- * Cyber security
- * Demand side management
- * Distributed energy resources
- * Dynamic equivalents
- * Emissions
- * FACTS
- * Markets and economics
- * Methods and algorithms for real-time analysis
- * Optimization
- * Planning, operation and control
- * Plug-in vehicles
- * Renewable energy
- * Smart micro-grids
- * Smart grid education
- * Smart sensing
- * Synchrophasors
- * Wide area monitoring, control and protection
- * Visualizations for control centers ■

IEEE Workshop on Evolving and Adaptive Intelligent Systems (EAIS 2011)

Symposium Co-Chairs: Plamen Angelov, Dimitar Filev, Nikola Kasabov

EAIS-2011 is a part of the very successful series of events (2006 (UK), 2008 (Germany), USA (2009), UK (2010), France (2011)) which outlined this emerging topic. For more details, please, visit the web site at <http://www.ieee-ssci.org/2011/eais-2011>.

The authors of the selected best papers will be invited to submit extended versions to the Evolving Systems journal, v.2 (2011). Please, see the current content of the journal at <http://www.springerlink.com/content/m777238v4k45/>.

The topics that are included:

- * New Adaptive and Evolving Learning Methods;
- * Stability, Robustness, Unlearning Effects
- * Structure Flexibility and Robustness in Evolving Systems
- * Evolving in Dynamic Environments
- * Drift and Shift in Data Streams
- * Self-monitoring Evolving Systems
- * Evolving Decision Systems
- * Evolving Perceptions
- * Self-organising Systems
- * Neural Networks with Evolving Structure
- * Non-stationary Time Series Prediction with Evolving Systems
- * Automatic Novelty Detection in Evolving Systems
- * On-Line Identification of Fuzzy Systems
- * Evolving Neuro-fuzzy Systems
- * Evolving Fuzzy Clustering Methods
- * Evolving Fuzzy Rule-based Classifiers
- * Evolving Regression-based Classifiers
- * Evolving Intelligent Systems for Time Series Prediction
- * Evolving Intelligent System State Monitoring and Prognostics Methods
- * Evolving Intelligent Controllers
- * Evolving Fuzzy Decision Support Systems
- * Evolving Consumer Behaviour Models
Real-world application
- * Robotics
- * Control Systems
- * Industrial Applications
- * Data Mining and Knowledge Discovery
- * Intelligent Transport
- * Bio-Informatics
- * Defense

IEEE Symposium on Computational Intelligence for Multimedia, Signal and Vision Processing (CIMSIVP 2011)

Symposium Co-Chairs: Khan M Iftekharuddin and Salim Bouzerdoum

Constructive understanding of computational principles of multimedia, signal and visual information processing, perception and cognition is one of the most fundamental challenges of contemporary science. Deeper insight into such computational intelligence helps to advance intelligent systems research to achieve robust performance. Implementing integrated principles in artificial systems may help us achieve better, faster and more efficient intelligent systems. The Symposium will address theory and applications of non-traditional computational intelligence approaches in multimedia, signal and vision processing.

This year's conference includes, but not limited to:

- *Bio-inspired Vision
- *Neuronal mechanisms of visual processing
- *Low level vision and its relationship to biological machinery
- *Artificial learning systems for image and information processing
- *Evidential reasoning for recognition
- *Active visual perception, attention and robot vision
- *Functional Magnetic Resonance Imaging (fMRI) studies of visual segmentation and perception
- *Application of computational intelligence techniques in areas of:
- *Automated target identification and acquisition systems in defense and industry
- *Biomedical imaging Applications
- *3D photography
- *Face recognition
- *Learning to segment camouflaged objects
- *Motor actions and robotics
- *Image databases and indexing
- *Multimedia Signal Processing ■



UPCOMING MEETING: 8th International Symposium on Neural Networks (ISNN 2011)

May 29 – June 1, 2011, Guilin, China
<http://isnn2011.mae.cuhk.edu.hk/>

Derong Liu

The 8th International Symposium on Neural Networks (ISNN 2011) will be held in Guilin, China, as a sequel of ISNN 2004–2010. Guilin has a long history as the most beautiful place in China. It is famous for its wonderful scenery, rivers and karst peaks covered in lush greenery. ISNN 2011 aims to provide a high-level international forum for scientists, engineers, and educators to present the state of the art of neural network research and applications in diverse fields. The symposium will feature plenary lectures given by world renowned scholars, regular sessions with broad coverage, and some special sessions focusing on popular topics. All papers accepted by and presented at ISNN2011 will be published by Springer as multiple volumes of Lecture Notes in Computer Science which will be indexed by EI and ISTP. Selected papers will be published in special issues of several SCI journals.

List of Topics

1. Computational Neuroscience and Cognitive Science
 - Spiking neurons
 - Visual and auditory cortex
 - Neural encoding and decoding
 - Plasticity and adaptation
 - Brain imaging
 - Learning and memory
 - Inference and reasoning
 - Perception, emotion and development
 - Attractor and associative memory
 - Neurodynamics and complex systems
2. Models, Methods and Inference
 - Stability and convergence analysis
 - Neural network models
 - Supervised learning
 - Unsupervised learning
 - Embeddings and manifold learning
 - Active learning
 - Statistical and informationtheoretic methods
 - Kernel methods and support vector machines
 - Mixture models
 - Graphical and causal models
 - Bayesian networks
 - Topic models
 - Gaussian processes
 - Model selection
 - Matrix/tensor analysis
 - Structured and relational data
 - Clustering
3. Vision and Auditory Modelling
 - Visual perception and modelling
 - Visual selective attention
 - Statistical and pattern recognition
 - Visual coding and representation
 - Object recognition
 - Motion and tracking
 - Natural scene analysis
 - Auditory perception and modelling
 - Source separation
 - Speech recognition and speech synthesis
 - Speaker identification
 - Audio and speech retrieval
 - Music modelling and analysis
4. Control, Robotics and Hardware
 - Neuromorphic hardware and implementation
 - Embedded neural networks
 - Fuzzy neural networks
 - Cognitive robotics

UPCOMING MEETING: NEUROMORPHIC COGNITION ENGINEERING WORKSHOP

June 26-July 16, 2011, Telluride, Colorado

Ralph Etienne-Cummings, Timmer Horiuchi, and Tobi Delbruck

Topic areas for this summer's Telluride Neuromorphic Engineering Workshop will be chosen from proposals submitted to the organizers.

Topic area leaders will receive housing for themselves and their invitees and limited travel funding. Topic leaders help to define the field of neuromorphic cognition. They shape their topic by selecting invited speakers and project leaders and by suggesting topic area projects. Topic area leaders will also be involved in the selection of workshop applicants.

Topic areas can span a large field; we are looking for leadership in planning activities and inviting good people in a field. Although past topic areas have tended to be very broad and discipline-oriented (e.g., cognition, audition, vision, robotics, neural interfacing, neuromorphic VLSI, etc.), new application-oriented topic areas (e.g., sensor fusion, game-playing robot, etc.) are also desirable. Topics that incorporate neuromorphic cognition are especially welcome.

Developmental robotics
Multi-agent systems and game theory
Reinforcement learning
Planning and decision making
Action and motor control
Visuomotor control

5. Novel Approaches and Applications

Brain-like systems
Adaptive intelligent systems
Brain-computer interfaces
Granular computing
Hybrid intelligent systems
Neuroinformatics and neuroengineering
Bioinformatics
Information retrieval
Data mining and knowledge discovery
Natural language processing

The following **special sessions** have been approved:

- 1) Machine Learning Ensemble Methods and Applications
Organizer: Wenjia Wang
- 2) Advances in Extreme Learning Machine
Organizers: Stefano Squartini, Rui Zhang, and Guang-Bin Huang
- 3) Computational Intelligence Algorithms for Advanced Human-Machine Interaction
Organizers: Jianhua Tao, Stefano Squartini, and Bjorn Schuller
- 4) Social Affective Data Mining and Analysis
Organizers: Amir Hussain, Tariq S. Durrani, Newton Howard, and Erik Cambria
- 5) Controller Design, Stability Analysis and Applications of Neural Networks
Organizer: Tie-Shan Li
- 6) Complex Networks and Multi-agent Systems
Organizers: Jinhu Lu, Xiaoqun Wu, and Jin Zhou ■



Teams of two organizers are required. One of the organizers should be an attendee of a previous Telluride Workshop for at least one week.

The maximum 2-page proposals should include:

1. Title of topic area.
2. Two topic leaders and their affiliation and contact information.
3. A paragraph explaining the focus and goals of the topic area.
4. A list of possible specific topic area projects.
5. A list of example invitees (up to six names and institutions). No commitments necessary.
6. Any other material that fits within the two-page limit

Send your proposal in pdf/text format to organizers11@neuromorphs.net with subject line containing "topic area proposal". Proposals must be received by Monday, 10 January 2011; proposals received after that deadline may still be considered if space is available.

Resources limit the workshop to roughly 4 topic areas, each with 5 invitees. If your proposal for the topic area is not accepted, we will work with you to see if there is a natural way to include your ideas (and you) into the accepted topic areas. We hope to have significant turn-over each year in the topic areas and leaders to ensure fresh new ideas and participants. ■

UPCOMING MEETING: Special Session SSS25 - Evolving and Adaptive Fuzzy Systems at IEEE-FUZZ2011

June 27-20, 2011, Taipei, Taiwan

Plamen Angelov, Dimitar Filev, and Nik Kasabov

The concept of evolving and adaptive fuzzy systems was established during the last decade as a synergy between fuzzy rule-based systems as structures for information representation and real time methods for autonomous machine learning. This emerging area targets non-stationary processes by developing novel on-line learning methods and computationally efficient algorithms for real-time applications. One of the important research challenges today is to develop methodologies, concepts, algorithms and techniques towards the design of systems with a higher level of intelligence and autonomy, so that the systems can evolve their structure and knowledge of the environment. That is, the system must be able to evolve, to self-develop, to self-organize, to self-evaluate and to self-improve. Wireless sensor networks, assisted ambient intelligence, embedded soft computing diagnostics and prognostics algorithms, intelligent agents, smart evolving sensors; autonomous robotic systems etc. are some of the natural implementation areas of evolving and adaptive intelligent systems. This special session aims to bring together old friends and colleagues, experienced industry-based and academic researchers with enthusiastic newcomers. It is supported and organised by the Adaptive and Evolving Fuzzy Systems Task Force, Fuzzy Systems Technical Committee, Computational Intelligence Society, IEEE. Selected authors will be invited to submit extended papers for a special issue of the Springer journal Evolving Systems.

The main topics of interest include, but are not limited to:

New Adaptive and Evolving Learning Methods

- Stability, Robustness, Unlearning Effects
- Structure Flexibility and Robustness in Evolving Systems
- Evolving in Dynamic Environments
- Drift and Shift in Data Streams
- Self-monitoring Evolving Systems
- Evolving Decision Systems and Perceptions
- Self-organising Systems
- Non-stationary Time Series Prediction with Evolving Systems
- Automatic Novelty Detection in Evolving Systems
- On-Line Identification of Fuzzy Systems
- Evolving Neuro-fuzzy Systems and Fuzzy Clustering Methods
- Evolving Rule-based Classifiers and Regression-based Classifiers
- Evolving Intelligent Systems for Time Series Prediction
- Evolving Intelligent System State Monitoring and Prognostics

Methods

- Evolving Intelligent Controllers
- Evolving Fuzzy Decision Support Systems
- Evolving Consumer Behavior Models

Real-world applications

- Robotics and Industrial Applications
- Data Mining, Knowledge Discovery, and Bio-Informatics
- Intelligent Transport
- Defense



UPCOMING MEETING: INTERNATIONAL JOINT CONFERENCE ON NEURAL NETWORKS (IJCNN2011 UPDATES)

July 31 - August 5, 2011, San Jose, USA
<http://www.ijcnn2011.org/>

Ali Minai

Welcome to the official Web site of IJCNN 2011!

The International Joint Conference on Neural Networks is the premier international conference in the area of neural networks. IJCNN 2011 is organized by the International Neural Network Society (INNS), and sponsored jointly by INNS and the IEEE Computational Intelligence Society - the two leading professional organizations for researchers working in neural networks.



IJCNN 2011 will be held at the Doubletree Hotel in San Jose, CA. It will feature invited plenary talks by world-renowned speakers in the areas of neural network theory and applications, computational neuroscience, robotics, and distributed intelligence. In addition to regular technical sessions with oral and poster presentations, the conference program will include special sessions, competitions, tutorials and workshops on topics of current interest.

The beautiful and historic city of San Jose, located in the heart of Silicon Valley, is a hub of the high technology world. The Doubletree Hotel provides convenient access to all the attractions of San Jose, and is 55 minutes by car to San Francisco, Monterey and several other desirable destinations for attendees and their families.

For the first time, IJCNN 2011 will also feature a Special Track on Neuroscience and Neurocognition, for which authors may submit abstracts as well as full papers.

We look forward to seeing you in San Jose.

Important Dates

Paper Submission: Feb. 1, 2011
Decision Notification (Papers): April 1, 2011
Final Submission (Papers): May 1, 2011

New open Competition:

The competition The German Traffic Sign Recognition Benchmark is now open. Please check further information and other competition schedules.

Special Sessions

Special Session Chair: Steven L Bressler

The IJCNN 2011 Program Committee solicits proposals for special sessions within the technical scope of the conference. Special sessions are organized by internationally recognized experts and should aim to bring together researchers on focused topics. Special sessions are an important component of IJCNN, and papers submitted for special sessions will be peer-reviewed with the same criteria used for contributed papers.

Researchers interested in organizing a special session are invited to submit a formal proposal to the Special Sessions Chair, Steven Bressler (bressler@fau.edu). Special session proposals should include the session title, a brief description of its scope, motivation, its appeal to the attendees of this conference, organizer names and contact information, and brief CVs of the organizers.

Workshops

Workshop Chair: Robi Polikar

As the Workshop Chair for IJCNN 2011, I would like to invite you to propose a post-conference workshop for IJCNN 2011 (July 31 – August 5, 2011, San Jose, CA). I wanted to personally invite you because of your past involvement and / or active participation in organization of IJCNN or INNS events. The official call-for-proposals, as well as suggested workshop topics can be found at
<http://www.ijcnn2011.org/callforworkshop.php>.

EDITORS' ADDRESS

Soo-Young Lee, Robert Kozma, and Harold Szu
Co-Editors of Tri-Society Newsletters



The Tri-Society Newsletters is a mutual forum of the memberships of INNS, ENNS, & JNNS. It was designed to provide information about the activities of the three societies and their Special Interest Groups (SIGs), and their collaborations with related organizations for joint activities.

INNS SIGs have operated from the start of the society to satisfy the diverse needs of various groups in neural network research. Both topical and geographical SIGs have provided forums for in-depth discussion among researchers from multiple academic disciplines including neuroscience, cognitive science, mathematics, physics, computer science, and electrical engineering. The multidisciplinary nature is one of the unique characteristics of neural networks, and the Tri-Society Newsletters aim to serve as connecting glue by providing related information from multiple disciplines.

We will invite articles from Project Managers and leading researchers on their national or regional research projects on neural networks. Also you can read about the work of the SIGCOM, how does it coordinate and support the SIGs activities in various forms.

The Tri-Society Newsletters also provide forum for introducing recent research achievements as well as exchanging ideas on recent events. We hope that you will find it useful and encourage you to contribute to the Newsletters. Please send your contributions for publication in Tri-Society Newsletters to one of the Editors. Further details on our societies and on the newsletter can be obtained at www.inns.org.

The Tri-Society Newsletters are published by the joint cooperative management of the three neural-networks societies, INNS, ENNS, and JNNS. If you have any question, please contact us at sylee@kaist.ac.kr.

Call For INNS SIG Support Applications

The International Neural Network Society (INNS) Special Interest Groups Committee (SIGCOM) has limited funds to promote and support topical and regional SIG activities. Such activities may include, but are not limited to: invitation of leading experts to workshops, symposia or conferences; travel fellowships for postdocs and PhD students; support for meetings aimed to develop joint research projects.

Applications should be sent to an INNS SIGCOM Financial Sub-Committee member (Peter Andras at peter.andras@ncl.ac.uk).

Each application should include: (1) a brief description of the event, (2) the requested amount (at most \$1000 per application), (3) justification of the amount, (4) a budget detailing how the support will be used, (5) and indication how the event will facilitate INNS SIG activity. For more information on INNS SIG, please visit our web page at: cnd.memphis.edu/sig.

Receipt of applications will be acknowledged. Applications are evaluated as they arrive. Decisions will be communicated to applicants within 4 months after the receipt of the application has been acknowledged. ■

While the official deadline for submission was December 15, we do have a couple openings if you would like to take advantage of this opportunity.

To submit a workshop proposal, simply send me a title; names, brief bio and contact information of organizers; length of the workshop (3–6 hours); a broad organizational plan and justification; and description of the target audience.

If you are interested in organizing such a workshop, if you know someone who may be interested, or have any questions, please feel free to let me know. ■



UPCOMING MEETING: THE 18TH INTERNATIONAL CONFERENCE ON NEURAL INFORMATION PROCESSING (ICONIP2011)

November 14-17, 2011, Shanghai, China
<http://iconip2011.sjtu.edu.cn>

POST-CONFERENCE WORKSHOPS (BRAIN-COMPUTER INTERFACE; CYBERSECURITY AND DATA MINING)

November 18, Hangzhou, China

Bao-Liang Lu

The 18th International Conference on Neural Information Processing (ICONIP 2011) will be held in Shanghai, China. It is an annual event, organized since 1994 in Seoul, Korea, by the Asia Pacific Neural Network Assembly (APNNA). ICONIP 2011 aims to provide a high-level international forum for scientists, engineers, educators, and students to address new challenges, share solutions, and discuss future research directions in neural information processing and real-world applications. The post conference workshops will be held in Hangzhou on November 18 (Friday), 2011. Hangzhou is one of the most important tourist attractions in China for its natural beauty and historical and cultural heritages. The distance between Shanghai and Hangzhou is about 260 kilometres. From Shanghai, you can reach Hangzhou through very comfortable 38-minute high-speed train ride.

Conference committee

General Chair: Bao-Liang Lu
Program Chairs: Li-Qing Zhang and James Kwok
Honorary Chair: Shun-ichi Amari,
Advisory Committee Chairs: Shou-Jue Wang, Aike Guo, Li-Ming Zhang
Organizing Chair: Hong-Tao Lu
Special Sessions Chairs: Changshui Zhang, Akira Hirose, Minh Lee
Workshop Chairs: Xiao-Rong Gao, Guang-Bin Huang, Jie Yang
Tutorials Chair: Si Wu
Publicity Chairs: Kazushi Ikeda, Andrew Chi-Sing Leung, Paul Pang
Publications Chairs: Yuan Luo, Tain-Fang Yao, Yun Li
Registration Chair: Hai Zhao
Finance Chair: Yang Yang
Local Arrangements Chairs: Guang Li, Fang Li

Call for papers, special sessions and workshop proposals

Prospective authors are invited to contribute high-quality papers in the topic areas listed below and proposals for special sessions and workshops. Special sessions, to be organized by internationally recognized experts, aim to bring together researchers in special focused topics. Each special session should include at least 6 contributing papers. A special session proposal should include the session title, a brief description of the scope and motivation, names, contact information and brief biographical information on the organizers. Papers submitted for special sessions are to be peer-reviewed with the same criteria used for the regular papers. Workshops will consist of a panel of invited experts. No individual papers will be submitted and no papers will appear in the proceedings. A proposal for workshop should include a summary statement (2-3 pages) describing the topic and motivation of the workshop and a list of the workshop panelists.

Topic of Areas

Computational Neuroscience and Cognitive Science: Spiking neurons, visual and auditory cortex, neural encoding and decoding, plasticity and adaptation, brain imaging, learning and memory, inference and reasoning, perception, emotion and development, attractor and associative memory.

Models, Methods and Inference: Stability and convergence analysis, neural network models, supervised learning, unsupervised learning, reinforcement learning, embeddings and manifold learning, active learning, statistical and information-theoretic methods, kernel methods and support vector machines, mixture models, graphical and causal models, Bayesian networks, topic models, evolutionary algorithms, Gaussian processes, model selection, matrix/tensor analysis.

Vision and Auditory Modeling: Visual perception and modeling, visual selective attention, visual coding and representation, object recognition, motion and tracking, natural scene analysis, image processing, auditory perception and modeling, source separation, speech recognition and speech synthesis, speaker identification, audio and speech retrieval.

Control, Robotics and Hardware: Neuromorphic hardware and

implementation embedded neural networks, fuzzy neural networks, cognitive robotics, developmental robotics, multi-agent systems and game theory, planning and decision making, action and motor control. Novel Approaches and Applications: Brain-like systems, adaptive intelligent systems, brain-computer interfaces, granular computing, hybrid intelligent systems, neuroinformatics and neuroengineering, bioinformatics, information retrieval, data mining and knowledge discovery, natural language processing.

Paper Submission

Authors are invited to submit full-length papers (10 pages maximum) by the submission deadline through the online submission system. The submission of a paper implies that the paper is original and has not been submitted under review or copyright-protected elsewhere and will be presented by an author if accepted. All submitted papers will be refereed by experts in the field based on the criteria of originality, significance, quality, and clarity. The authors of accepted papers will have an opportunity to revise their papers and take consideration of the referees' comments and suggestions.

Publication of the proceedings

The proceedings of ICONIP 2011 will be published by Springer in its series of Lecture Notes in Computer Science. Furthermore, a selected number of authors will be invited to expand and revise their papers for possible inclusions in "Neurocomputing", a peer-reviewed international journal published by Elsevier.

Important dates

April 1, 2011	Special session proposals
May 1, 2011	Tutorial and workshop proposals
June 1, 2011	Paper submission deadline
August 1, 2011	Notification of acceptance
September 1, 2011	Camera-ready final paper submission
September 1, 2011	Early registration ■

Post-Conference Workshops on Cybersecurity and Data Mining: The 2nd Cybersecurity Data Mining Competition (CDMC2011)

November 18, Hangzhou, China (<http://competition.csmining.org>)

Paul S. Pang



The competition is associated with the 4th International Cybersecurity and Data Mining workshop (CDM2011), which is an associated event to the ICONIP2011, Shanghai, China, November 14 - 17 2011. The entry is open to researchers from community at large. The proceedings of the competition is planned to be published in a journal special issue—details of this is to be determined.

Venue: Hang Zhou, reputed as Silicon Valley in Paradise, is one of the important tourist attractions in China for its natural beauty and historical and cultural heritages. The workshop will be held on 18th, November 2011 (Friday) in Hang Zhou, China.

Objectives: The purpose of the 2nd ICONIP Cybersecurity Data Mining Competition is to increase awareness of Cybersecurity and the potential of industrial applications, and to give young researchers exposure to the main issues related to the topic and to ongoing work in this area. The focus of this competition is on string sequences analysis towards application of knowledge discovery techniques for protecting personal computer information by means of detection, prevention, and response to various attacks.

Prizes and Awards: We have set prizes for the competition. The top ranking teams of all 3 data mining tasks will be eligible to win a cash prize of NZ \$3000. Additional prize may be available as travel grants for deserving participants to help them attend the ICONIP2011 conference and/or the CDM2011 workshop.

Paper submissions and publications: Papers for method description of up to 8 pages are required to be submitted online following the Springer LNCS format. Selected and extended papers will be published in special issues of international journals after the conference. Posters are expected to be in A1 size to fit our boards, otherwise they may not be displayed in poster session.

Deadline for submission: The final submission deadline is the 31st of July 2011, and the competition results will be announced by the 18th, November 2011. ■