Connections

The Newsletter of the IEEE Neural Networks Council

President's Message

Russell C. Eberhart
Research Triangle Institute
IEEE Neural Networks Council President

The International Conference on Neural Networks (ICNN) and FUZZ-IEEE '93 combined conferences held in San Francisco were a great success. Enrique Ruspini and his program committees are to be commended. It was obvious that combining the two meetings was a good idea. Many of the attendees in the neural network sessions were active in fuzzy logic work, and vice versa. The proceedings were again offered both on CDROM and as printed volumes.

The Council's next conference is the Virtual Reality Annual International Symposium (VRAIS), being held in Seattle, Washington,

in September. Tom Furness, Tom Caudell, Bob Marks and the rest of the organizing committees have been working hard to make this, the first IEEE-sponsored conference focused on virtual reality, an event you won't want to miss if you are working on or interested in the field. The papers being presented are of a high technical quality, and a very interesting group of exhibitors will be present.

In October, the Council will co-sponsor the International Joint Conference on Neural Networks in Nagoya, Japan. Profs. Shun-Ichi Amari and Toshio Fukuda are combining their talents to ensure the

success of the first-ever NNC-sponsored conference in Japan. If you have never been to Japan, this is a great opportunity to combine business and pleasure.

Planning is now well along for the World Congress on Computational Intelligence, to be held in Orlando, Florida, in late June, 1994. The congress will include the International Conference on Neural Networks, FUZZ/IEEE '94, and the International Symposium on Evolutionary Computation. It will be held at the same time as the World Cup is in Orlando (the first time it has been held in the United States). The combination of conferences in San

IN 1994
THE INTELLIGENT WORLD IS COMING TO ORLANDO...

IEEE WORLD CONGRESS ON COMPUTATIONAL INTELLIGENCE

FUZZ-IEEE
International Conference on Neural Networks
International Symposium on Evolutionary Computation

WORLD CONGRESS '94 • WORLD CUP

JUNE 26 - JULY 2, 1994
WALT DISNEY WORLD DOLPHIN HOTEL
Orlando, Florida
For Program Information Contact:
Meeting Management
5665 Oberlin Drive, #110
SanDiego, California 92121
619-453-6222

Sponsored by the Neural Networks Council

Sanner and Slotine Awarded Outstanding Paper Award

Robert M. Sanner and Jean-Jacque E. Slotine, have been awarded The Neural Networks Council's Outstanding Paper Award for their paper ""Gaussian Networks for Direct Adaptive Control' (IEEE Trans. on Neural Networks, 3(6):837-863, November 1992.)

The Outstanding Paper Award is awarded by the Neural Network Council to the authors of an outstanding paper published in the *IEEE Transactions on Neural Networks* during the two calendar years preceding the year of the Award. Papers are judged on their potential impact on the foundations of neural network theory, their potential for having a significant practical impact in applications, and on their clarity.

This year's award was made on the basis of recommendations from a committee of associate editors for the *Transactions*. Selected for honorable mention were the following two papers;

Eric Baum, "Neural Net Algorithms That Learn in Polynomial Time from Examples and Queries", *IEEE Trans. on Neural Networks*, 2(1):5-19, January 1991.

Eduardo Sontag, "Feedback Stabilization Using Two-Hidden-Layer Nets", *IEEE Trans. on Neural Networks*, 3(6):981-990, November 1992.

Sanner and Slotine are both affiliated with the Department of Mechanical Engineering at the Massachusetts Institute of Technology (MIT), Cambridge, MA. Professor Slotine is an Associate Professor of Mechanical Engineering and Director of the Nonlinear Systems Laboratory at MIT. Mr. Sanner is currently completing his Ph.D. on adaptive control at MIT.

The award winning paper deals with adaptive neuro-control. To date, there are relatively few results in this area which go beyond empirical studies. This paper provides analyti-

cal results on the convergence properties of direct adaptive controllers based on radial basis function networks. The paper's contributions are perceived as being important to the advancement of control theory and neural network theory. In this respect, Sanner and Slotine's paper provides an excellent example of the way in which neural network analysis can successfully address difficult problems in the traditional system sciences.

Michael Lemmon, Chairman
1993 Outstanding Paper Award
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President's Message (from cover)

Francisco this year is thus being extended to three areas. The Congress hotel is the Walt Disney World Dolphin Hotel, on the Disney property near EPCOT, Disney World and the MGM Studios Theme Park. The Congress is being designed as a family event, with attractions for all ages.

Further information on each of the conferences mentioned above can be found elsewhere in the newsletter, in the Transactions on Neural Networks, and in the Transactions on Fuzzy Systems.

The NNC Virtual Reality Technology Committee met in San Francisco during the ICNN and FUZZ/IEEE '93. Chaired by Tom Caudell, the committee recommended that the IEEE Technical Activities Board (TAB) establish an IEEE-wide Virtual Reality Technology Committee. The NNC AdCom will act upon this recommendation at its meeting in September at VRAIS '93, and if it is ratified, pass it along to the IEEE TAB at its meeting later this year. If passed by TAB, the field of virtual reality could be on its way to becoming an IEEE Council, similar to the Neural Networks Council.

I support this action, because, like neural networks, fuzzy logic and evolutionary computation, the field of virtual reality cuts across many of the IEEE Society fields of interest. To attempt to remove it from the societies would in my opinion be a mistake. To put it into one Society would also be a mistake. The Neural Networks Council has provided a home for some significant virtual reality activities, but the maturing of such a large field seems to warrant the establishment of a new Council.

1993 IEEE International Conference on Neural Networks (ICNN'93)
Second IEEE International Conference on Fuzzy Systems (FUZZ-IEEE'93)

### Enrico H. Ruspini
General Chair, ICNN'93 and FUZZ-IEEE'93

A pioneer combination of the largest technical conferences in the world devoted to fuzzy systems and neural networks.

In recent years, concepts and methods from the fields of fuzzy systems and neural networks have been increasingly used in combination to develop new system modeling and analysis techniques and to understand and control a variety of real-world systems. Neural network techniques, for example, have proven to be extremely useful to refine and adjust the possibility distributions that define fuzzy controllers and fuzzy signal processors. Conversely, ideas from fuzzy logic have been used to generalize the architecture and learning rules of neural networks systems. The increasing number of technological connections between the fields has manifested itself in numerous technical contributions that bridge both disciplines. For example, approximately 20% of the papers presented at the First International Conference on Fuzzy Systems were concerned with combinations of fuzzy logic and neural networks concepts and techniques.

The evolving symbiosis of these new technologies and the realization that advances in the two fields are increasingly intertwined motivated the joint, concurrent meeting of two major technical forums: the 1993 IEEE International Conference on Neural Networks (ICNN'93) and the Second IEEE International Conference on Fuzzy Systems (FUZZ-IEEE'93).

San Francisco, California was the venue, from March 28 to April 1, 1993 of these two major meetings sponsored by the IEEE Neural Networks Council. The format chosen for this combined event allowed participants to either conference to attend all functions and programs of both conferences. Over 1200 participants were able to attend a rich program of tutorials, exhibits, technical sessions, social functions and tours.
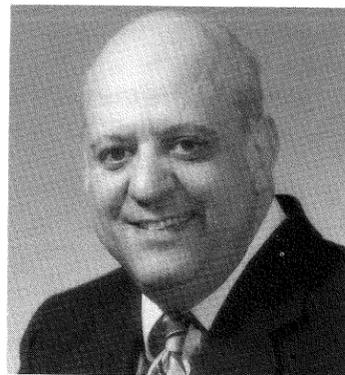
Enrique H. Ruspini is with the Artificial Intelligence Center, SRI International

The technical programs prepared by the Program Chair of FUZZ-IEEE'93, **Dr. Piero P. Bonissone**, and by the Program Cochairs of ICNN'93, **Dr. Hamid Berenji, Professor Elie Sanchez,** and **Professor Shiro Usui,** were especially designed to foster interdisciplinary communication while maintaining the individual character of each conference.

The plenary session program, for example, included two joint sessions, or "superplenaries" featuring talks by **Professors Lotfi A. Zadeh, Bernard Widrow, Carver Mead, and Teuvo Kohonen.** Plenary sessions of ICNN'93 included talks by **Dr. Piero Bonissone, Dr. Richard Sutton, Professor Kumpati Narendra,** and **Professor John Koza** while plenary sessions of FUZZ-IEEE'93 included talks by **Professor E. Mamdani, Professor Michio Sugeno, Dr. Hamid Berenji,** and **Professors Didier Dubois** and **Henri Prade.** Two of these plenary talks (by Dr. Bonissone and Dr. Berenji) were specially prepared to introduce each community to significant concepts and advances of the other.

•Tutorials

The tutorial program of the joint meeting, organized by **Professor James Bezdek,** also emphasized interdisciplinary themes, ranging from applications of fuzzy logic and neural networks to control systems, computer vision, and pattern recognition to discussions of approaches based on combination of genetic algorithms and neural networks and of expert systems and neural networks. Other tutorials included presentations on basic concepts of fuzzy set theory, neural networks, and evolutionary programming; hardware approaches to fuzzy logic; applications of fuzzy logic to databases and neural networks; and—in keeping with the multidisciplinary orientation of the event—on the role of cognitive-science concepts in neural networks applications.

The technical session program for both conferences included more than 600 contributions, of which approximately 350 were presented as part of ICNN'93 and 250 as part of FUZZ-IEEE'93. Invited sessions were organized on a variety of topics ranging from reinforcement learning and recurrent neural networks to various aspects of fuzzy reasoning and its applications. A significant number of participants attended sessions dealing with genetic algorithms and industrial applications of fuzzy logic, which, I am happy to report, will figure prominently in future NNC-sponsored meetings.

The organizing committee was particularly pleased with the response of participants to sessions dealing with interdisciplinary subjects such as the role of biological evolution in computation and various aspects of the symbiotic relation between fuzzy logic and neural networks.

•Exhibits

Nearly 30 exhibitors participated in the joint Exhibits program displaying a variety of products and services ranging from books and software systems to various forms of hardware. "Flakey", an autonomous mobile robot developed by SRI International that uses a fuzzy controller, thoroughly and consistently roamed the exhibition floor during coffee breaks, sometimes sporting ICNN'93 and FUZZ-IEEE'93 T-shirts.

•Electronic Proceedings

Both ICNN'93 and FUZZ-IEEE'93 followed in the pioneering footsteps of IJCNN'92 by producing CD-ROM versions of the Conference Records. These CD-ROM Proceedings, which were produced by Young Minds, Inc. of Redlands, California, may be accessed using a proprietary software package (ViewTool) that supports a wide variety of hardware platforms ranging from personal computers to a variety of engineering workstations.

•Practitioner's Workshops

An innovation, introduced in the context of FUZZ-IEEE'93, was the inclusion, as a complement to the technical program, of "Practitioner's Workshops." Practitioner's workshops are informal gatherings intended to describe significant case histories and experiences in the application of a particular technology. The objective of practitioners' workshops is to provide newcomers to the field with significant information about the problems faced by those who successfully accomplished the technological transfer of theoretical ideas into actual commercial and industrial products. The pilot practitioners' workshop for FUZZ-IEEE'93 was organized by **Dr. Earl Cox** on the topic of commercial and business applications of fuzzy logic.

•Video Proceedings

Also appearing for the first time in an NNC-sponsored conference was the first of a planned series of Video Proceedings, which was jointly produced by the NNC and the IEEE Educational Activities Board. Video Proceedings are collections of video segments showing significant research advances that cannot be easily conveyed in other formats. For this initial edition of a joint ICNN/FUZZ-IEEE'93 Video Proceedings, **Aviv Bergman,** of Interval Research Corporation, and I solicited a number of contributions from leading researchers in the fields of fuzzy logic and neural networks. These clips were edited and combined with narrative explanations about each contributed segment, and, more generally, about the nature of each discipline and its major problems. The result, produced with the assistance of the Stanford Instructional Television Network, is a new IEEE video entitled "Fuzzy Logic and Neural Networks: Clips from the Field."

The positive participant response to ICNN'93 and FUZZ-IEEE'93 expressed through personal comments and written evaluations are most reassuring indications of the timeliness and value of such a joint meeting and are a most appreciated reward for the efforts devoted by the IEEE volunteers who planned and organized these conferences.

In closing, I would like to thank the Program Chairs of both conferences; **Richard Tong,** who promptly and diligently took care of our finances; **Wei Xu,** who organized and promoted the Exhibits Program; **Camerone Welch,** who handled press and public relations; **Andy Worth,** who coordinated volunteer activities; **Aviv Bergman,** who chaired the Video Proceedings effort; **Alessandro Saffiotti,** who provided valuable real-time assistance and participated in the video effort; **Jim Bezdek,** for his confidence and for the organization of the tutorial program, and to all members of the Program and Organizing Committees, who made the San Francisco conferences such a big success. Special thanks also go to **Nomi Feldman** and her team at Meeting Management for their skillful organizational support. Finally, all of us involved in ICNN'93 and FUZZ-IEEE'93 are most grateful to **Russ Eberhart, Bob Marks,** and the Neural Networks Council for their confidence and unwavering support.

Hard-working AdCom members labor under the gaze of Jack London and Mark Twain

Renowned juggler Toshio Fukuda and fellow performers

The IEEE gets connected

Rosalyn Snyder
Managing Editor, IEEE-NNC Connections

E-mail is a wonderful thing, combining the civility of letters and the convenience of telephones. The IEEE is in the midst of an ambitious effort to utilize e-mail technology to the maximum.

A large part of the program is already in place. Although some of the services advertised are not yet completely on line, the directories are not complete, and there is sometimes a delay in response, but on the whole it is working very well.

You can use the IEEE e-mail system to contact other IEEE members and staff, to obtain information, and to request services such ordering publications.

A new service, ASKIEEE, enables members to order copies of individual articles published by the IEEE and others. Orders are delivered by mail or fax.

The IEEE e-mail system has been in operation since 1990. Most IEEE staff members in New York, Washington and Piscataway, and about 2000 volunteers have been assigned mailboxes. There are also special service mailboxes which members can query to order publications, get help with delivery problems, and obtain information. The aliases follow the format `[i].[name]@ieee.-org`. This format has the advantage that if you know someone's name and

nothing more, you have a good shot at successfully sending email! (*If you're sending "blind", increase your odds by trying the alias addresses with one and two (or more initials, e.g. r. snyder@ieee.org and r.g.snyder@ieee.org)*)

Mail received at the IEEE mailbox is immediately forwarded to the addressee's "home" email address at his/her business or institution as long as it is part of an e-mail system that has an Internet gateway. The forwarding system is so smooth that recipients are often unaware that the mail was sent via ieee.org.

Volunteers can update their addresses by email, and everyone is sent update forms annually so that the forwarding addresses can be kept as accurate as possible. This can be a great help when your system supervisor assigns new email addresses to everyone the week after you have attended a conference and distributed two hundred business cards with the old address. Active volunteers especially are encouraged to apply for IEEE aliases, but any IEEE member may request an alias and be included in the directory. The response has been "very positive", according to the auto-response message I received, so it may require more than the promised 24 hours to receive your alias and directory listing. Be patient. You will receive a test message with your alias.

To receive an electronic directory of individuals on the system, mail `info.directory@ieee.org`. Many volunteers without Internet access can get on the system through Compmail. Compmail is a contract between the IEEE Computer Society and U.S. Sprint. Users may also access e-mail through MCI Mail or Compuserve or any commercial vendor with a gateway to the Internet. The volunteer needs a personal computer, modem and some software. There are no guest accounts.

Avoid System Abuse!!

Electronic junk mail is despised just as much as the paper variety. Assemble and use email distribution lists carefully, and invite recipients to request deletion from your list (and delete those who ask!).

Try it, yourself!

To be listed on the IEEE e-mail directory and obtain an IEEE alias, send a message with the following information to
`aliases@ieee.org`
(a) your e-mail address
(b) your LAST name
(c) your FIRST name and initial
(d) your day-time phone number
(e) your FAX number (if available)
(f) your IEEE member number (If you are a non-member volunteer, e.g. working on a Standards group - please ask your group chair, who will be an IEEE member, to process your request)
(g) your current major IEEE volunteer activity involvement (committee positions, etc.)

You don't have to be "in the system" to use it. Here's how.

info.info@ieee.org

Mail to this alias gets you a list of about 71 auto-response text files. If an e-mail message (not really a message, but a request using a message format) is sent to an alias that begins with "info", the message content is discarded and a pre-written text file is automatically returned to the sender.

For example a message to `email.guide@ieee.org` responds with t he latest version of the IEEE E-mail guide.

info.service@ieee.org

Mail to this alias prompts a list of the services provided by email. For instance, if your renewal check was cashed and you received a second bill, send mail to *membership.inquiry@ieee.org*, and it will be forwarded to a person who can help you straighten it out! The list includes the 5 directory aliases for volunteers, staff, sections, branches, and societies.

Bob Alden of McMaster University is chair of the IEEE Electronics Steering Committee. Send comments to him at r.alden@ieee.org. Thanks to IEEE staffer Jayne Cerone, who provided details on the IEEE email system.

UseNet IEEE Newsgroups

There is as yet no general IEEE bulletin board. However, If you have access to UseNet newsgroups, there are 17 "newsgroups" which have information on specific topics. A single information item could be added to the directory of a number of these "newsgroups." The IEEE-related newsgroups are:
ieeenet.news.newusers

ieee.rab.general	ieee.pcnfs
ieee.announce	ieee.tab.announce
ieee.regional	ieee.rab.announce
comp.org.ieee	ieee.tab.general
ieee.usab.general	ieee.usab.announce
ieeenet.test	ieeenet.netlog
ieee.config	ieeenet.tcos
ieeenet.logs.zeus	
ieee.general	

RIGs Notes

Rick Alan
TRW Safety Systems
Chair, IEEE-NNC Regional Interest Groups

ICNN/FUZZ-IEEE 93

The San Francisco ICNN/FUZZ-IEEE conference was like eating ice cream; cool and delicious. The RIGs Committee was recognized for its successful efforts to promote the field around the world by being upgraded from "ad hoc" to "Standing".

The first RIGs luncheon was also held with representatives from around the world attending. A splendid time was had by all.

Mo-Yuen Chow Appointed

Dr. Mo-Yuen Chow of the North Carolina RIG has been appointed to the RIGs Committee in charge of establishing new Groups worldwide. If you would like to be able to attend RIGs meetings locally, please let him know so he can contact your Section Chairman. The meetings are fun and an excellent investment in your future. Mo-Yuen can be reached at chow@eos.ncsu.edu.

IEEE Metric Policy Draft

The following is a summary of actions taken at the March 23 meeting of the IEEE Metric Policy Committee. Send comments to:
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The IEEE will:
1. Actively support the use of the SI metric system in electrical and electronics engineering.
2. Use SI units exclusively to express measured and calculated values of quantity in all IEEE publications, including standards.* With respect to existing standards, this policy shall take effect with the next revision; with respect to other publications, no later than January 1, 1995.
3. Use the current issue of IEEE Standard 268.
4. Promote the use of SI in education at all levels.

It is recognized that certain exceptions to this policy will be necessary (e.g., where a conflicting world industry practice exists). These exceptions must be evaluated and approved by the appropriate Institute board on an individual basis, and for a specific period of time, and reported to the Board of Directors.

Lotfi Zadeh Wows Seattle

Lotfi Zadeh visited the Seattle RIG (Colin Wiel, Chairman) in April and drew 104 people. Reports are that it was an exciting presentation (as always). Zadeh visited under the NNC Distinguished Lecturer Program.

Phoenix RIG Video

The Phoenix RIG is sponsoring a video project highlighting the motivations of engineers in Computational Intelligence (you). It is currently in development. If you have an interest in being interviewed for it, please send a videotape of yourself answering the following three questions:

•*What's the most exciting thing in Computational Intelligence to you?*

•*What's the most interesting speculative future development in CI you can think of?*

•*What is the value of engineering?*
Please feel free to include any other material you think may be of interest.
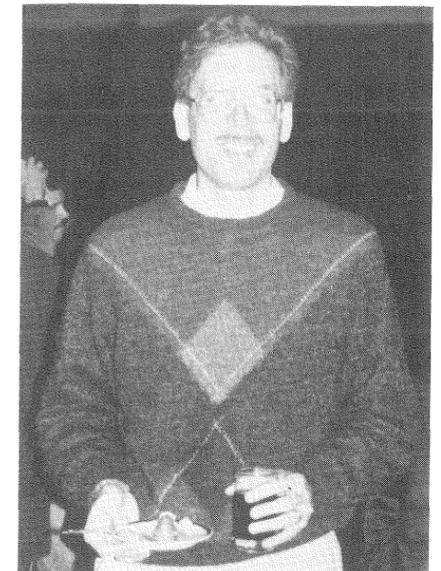
What we're looking for are persons able to show emotion about engineering, e.g., a friendly excitement about some special idea you have or value you place on the field.

WCCI Publicity Chairman

Rick Alan (that's me!) was appointed to head the NNC World Congress on Computational Intelligence Publicity Committee. The Congress is to take place in Orlando next June. If you would like to assist this effort by placing brochures at conferences you will be attending please let me know (e-mail: r.alan@ieee.org). I would also be very interested in hearing your suggestions and criticisms regarding how we can provide a Congress that maximizes your satisfaction.

See you there!
To organize a new RIG (Regional Interest Group), contact:
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email 70324.1625@compuserve.com

NNC Standards Committee

Walter Klarplus, UCLA
Mary Lou Padgett, Auburn University

Now in its third year of operation, the Standards Committee of the Neural Networks Council (NNC) invites your participation in its working groups and other activities. IEEE is one of the primary standards organizations in the United States and is currently maintaining over 1500 active standards in the electrical and electronic areas. The IEEE Standards Board has established formal procedures for the initiation of standards projects via Project Authorization Requests (PAR), balloting to approve standards, and the eventual publication of standards. The NNC is represented on the IEEE Standards Board and has made standardization one of its principal activities.

At present three active Working Groups are developing standards in the following areas:

•Definition of Terms for Artificial Neural Networks;
• Guidelines for the Evaluation of Artificial Neural Networks Hardware;
• and Software Interfaces for Artificial Neural Networks.

Additional Working Groups interested in Fuzzy Systems and in Virtual Reality are in the process of formation. These groups interact by e-mail and strive to meet once or twice per year at major conferences.

It may be that VR standards will be taken out of the NNC to gain broader participation.

Mary Lou Padgett, Lofti Zadeh, a student volunteer, and Hamid Berenji at ICNN/IEEE-FUZZ93

For further information, please contact the chair, Professor Walter Karplus, Vice Chair, Mary Lou Padgett or any of the working group chairs listed below. Your input is vital to the success of this effort!

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Standards Calendar

First Boston-Area Fuzzy Logic Workshop

Allen R. Bonde Jr.,Workshop Chair

On February 25, 1993, the First Boston-Area Fuzzy Logic Workshop was held at GTE Laboratories in Waltham MA, in cooperation with the IEEE Neural Networks Council.This meeting provided a much needed local forum for fuzzy logic researchers, practitioners, and enthusiasts in the greater Boston area. In addition, it served as an initial planning meeting for discussing future activities and events. The inaugural workshop attracted 35 participants, representing 12 companies and 5 universities.

Much credit for the success of this endeavor also goes to my organizing committee: John Terrell and Nancy Millstrom from GTE Government Systems, and John Doleac and Judy Franklin from GTE Laboratories, and to the GTE Laboratories support staff.

The technical program consisted of eight invited and submitted talks from the local fuzzy logic research community. These talks addressed a broad range of topics including fuzzy theory and tools, and applied fuzzy techniques in decision support, control, communication network management, signal processing, and information systems.

• **Fuzzy Logic for Bayesians: Fuzzy Sets as Equivalence Classes of Random Sets (ECORS)**
According to *Fred Daum (Raytheon Company)*, while ECORS are rather difficult to describe and manipulate in Bayesian formalisms, they are simple primitives in fuzzy logic. This relationship offers to greatly reduce the computational complexity of some estimation algorithms for problems with uncertain origin of measurement (such as multiple target tracking).

•**Using the G2 Diagnostic Assistant for Developing Real-time Fuzzy Applications**
Steven Fraleigh (Gensym Corporation described a commercial software product that supports the graphical configuration of fuzzy logic networks and control architectures. Fraleigh noted that Gensym is actively exploring the union of fuzzy logic with neural techniques,

and has particular interest in the similarities between radial basis function ANNs and fuzzy membership functions.

• **INSITE: An Algorithm for Mapping Trained Neural Networks to Fuzzy Rules**
The principal motivation behind *Allen Bonde's* paper is to look at ways to add an explanation capability to trained, feed-forward neural networks. In particular, it is often helpful and sometimes necessary to know how a network has reached a decision, or what it has learned. The INSITE approach, which builds on previous efforts, combines a pruning technique with a mapping of network elements to fuzzy if/then rules.

•**Fuzzy Control Engineering: 1973-1993**
Judy Franklin (GTE Laboratories) provided an historical overview of fuzzy logic in control engineering. Franklin also compared and contrasted the important issues and challenges during each time period. Beginning with Mamdani's seminal work, fuzzy control and systems analysis has grown to become one of the most successful and visible applications of approximate reasoning.

Applications Papers

• **A Fuzzy Logic Representation of Knowledge for Detecting/Correcting Network Performance Deficiencies**
Lundy Lewis (Cabletron Systems R&D Center) discussed some of the challenges of "intelligent" communications networking, and provided an insightful view of the potential role of fuzzy models. A traditional approach to fault detection and correction is to construct algorithms that translate the numerical reading of a network monitor into symbolic variables, and then make inferences via expert-derived rules. However, this type of rule-based framework can suffer from "brittleness" and knowledge acquisition problems. As Lewis described, an alternative fuzzy logic approach offers to overcome these two limitations.

•**A Hybrid Neural-Fuzzy Approach to Signal Recognition and Analysis**
Nancy Millstrom, GTE Government Systems proposed a unique hybrid architecture for real-time monitoring of the VHF band for interference and unauthorized usage. In their design, fuzzy logic is used to enhance traditional FSK detectors and to integrate the FSK results with a neural network classifier. Millstrom described how the fuzzy decision-making techniques provided significant performance improvements as compared to binary logic, and reduced both the number of rules and coding requirements.

Security Issues in Information Systems

•**Fuzzy Logic and Multilevel Database Systems**
Bhavani Thuraisingham (MITRE Corporation) described how multilevel security constructs could be incorporated into a fuzzy relational data model. In addition, she noted and illustrated that approximate reasoning could be used in multilevel secure database systems to more effectively handle situations where users deduce unauthorized information from a series of authorized queries.

•**Using Fuzzy Logic to Resolve Policy Conflicts in Multipolicy Computer Security Paradigms,**
Hilary Hosmer (Data Security Inc.), reviewed issues in security policy and "metapolicies," and initiated a lively discussion of the potential role of applied fuzziness in this domain.

Alan Bonde, Jr. is with GTE Government Systems, Needham, MA.

World Congress on Computational Intelligence

International Conference on Neural Networks
FUZZ/IEEE '94
IEEE International Symposium on Evolutionary Computation

June 26 - July 2, 1994
Walt Disney World Dolphin Hotel,
Lake Buena Vista, Florida

Sponsored by the IEEE Neural Networks Council

IEEE INTERNATIONAL CONFERENCE ON NEURAL NETWORKS

General Chair
Steven K. Rogers
United States Air Force
Institute of Technology
rogers@afit.af.mil

Topics: Applications, architectures, artificially intelligent neural networks, artificial life, associative memory, computational intelligence, cognitive science, embedology, filtering, fuzzy neural systems, hybrid systems, image processing, implementations, intelligent control, learning and memory, machine vision, motion analysis, neurobiology, neurocognition, neurodynamics, optimization, pattern recognition, prediction, robotics, sensation and perception, sensorimotor systems, speech, hearing and language, system identification, supervised and unsupervised learning, tactile sensors, and time series analysis.

FUZZ/IEEE '94

General Chair
Piero P. Bonissone
General Electric Corporate
Research and Development
bonissone@crd.ge.ge.com

Topics: Basic principles and foundations of fuzzy logic, relations between fuzzy logic and other approximate reasoning methods, qualitative and approximate-reasoning modeling, hardware implementations of fuzzy- logic algorithms, design, analysis, and synthesis of fuzzy-logic controllers, learning and acquisition of approximate models, relations between fuzzy logic and neural networks, integration of fuzzy logic and neural networks, integration of fuzzy logic and evolutionary computing, and applications.

IEEE CONFERENCE ON EVOLUTIONARY COMPUTATION

General Chair
Zbigniew Michalewicz
University of North Carolina,
Charlotte
zbyszek@mosaic.uncc.edu

Topics: Theory of evolutionary computation, evolutionary computation applications, efficiency and robustness comparisons with other direct search algorithms, parallel computer applications, new ideas incorporating further evolutionary principles, artificial life, evolutionary algorithms for computational intelligence, comparisons between different variants of evolutionary algorithms, machine learning applications, evolutionary computation for neural networks, and fuzzy logic in evolutionary algorithms.

INSTRUCTIONS FOR ALL THREE CONFERENCES

Papers must be received by **December 10, 1993**. Papers will be reviewed by senior researchers in the field, and all authors will be informed of the decisions at the end of the review proces. All accepted papers will be published in the Conference Proceedings. Six copies (one original and five copies) of the paper must be submitted. Original must be camera ready, on 8.5x11-inch white paper, one-column format in Times or similar fontstyle, 10 points or larger with one-inch margins on all four sides. Do not fold or staple the original camera-ready copy. Four pages are encouraged. The paper must not exceed six pages including figures, tables, and references, and should be written in English. Centered at the top of the first page should be the complete title, author name(s), affiliation(s) and mailing address(es). In the accompanying letter, the following information must be included: 1) Full title of paper, 2) Corresponding authors name, address, telephone and fax numbers, 3) First and second choices of technical session, 4) Preference for oral or poster presentation, and 5) Presenter's name, address, telephone and fax numbers. Mail papers to (and/or obtain further information from): World Congress on Computational Intelligence, Meeting Management, 5665 Oberlin Drive, #110, San Diego, California 92121, USA (email: 70750.345@compuserve.com, telephone: 619-453-6222).

Calendar

If you have any conference details to add to this list, please send (preferably) a Call For Papers to
Paul Bakker
Computer Science Dept.
The University of Queensland
Queensland QLD 4072
Australia Fax: +61 7 365 1999
bakker@cs.uq.oz.au

We have decided to include some deadlines even after the official cutoff since these are sometimes changed. Email or fax submissions are not usually acceptable. Please contact the program chair or other contact for submission requirements. The designation [passed] refers to the deadline date.

•Upcoming events (past cutoff)

•July 1993

•**World Congress on Neural Networks** (WCNN'93) 11-15 Jul 93Portland, OR, USA *[passed]* "Interdisciplinary; emphasizes the dynamic interplay of neurobiological modelling with advanced engineering and technological applications" *Contact*: WCNN'93 Talley Management Group Inc. (Fax: +1 609 853-0411)

•**3rd Int'l Conference for Young Computer Scientists** (ICYCS'93)15-17 Jul 93 Beijing, China *[passed]* "Artificial Neural Networks" *Contact*: ling@csd.uwo.ca (Prof. Charles X. Ling)

•**The Fifth Int'l Conference on Genetic Algorithms** (ICGA-93) 17-22 Jul 93 Urbana-Champaign, USA *[passed]* "Genetic algorithms and their relation to neural networks" *Contact*: icga93@unmvax.cs.unm.edu (program & submissions) rob@comec4.mh.ua.edu (general)

•**Int'l Congress on Computer Systems and Applied Mathematics** 19-23 Jul 93 St. Petersburg, [*1 May 93]* "Neural nets" *Contact*: serge@spfac.lgu.spb.su (Dr. Sergey S. Voitenko)

•**Annual Conference of Japanese Neural Network Society** 21-23 Jul 93 Iizuka, Japan *[passed]* "Neuroscience, Cognitive Science, Models & Algorithms, Hardware, Applications" *Contact:* yasui@ces.kyutech.ac.jp (Prof. Shozo Yasui)

•**Simulating Societies '93** 24-26 Jul 93 Siena, Italy *[passed]* "Approaches to simulating social phenomena and social processes" *Contact*: gng@soc.surrey.ac.uk (Prof Nigel Gilbert)

•**Asia-Pacific Workshop on Advances in**

Motion Control 26-27 Jul 93 Singapore *[passed]* "Neural Network, Fuzzy Systems and Expert Systems in Motion Control" *Contact*: eleleeth@nusvm.bitnet (Dr. T. H. Lee)

•August 1993

•**Second Annual Computation and Neural Systems Meeting** (CNS*93) 31 Jul-6 Aug 93 Washington, D.C., USA *[passed]* *Contact*: cp@smaug.cns.caltech.edu (Chris Ploegaert)

•**XIX Latin American Informatics Conference** 2-6 Aug 93 Buenos Aires, Argentina *[passed]* "Connectionism and Neural Networks" *Contact*: mendel@db.toronto.edu (Alberto Mendelzon)

•**The 5th University of New Brunswick AI Symposium** (Theme: "Are We Moving Ahead?") 11-14 Aug 93 Fredericton, Canada *[passed]* "Vision, Learning, Knowledge Representation, Cognitive Science" *Contact*: goldfarb@unb.ca (Lev Goldfarb)

•**Neural Network Applications to Signal Processing** (NNASP'93) 17-20 Aug 93 Singapore [30 Apr 93] "Speech recognition, image processing, adaptive filtering,.." *Contact*: NNASP'93 Secretariat (fax: +65 292 8596)

•**North American Fuzzy Information Processing Society Conference** 22-26 Aug 93 Allentown, PA, USA *[1 May 93]* (abstract) "Neural networks and fuzzy artificial intelligence" Contact: Prof. Marialuisa McAllister (Fax: +1 215 861-1466)

•**8th IEEE Int'l Symposium on Intelligent Control** 25-27 Aug 93Chicago, IL, USA *[passed]* "Neural networks / neural control" *Contact*: farrell@draper.com (Jay A. Farrell)

•**Int'l Joint Conference on Artificial Intelligence** (IJCAI'93) 29 Aug-3 Sep 93 Chambery, France *[passed] Contact*: wahlster@cs.uni-sb.de

•September 1993

•**IEEE Workshop on Neural Networks for Signal Processing** 7-9 Sep 93 Baltimore, MD, USA *[passed] Contact*: (Karin Cermele) kic@learning.siemens.com

•**Int'l Conference on Artificial Neural Networks** (ICANN'93) 13-16 Sep 93 Amsterdam, Holland *[passed]* "Principles from neurobiology; Physical & mathematical theories; Cognitive connectionism; Robotics; Applications" *Contact*: icann@mbfys.kun.nl

•**15th Linz Seminar on Fuzzy Set Theory.** 15-19 Sept 93. Linz, Austria. *15 May 93 Contact:* k312570@edvz.uni-linz.ac.at

(Erich Peter Klement)

•**Int'l Symposium on IC Technology, Systems & Applications** (ISIC-93) 15-17 Sep 93 Singapore *[passed]* "Integrated Circuits and Systems: Artificial Neural Networks" *Contact*: NTUISIC@NTUVAX.BITNET (Ms Annabel Ooi)

•**Virtual Reality Annual Int'l Symposium** (VRAIS'93) 18-22 Sep 93 Seattle, WA, USA *[passed]* "Technical work in virtual reality technology; Neural networks, artificial intelligence, fuzzy logic, parallel processing, ..." *Contact*: Meeting Management, San Diego, California (Fax: +1 619 535 3880)

• **Artificial Intelligence Technology Transfer Conference** 22-24 Sep 93 Monterrey, Mexico *[passed]* "AI techniques such as neural networks, fuzzy systems, cognitive systems" *Contact*: r.soto@ieee.org (Rogelio Soto)

•**Neuronet'93** 20-26 Sep 93Prague, Czech. *31 May 93 (abstracts)* "Theory and applications of neural networks" *Contact*: c11.bitnet (Mirko Novak)

•October 1993

•**Int'l Conference on Signal Processing Applications & Technology** (ICSPAT '93) 28 Sep-1 Oct 93 Santa Clara, CA, USA *[30 Apr 93]* "Neural Networks, Parallel Processing" *Contact:* (Amnon Aliphas) DSPWorld@world.std.com

•**Workshop on Integration Technology for Real-Time Intelligent Control Systems** (IRTICS'93) 5-7 Oct 93 Madrid, Spain *[passed]* "Integrating Expert Systems, Neural Networks, Fuzzy Logic.." *Contact*: CHIOZZA@iic.uam.es (Enrica Chiozza)

•**IEEE SMC'93 Conference** 17-20 Oct 93 Le Touquet, France *[passed]* "Special Session: Applications of Neural Networks to Control Problems" *Contact*: dominique@v31002.decnet.citilille.fr

•**International Workshop on Applications of Neural Networks to Telecommunications** 18-20 Oct 93 Princeton, NJ *[14May 93] Contact*: tony@bellcore.com (Tony Jayakumar)

•**Int'l Workshop on Applications of Neural Networks to Telecommunications** 18-20 Oct 93 Princeton, NJ, USA *[14 May 93] (summary)* "Speech Recognition, Fraud Detection, Financial and Market Prediction." *Contact*: bg1@faline.bellcore.com (Betty Greer)

•**AAAI Fall Symposium Series:** Machine Learning in Computer Vision: What, Why, and How. 22-24 Oct 93 Raleigh NC *[June 4] Contact*: kwb@csee.usf.edu. (Kevin

Bowyer).

- **Int'l Conference on Application-Specific Array Processors** (ASAP'93) 25-27 Oct 93 Venice, Italy *[passed]* "Applications that Require Specialized Computing Systems: Neural Networks" *Contact:* dadda@ipmel2.elet.polimi.it (Prof. Luigi DADDA)

- **Int'l Joint Conference on Neural Networks** (IJCNN '93) 25-29 Oct 93 Nagoya, Japan *[30 Apr 93] Contact:* IJCNN'93-NAGOYA Secretariat (Fax: +81-52-561-1241) (Phone: +81-52-561-9880/8655)

- *November 1993*

- **Int'l Conference on Neural Networks and Signal Processing** (ICNNSP'93) 2-5 Nov 93 Guangzhou, China *[passed] Contact:* Prof. Zhen-Ya He (Fax: +86 25 714212)

- **Computational AI Conference** (WNN93)/ Tutorials and Standards Seminar (FNN93) 7-10 Nov 93 San Francisco, CA, USA *[1 Jun 93* "Neural Networks, Fuzzy Logic, Virtual Reality" *Contact:* (Mary Lou Padgett) mpadgett@eng.auburn.edu

- **Int'l Simulation Technology Conference 93** (incorporating WNN93, a Neural Networks conference) 7-10 Nov 93 Clear Lake, TX, USA *[1 May 93]* "Parallel and Distributed Processing, Fuzzy Logic, Neural Networks" *Contact:* (Mary Lou Padgett) mpadgett@eng.auburn.edu

- **4th Workshop on Algorithmic Learning Theory** (ALT'93) 8-10 Nov 93 Tokyo, Japan *[30 Apr 93]* "Learning Mechanisms in Neural Networks and Pattern Recognition" *Contact:* alt93@cs.uec.ac.jp

- **3rd Int'l Conference on Automation, Robotics and Computer Vision** (ICARCV'94) 8-11 Nov 93 Singapore *[30 Apr 93]* "Neural Networks and Fuzzy Systems; AI & Expert Systems" *Contact:* ensundara@ntuvax.ntu.ac.sg (Professor N. Sundararajan)

- **5th IEEE Int'l Conference on Tools with Artificial Intelligence** 8-11 Nov 93 Boston, MA, USA *[passed]* "Artificial neural networks" *Contact:* jm@cs.toronto.ca (John Mylopoulos)

- **Australian Joint Conference on Artificial Intelligence** (AI'93) 17-19 Nov 93 F Melbourne, Australia *[28 May 93]* "Machine Learning; Neural Networks & Genetic Algorithms" *Contact:* Trudi Dwyer (fax: +61 002 34 4464)

- **Artificial Neural Networks in Engineering** (ANNIE'93) 14-17 Nov 93. St. Louis, Missouri. *Contact:* (Dr. Cihan H.

Dagli) c3260@umrvmb.bitnet or c3260@umrvmb.umr.edu

- **First Asian Fuzzy Systems Symposium.** 23-26 Nov 93. Singapore *Contact:* isschenv@nusvm (Vicky Toh)

- **The First New Zealand Int'l Two-stream Conference on Artificial Neural Networks and Expert Systems** (ANNES'93) 24-26 Nov 93 Dunedin, New Zealand *[30 Apr 93] Contact:* gporteous@otago.ac.nz (Ms Gina Porteous)

- **Neural Information Processing Systems** - Natural and Synthetic- (NIPS*93)29 Nov-2 Dec 93 Denver, CO, USA *[22 May 93] Contact:* cowan@synapse.uchicago.edu (Jack Cowan)

- *December 1993*

- **5th IEEE Symposium on Parallel and Distributed Processing** 1-4 Dec 93 Dallas, TX, USA *[1 May 93]* "Neural Networks, Parallel Algorithms, Artificial Intelligence" *Contact:* pakzad@ecl.psu.edu (S. Pakzad)

- **Conference on Computational Learning Theory** (EURO-COLT '93) 20-22 Dec 93 London, UK *[15 May 93]* "Learning algorithms and the theory of machine learning, including artificial and biological neural networks." Contact: john@cs.rhbnc.ac.uk (John Shawe-Taylor)

- *January 1994*

- **27th Annual Hawaii Int'l Conference on System Sciences** Mini-Track on Neural Network Applications in Organizations 4-7 Jan 94 Maui, HI, USA *[1 Jun 93]* "Bond rating, forecasting, data analysis, production scheduling ..." *Contact:* (Prof. Tim Hill) thill@uhunix.uhcc.hawaii.edu

Calls for Papers

- *June/July 1993 Deadlines*

- **EP'94: 3rd Annual Conference on Evolutionary Programming.** 24-25 Feb. 1994. [30 June 1993] Contact: Dr. Lawrence J. Fogel, ORINCON Corporation, 9363 Towne Centre Dr., San Diego, CA 92121.

- **2nd Int'l Conference on Fuzzy Theory & Technology** 13-16 Oct 93 Durham NC *[15 Jun 93] Contact:* ppw@ee.egr.duke.edu (Paul P. Wang)

- **2nd Neural Computation and Psychology Workshop: Language and Memory** 10-13 Sep 93 Edinburgh, UK *[not given]* Contact: joe@uk.ac.ed.cogsci (Joe Levy)

- **First Australian and New Zealand Conference on Intelligent Information Systems** (ANZIIS-93) 1-3 Dec 93 Perth, WA, Australia *[Jun 93]* "Neurobiological

systems, neural networks, neurofuzzy controls" *Contact:* (Ms V. Di Giacomo) violetta@swanee.edu.wa.edu.au

- **Workshop on the Cognitive Science of Natural Language Processing** 26-27 Jul 93 Dublin, Ireland *[14 Jun 93]* "computational modelling" *Contact:* (Ronan Reilly) rreilly@nova.ucd.ie

- **National Conference on AI and Expert Systems** (CNIASE'93) 19-22 Oct 93 Barquisimeto, Venezuela *[15 Jun 93]* "Connectionist Architectures, Neural Networks Applications, Knowledge-based Systems, Theoretical AI..." *Contact:* itorres@conicit.ve

- **1993 Int'l Symposium on Artificial Neural Networks** (ISANN'93) 20-22 Dec 93, Hsinchu, Taiwan *[15 Jun 93] Contact:* isann93@hsinchu.csie.nctu.edu.tw

- **Digital Image Computing: Techniques and Applications** (DICTA'93) 8-10 Dec 93 Sydney, NSW, Australia *[25 Jun 93] (abstracts)* "Fuzzy logic and neural networks" *Contact:* dicta93@ee.uts.edu.au

- **Computational Learning and Natural Learning Workshop** (CLNL'93) 10-12 Sep 93 Provincetown, MA, USA *[30 Jun 93]* "connectionist learning, statistics" *Contact:*clnl93@learning.scr.siemens.com

- **Int'l Symposium on Computer and Information Sciences** (ISCIS VIII) 3-5 Nov 93 Antalya, Turkey *[30 Jun 93]* "Neural Networks, Parallelism, Artificial Intelligence" *Contact:* iscis@vm.cc.metu.edu.tr (Ugur Halici)

- **10th Israeli Symposium on Artificial Intelligence and Computer Vision** 27-28 Dec 93 Tel-Aviv, Israel *[30 Jun 93]* "Cognitive Modeling; Pattern Recognition and Neural Networks" *Contact:* schild@bimacs.cs.biu.ac.il (Dr. Uri J. Schild)

- **3rd Annual Conference on Evolutionary Programming** (EP94) 24-25 Feb 94 San Diego, CA, USA *30 Jun 93 (abstract)* "Neural network training and Design; Pattern Recognition" *Contact:* pja@cis.ohio-state.EDU (Peter J Angeline)

- **Mini-Conference on Applications and Architectures of Fuzzy Logic and Neural Network Systems** 27 Aug 93 Dartmouth, MA, USA *15 Jul 93 Contact:* CCHEN@U-MASSD.EDU (Professor C. H. Chen)

- **3rd Int'l Symposium on Artificial Intelligence and Mathematics** 2-5 Jan 94 Ft Lauderdale, FL, USA *[30 Jul 93]* "Mathematical methods in neural networks, learning theory, learning algorithms, complexity of neural computation" *Contact:* hoffman@acc.fau.edu (Frederick Hoffman)

- *August/September 1993 Deadlines*

- **1993 Int'l Symposium on Nonlinear Theory and its Applications** 5-9 Dec 93 Waikiki, HI, USA *[15 Aug 93] (summary)* "Neural Networks, Cellular Neural Networks, Biocybernetics" *Contact:*

tanaka@mamoru.ee.sophia.ac.jp (Mamoru Tanaka)

- **Int'l Conference on Expert Systems for Development** 28-31 Mar 94 Bangkok, Thailand *[15 Aug 93] (abstracts)* "Associative Memories, Machine Learning, Neural Networks" *Contact:* sada@cs.ait.ac.th (Dr. R.Sadananda)

- **Workshop on Automatic Speaker Recognition, Identification and Verification** (IDIAP-ESCA Workshop) 5-7 Apr 94 Martigny, Switzerland *[15 Sep 93] Contact:* esca@idiap.ch

- **Asia Pacific Engineering Journal.** Special Issue on Neural Control. *[15 Sept 93]. Contact:* eletansh@nuscc.nus.sg

- **ACM Symposium on Applied Computing** (SAC'94) Track on Fuzzy Logic in Applications 6-8 Mar 94 Phoenix, AZ, USA *[17 Sep 93]* "Applications of Fuzzy Systems to Neural Systems" *Contact:* fathi@ls1.informatik.uni-dortmund.de (Madjid Fathi)

- *December 1993 Deadlines*

- **7th IEEE Symposium on Computer-Based Medical Systems.** (with annual meeting of Society for Computer Applicatoins in Radiology) 14-16 June 94. Winston-Salem NC. *[1 Dec 93] Contact:* carla@relito.medeng.wfu.edu (Carla Muller)

- **IEEE Int'l Conference on Neural Networks** (part of IEEE World Congress on Computational Intelligence) 26 Jun-2 Jul 94 Lake Buena Vista, FL, USA *[15 Dec 93]* Contact: 70750.345@compuserve.com

- **First World Congress on Computational Medicine and Public Health** 24-28 Apr 94 Austin, TX, USA *[1 Nov 93]* "Brain modeling, Neural nets and clinical applications, Neurological disorder modeling" Contact: compmed94@chpc.utexas.edu

- **Int'l Conference on Artificial Neural Networks** (ICANN'94) 26-29 May 94 Sorrento, Italy *[15 Dec 93]* "Cognitive Science, Mathematical Models, Neurobiology,.." *Contact:* iiass@salemo.infn.it (Prof. Eduardo R. Caianiello)

- *1994 Deadlines*

- **From Animals to Animats: 3rd Int'l Conference on Simulation of Adaptive Behavior** (SAB94 8-12 Aug 94 Brighton, UK *[15 Jan 94]* "Neural correlates of behavior; Neural networks and evolutionary computation; Hierarchical and parallel organizations" *Contact:*

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sab94@cogs.susx.ac.uk

- **12th Int'l Conferences on Pattern Recognition** (ICPR) 9-13 Oct 94 Jerusalem, Israel *15 Feb 94* "Pattern recognition and neural networks; parallel computing" *Contact:* icpr@math.tau.ac.il

- **3rd Int'l Conference on Fuzzy Logic, Neural Nets and Soft Computing.** (IIZUKA'94) Iizuka, Fukuoka, Japan. 1-7 August 94. *31 Mar '94 Contact:* FAX 81 948 24 3002 (Takeshi Yamakawa).

- **First IEEE Int'l Conference on Image Processing** (ICIP-94) 13-16 Nov 94 Austin, TX, USA *15 Feb 94 (abstracts)* "Neural Networks for image processing and model-based compression" *Contact:* icip@pine.ece.utexas.edu

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US-ONR Accelerated Research Initiatives

The Office of Naval Research (ONR) announces two new Accelerated Research Initiatives to start funding basic science research in in Fiscal Year 1994, beginning October 1, 1993.

- **Locally Connected Neuromorphic Systems**

The objective of this research program is to develop an understanding of the computational principles emerging from the spatio-temporal dynamics of locally connected neurons and electronic devices. The goal is to develop a new discipline called synthetic neuroscience, i.e., the use of electronics technology to assist in the quantitative understanding of the brain. Biological neural network and system models will be developed based on the idea of local connectivity. Theories will be investigated to analyze the dynamical behavior of systems consisting of locally connected neurons and electronic devices. Locally connected architectures will be implemented in VLSI and ultimately in arrays of quantum effect devices. The possibility of using locally connected nonlinear dynamical systems to understand the behavior of physical systems and to perform simulations of fluid dynamics, finite element analysis, lattice gas models, and image processing will be investigated.

For more information, please contact:
Dr. Clifford Lau (703)696-4961
Theory & VLSI electronics
Dr. Larry Cooper (703) 696-4215
Quantum effect devices
Dr. Joel Davis (703)696-4744
Computational Neuroscience
Dr. Thomas McKenna (703) 696-4503 *Computational Neuroscience*

- **Optimization and Computational Logic**

The objectives of this research program are to develop optimization-based algorithms for large-scale logical inference, to develop and improve software tools for logic programming, and to develop a more complete understanding of soft logics. Both propositional logic and soft logic, such as probabilistic logic, tri-state logic, multivalued logic, and fuzzy logic, will be investigated. Computationally efficient methods and software for solving large-scale inference problems by means of integer programming will be developed. Theories of soft logic information processing will be investigated, such as calculus of soft logic, sensitivity analysis, and methods for determining membership functions. Analytical methods will be developed for quantitatively assessing the
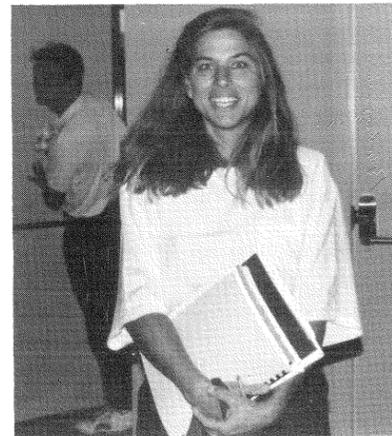
performance of soft logic control systems. Soft logic information processing systems will be applied to the problems of data fusion, control, artificial intelligence, and decision theory.

For more information, please contact:
Dr. Don Wagner (703) 696-4313,
Optimization
Dr. Ralph Wachter, (703)696-4961,
Computers and Software
Dr. Clifford Lau (703)696-4961
Soft logic info. processing

.NNC-IJCNN Student Travel Grants

The AdCom has approved funds for a limited number of travel fellowships for students who are presenting papers at IJCNN93 in Nagoya, Japan, October 25-29 1993. For application information contact:

Karen Haines
Education Committee Chair
2446 Newport Ave.
Cardiff CA 92007
619-436-7314.

Karen Haines

IEEE Neural Networks Council Constituent Societies

Circuits and Systems Society
Communications Society
Computer Society
Control Systems Society
Engineering in Medicine & Biology Soc.
Industrial Electronics Society
Industry Applications Society
Information Theory Society

Lasers and Electro-Optics Society
Oceanic Engineering Society
Power Engineering Society
Robotics and Automation Society
Signal Processing Society
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Awards: Bradley Dickinson, Princeton Univ.

New Journals

•NeuroVe$t Journal

Scheduled to begin publication in September'93, this journal focuses on applying neural networks and emerging technologies to investing and trading in the markets. Charter subscriptions will include 10 years of free stock market data (on disk). Contact Agnes Caldwell, 703-754-0696.

•Int'l Journal of Engineering Intelligent Systems for Electrical Engineering and Communications

The major applications area of this journal are electrical engineering, electric power systems and communications. The Editor in Chief is T. S. Dillon, and the journal will be published quarterly, beginning in May 1993. Contact Editorial Department, CRL Publishing Ltd., PO Box 140, Aldershot Hants UK. *(Ed. note: No phone or FAX numbers, or) email addresses were included.*

NIST Data Base

The National Institute of Standards announces a new database, NIST Special Database 4, which contains 8-bit gray scale fingerprint images. To order, contact Joan Sauerwein, NIST, at 301 975-2208, FAX 301-926 0416. For technical information, contact Craig Watson, 301-975-4402, craig@magi.ncsl.nist.gov.

Announcing a New IEEE Video:

IEEE NEURAL NETWORKS COUNCIL

FUZZY LOGIC and NEURAL NETWORKS: CLIPS FROM THE FIELD
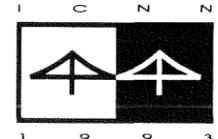
A unique collection of video clips featuring significant applications and developments in the fields of fuzzy logic and neural networks.
These clips include pioneering applications and significant developments in each of these fields and advances resulting from combined application of their methods.

Narrative explanations, describing the nature of underlying techniques, have been incorporated in this volume to further enhance the value of its segments, contributed to the Second IEEE International Conference on Fuzzy Systems (FUZZ-IEEE '93) and to the 1993 IEEE International Conference on Neural Networks (ICNN '93).

NNC-Endorsed Meetings

The Neural Networks Council has agreed to be a "technical co-sponsor" or "cooperating organization" for the meetings listed below.*

Name	Site	Date
WNN'93	San Francisco CA	Nov. 7-10 '93
Intelligent Vehicles'93	Tokyo	July 14-16 '93
ICANN93	Amsterdam	Sept. 13-17 '93
IEEE Wkshop on Neural Networks for Signal Processing	Linthicum MD	Sept. 7-9 '93
ETFA'93: 2nd IEEE Int'l Wkshop on Emerging Technologies for Factory Automation, Design & Operation of Intelligent Factories	Cairns, Australia	Sept 27-29 '93
993 IEEE/Nagoya Univ. WWW on Learning and Adaptive Systems	Nagoya, Japan	Oct. 22-23 '93
1993 IEEE/Nagoya Univ. WWW on Multiple and Distributed Robotic Systems	Nagoya, Japan	Oct. 22-23 '93
Int'l Conf.on Neural Networks & Signal Processing	Guangzhou, China	Nov. 2-5 '93
2nd IEEE Int'l Wkshop on Robots & Human Communication	Tokyo	Nov. 3-5 '93
1993 Int'l Symp. on Nonlinear Theory & its Applications	Hawaii	Dec. 6-9 '93
EP'94: 3rd Evolutionary Programming Conf.	San Diego CA	Feb. 24-25 '94
ICARCV'94: 3rd Int'l Conf on Automation, Robotics & Computer Vision	Singapore	Sept. 13-16 '94

The NNC has agreed to be named in the Call for Papers and other promotional materials for these meetings, but the Council does not have a financial interest. Conference organizers who wish to list the NNC as a cooperating or technical co-sponsor should contact James Bezdek, Chairman of the NNC Meetings Committee for information on the approval process. (email: jbezdek@uwf.bitnet; Tel: (904)474-2784; FAX (904)484-3023.)

IEEE Neural Networks Council
NNC-Sponsored Conferences
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ICNNASP
August 17-20, 1993
Singapore

Virtual Reality Annual International Symposium
September 18-22, 1993
Seattle, Washington

International Joint Conference on Neural Networks
October 25-29, 1993
Nagoya, Japan

World Congress on Computational Intelligence
IEEE International Conference on Neural Networks
FUZZ-IEEE
IEEE International Symposium on Evolutionary Computation
June 26-July2, 1994
Walt Disney World
Orlando Florida

Virtual Reality Annual International Symposium
TBA: September-October 1994
Research Triangle Park, North Carolina

1995 and Beyond...

FUZZ-IEEE (with IFES)
Yokohama Japan, March 1995

ICNN, Perth, Australia, October 1995

ICNN, Washington DC, March 1995

IEEE Neural Networks Council
Dr. Wesley E. Snyder Editor
Bowman Gray School of Medicine

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& ELECTRONICS ENGINEERS, INC.
445 HOES LANE
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