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NAFIPS – another successful year

In this issue:

NAFIPS 1
BSCL: Bien's System Control Lab 2
Who's Who under Forty 3

The year 2004 was very successful for the North American Fuzzy Information Processing Society. The premiere event of the year was the NAFIPS-2004 conference that was held in Banff, AB in June 27-30, 2004. This unique venue, located in the heart of the Rocky Mountains, helped attract participants from all continents. We were fortunate having truly outstanding plenary speakers (L. A. Zadeh, B. Turksen, and K. Hirota) who delivered three inspiring talks. In parallel to the conference, we ran a summer school on Soft Computing and Quantitative Software Engineering. This was a valuable addition to the main event and was of particular interest to graduate students and young researchers. For additional information about NAFIPS-2004, visit http://www.nafips04.ualberta.ca/.

During the conference, the prestigious K.S.Fu award was given to Joe Barone for his long years of research accomplishments and numerous contributions to NAFIPS.

This year NAFIPS 04 attracted a lot of participants: a group photo with the Rockies in the background

Investing in the next generation of fuzzy set researchers is indisputably very high on the agenda of NAFIPS. This was remarkably visible at the conference in Banff where we offered a comprehensive student support program that included free registration packages and accommodation grants. This initiative turned out to be very successful. NAFIPS-2004 was able to attract a large number of students with exceptionally high quality submissions. Students competed for the best paper award. The two-step selection process resulted in the selection of 5 top student papers. Those papers were presented at a special student paper session and were judged by the panel of experts who decided on the finalist (needless to say that the experts did not have an easy job).

The current membership in NAFIPS is over 200 active researchers. Membership in the society, which is currently automatic with the conference registration fee, includes a one-year electronic subscription to the NAFIPS flagship publication, the *International Journal of Approximate Reasoning*. For information about NAFIPS and membership, please visit the NAFIPS website at http://morden.csee.usf.edu/Nafipsf/home.html

The research landscape of fuzzy sets is immensely diversified and this is very much reflected through various ongoing research projects. It is very likely that this trend will continue. Hence the need for education in fuzzy sets becomes even more pressing. Given this, NAFIPS is considering the development of more coherent and carefully planned education activities including tutorials, summer schools, and possible Web-based teaching packages. We are also contemplating forming a comprehensive body of knowledge on fuzzy sets, which would be useful to newcomers to the area and in the design undergraduate and graduate courses of fuzzy sets and soft computing.

The next NAFIPS conference will be in Ann Arbor, Michigan on June 22---25, 2005. This conference will bring a lot of new exciting developments; don't miss the opportunity to attend. Information can be found at http://www.nafips05.wayne.edu/.

Witold Pedrycz: President, NAFIPS

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BSCL-where FUZZY meets intelligent service robotic systems

http://www.ee.kaist.ac.kr/lab/bscl/

Prof. Z. Zenn Bien

BSCL stands for "Bien's System Control Lab." This laboratory was established in August, 1977, when Prof. Bien joined KAIST as an assistant professor in Department of Electrical Engineering. Since its birth and in the years of 1980's, the laboratory has undertaken various research initiatives and projects on control and factory automation to meet the needs of the Korean industry. Some of the early work included the design of an automobile engine control system, the digitalization of power plant control system, and the development of a four legged robot.

Intelligent Sweet Home, KAIST

From the early 90s, Prof. Bien has attempted to fuse AI techniques and fuzzy set theory with human-in-the-loop type automation systems. He soon realized that fuzzy set theory could play a key role when we make machines and robots to interact with humans, or let the engineering system learn and utilize human knowledge. The first notable long-term project was the development of a Korean Sign Language recognition system for the hearing impaired. The laboratory has been conducting the project and its variants (e.g. a hand gesture recognition system) for more than 10 years. In this research, fuzzy techniques in combination with other soft computing techniques have been adopted as major technical component for implementation. With moral as well as financial support from governmental funding agencies, Prof. Bien has been extending his target systems for more general intelligent human-robot interfaces for the elderly and/or the handicapped. Behind the quick successes of various "intelligent" interacting systems developed in BSCL, one may notice that soft computing tools including fuzzy sets, artificial neural nets, genetic algorithms, and rough set theory were utilized by the BSCL research team. Exemplary projects include development of the wheelchair robot, KARES (KAIST Rehabilitation Engineering Service system) to support a physically handicapped person's daily living activities by realizing a human intention, and the development of ISH (Intelligent Sweet Home) where various robotic systems such as bed robots, manipulator robots, mobile robots, and wheelchair and transfer mechanisms support independence for the elderly and handicapped. In addition, Prof. Bien has been focusing his attention on the applications of fuzzy theory in human biosign analysis such as EMG (Electromyogram) signals, facial expressions, footprints, and so on. Due to the characteristics such as inconsistency, complexity, and subjectivity in biosigns, fuzzy set theory can play an important role in the analysis of these human-generated signals. Indeed, various research activities in BSCL headed by Prof. Bien are manifestations of the potential results that can be achieved when fuzzy set theory and the other soft computing techniques meet the intelligent service robots.

Z. Zenn Bien received B.S. degree in electronics engineering from Seoul National University, Korea, in 1969 and the M.S. and Ph.D. degrees in electrical engineering from the University of Iowa, U.S.A., in 1972 and 1975, respectively. Since 1977, he has been with the Dep't of Electrical Engineering and Computer Science at Korea Advanced Institute of Science and Technology (KAIST), where he is currently a Professor. During 1976-1977 academic years, he taught as assistant professor at the Dep't of Electrical Engineering, University of Iowa. Then Dr. Bien joined CASE Center of Syracuse University, New York, and visiting professor at Dep't of Control Engineering, Tokyo Institute of Technology during 1987-1988 academic years. He is the President of IFSA from 2003 and Director of Human-Friendly Welfare Robot System Research Center, KAIST since 1999. Prof. Bien is also the president of Korea Robotics Society. His current research interests include intelligent automation and learning control methods, soft computing techniques with emphasis on fuzzy logic, service robotics and rehabilitation engineering systems. He has published 368 papers in the international technical journals and proceedings along with 10 patents and 12 books authored and edited.

Who's Who under Forty

Information Fusion for Privacy and Decision
http://www.iiia.csic.es/~vtorra

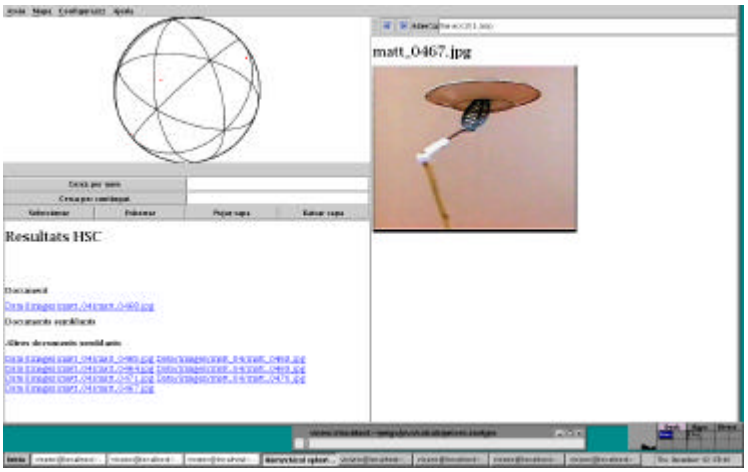
Dr. Vicenç Torra

Dr. Vicenç Torra's research interests are focused on information fusion methods and techniques, in a broad sense, and on their application. Applications have been developed on privacy (*e.g.* privacy preserving data mining) and decision making.

Since receiving his Ph. D. in 1994, Dr. Torra has been working on different aspects related with aggregation operators and mechanisms for integrating data/information that come from different sources. In particular, he has worked on methods of aggregating and analyzing data from numerical and ordinal scales, dendrograms, and partitions; as well as the fusion of data files.

In the numerical setting, Dr. Torra introduced the WOWA (Weighted OWA). This operator takes advantages of both the weighted mean and the OWA operator. Later, he studied Choquet and Sugeno integrals and the use of fuzzy measures for such integrals. He defined some families of fuzzy measures with variable complexity. A property of these measures is that they can be defined with an appropriate complexity so that, for a given problem, the number of parameters to fix is as low as possible. The *m*-dimensional distorted probabilities, defined in a joint work with Dr. Narukawa, are an example of such families. With $m=1$ the measure is a distorted probability (and when used in a Choquet integral, it is equivalent to a WOWA). However, when *m* is the number of data sources, the family is general enough to encompass any arbitrary fuzzy measure. Thus the range *m* corresponds to the range of fuzzy measures. Another problem studied is the construction of models based on aggregation operators for a particular application. One of the approaches is to learn the model from a set of examples. Research has been done for several aggregation operators including the weighted mean, the quasi-arithmetic mean, and the WOWA.

A different kind of fusion problem occurs when data resides on several files. In its most simple formulation, this problem corresponds to the case in which we have two files describing the same individuals using the same attributes. The goal is to link records belonging to the same individuals; the difficulty is the divergence in the data. Dr. Torra has studied the so-called re-identification algorithms (e.g. record linkage) that are used for this purpose. The OWA operator has been proven useful for finding the correct links. Clustering is a useful alternative.



The Gambal system for information retrieval

Privacy issues have emerged as an important topic in recent years. One aspect that concerns some bureaus and offices is that the publication of private data is not allowed unless privacy is assured to data respondents. At the same time, there is an increasing interest from researchers as well as decision makers for accessing such data. Statistical Disclosure Control (SDC) and Privacy Preserving Data Mining (PPDM) are two fields that study methods and techniques for the protection of data. Dr. Torra is studying several aspects related to such privacy issues. In particular, he has studied masking methods (data distortion mechanisms) for both numerical and ordinal data, measures for information loss (to what extent the protection mechanism has perturbed the data and impedes the analysis that the original data) and disclosure risk (to what extent it is possible to discover sensitive information once the masking has been applied). Fuzzy clustering techniques have been applied for masking data (for the so-called microaggregation method), and re-identification algorithms have been used as a measure for disclosure risk.

Other subjects of interest include hierarchical fuzzy systems and information retrieval. In relation to information retrieval, Dr. Torra has developed, in collaboration with Prof. Miyamoto, the GAMBAL system for clustering web pages and images. The system integrates a clustering tool and a visualization system.

Dr. Torra is with (1999-) the Institut d'Investigació en Intel·ligència Artificial (CSIC, Bellaterra, Catalonia, Spain) where he is an Assoc. Prof. (research track), and was with the U. Rovira i Virgili (Assoc. Prof., 1997-1999). He is member of the Ed. Board of Fuzzy Sets and Systems, J. of Privacy Technology, Mathware and Soft Computing; and served as PC Chair of MDAI 2004, MDAI 2005, PSD 2004. He is member of ACIA (board member, 1996-2000), EUSFLAT (board member, 2001-) and IEEE (senior member, 2003).