EUSFLAT
EUROPEAN SOCIETY FOR FUZZY LOGIC AND TECHNOLOGY

NEWSLETTER

European Society for Fuzzy Logic and Technology
Vol.2, No. 1, April 2006

In this Issue:

Editorial

Dear members of the EUSFLAT Society,

Roughly three months have passed since the first EUSFLAT Newsletter (Vol 1, No. 1) has been released. We are very glad that, hereby, we can already present the second newsletter (Vol. 2, No. 1) to you.

In the editorial of the first newsletter, I made statements mainly regarding the society. This time, I would like to make a few personal comments on the topic of our society — fuzzy logic and related technologies — its present and future.

Last year, we celebrated the 40th anniversary of Lotfi Zadeh's seminal paper "Fuzzy Sets". Several conferences and special issues have been organized on this occasion. We have been celebrating the early pioneers and whole community (so ourselves) last year and we are all proudly looking back on a remarkable list of achievements and successes that were accomplished since 1965. Even in the light of all successes and achievements, one should not overlook that our community has changed significantly in the last 15 years since the "big fuzzy hype". On the one hand, a significant proportion of fuzzy technologies (e.g. parts of fuzzy control) have emerged as standard technologies outside the research community. This is good, but entails the demand for new research directions. On the other hand, some expectations remained unfulfilled so far or turned out to be exaggerated. This is somehow bad, but at least it provides ground for further research activities. We have also witnessed that some colleagues have turned away from the topic and we have witnessed a decrease of the visibility of fuzzy logic in public discussion and media. These are natural and normal phenomena after a major hype is over, but — without any discussion — it is harmful to the topic itself. I very well remember a round table discussion at the Joint EUSFLAT-ESTYLF conference in Palma de Mallorca in September 1999. On this occasion, Hans-Jürgen Zimmermann, one of *the* European pioneers in fuzzy logic expressed his concern about a potential decline of the topic and he strongly pleaded for counter-measures. Today I am convinced that he foresaw an important danger at an early stage.

So why am I telling you this? Well, because of two reasons:

(1) I also would like to plead that there is indeed fundamental need for new impulses in research. We have to create new advances that are both scientifically interesting and relevant for non-trivial real-world applications.

(2) For the first time in several years, I have the impression that our community is advancing again. On the one hand, I have enjoyed the last conferences I visited very much. I had the impression that new impulses are being created, that new talents and new ideas are emerging. On the other hand, the establishment of the European Centre for Soft Computing is one of the strongest possible signs for the advance of our community. I am very glad that such an institute could be established and I am convinced that the European research community will benefit very much from this institute. I also want to express my deep appreciation that the former president of EUSFLAT, Luis Magdalena, has been appointed director of ECSC and that our present treasurer, Oscar Cordón, will also be an important member of this institute. I would like to congratulate them and all other new members of ECSC to their new positions and I wish them all the best for a prosperous future of ECSC.

To summarize, in my humble opinion, fuzzy logic is not the subject of a hype that is over, but, on the contrary, it is still (more than ever) a technology of the future. There are fascinating new research ideas and interesting new application domains, e.g., in Internet applications, natural language processing, bioinformatics, medicine, image processing, and many more. I am convinced that there are enormous opportunities ahead of us and I would like to encourage us all to take part. EUSFLAT will try to support the exchange of ideas and will help to provide a fertile ground for the advance of fuzzy logic and related technologies.

I wish you and your families a Happy Easter!

Cordially yours,
Ulrich Bodenhofer
president@eusflat.org

Society briefs:

European Centre for Soft Computing (ECSC)

Past January 17th, the public presentation of the Foundation for the Advancement of Soft Computing took place. The objective of this Foundation is to launch and maintain a research and development centre, the European Centre for Soft Computing (ECSC), which was also presented. The purpose of this new structure is to serve as a world-class institution focused on basic research and applications in the area of Soft Computing.

The Foundation (as well as the Centre) is located in Mieres (Asturias, Spain) and has been promoted by CajAstur (Asturias Savings Bank) with the financial support of CajAstur, the Government of the Principality of Asturias, and the Department of Industry of Spain.

The activities of the ECSC will be guided by a Scientific Committee (SC) composed of:
Senén Barro, Christer Carlsson, María Ángeles Gil (Secretary), Janusz Kacpryk, Rudolf Kruse, Ebrahim Mamdani, Henri Prade, Gianguido G. Rizzotto, Enric Trillas (Vice chairman) and Lotfi A. Zadeh (Chairman).

The ceremony of presentation was chaired by the President of the Principality of Asturias, Mr. Vicente Álvarez Areces, who was assisted by the President of CajAstur, Mr. Manuel Menéndez, the President of the University of Oviedo, Professor Juan Vázquez, the representative of the Trades Union, the Chairman and the vice Chairman of the Scientific Committee, Professors Lotfi Zadeh and Enric Trillas, and the General Director of the European Centre for Soft Computing, Professor Luis Magdalena.

On the occasion of this public presentation, Professor Lotfi A. Zadeh offered the talk: “Information Technology and its impact on Science, Culture and Society”. In addition, a meeting of the Scientific Committee was held at CajAstur premises.

The research structure of the Centre will be based on a number of research labs composed of a Principal Researcher, an Associate Researcher, as well as Postdoc and Graduate Student positions. In addition, some Emeritus Researchers will be appointed. The arrival of the first group of researchers to the Centre has been arranged for the beginning of April.

Link: http://www.fasc.es (will be accessible soon)

Public presentation of the European Centre for Soft Computing

New Online Type-2 Fuzzy Logic Resource

The Centre for Computational Intelligence at De Montfort University, UK has launched an online resource for type-2 fuzzy logic researchers. The site includes news, conferences, a publication list, and other useful information. This is intended to be a site for both those already working in the community and for those who wish to find out more about type-2 fuzzy logic.

Link: http://www.type2fuzzylogic.org/

PhD Dissertations:

Corrado Mencar
Theory of Fuzzy Information Granulation. Contributions to Interpretability Issues

Abstract: Granular Computing is an emerging conceptual and computational paradigm for information processing, which concerns representation and processing of complex information entities called "information granules" arising from processes of data abstraction and knowledge derivation. Within Granular Computing, a prominent position is assumed by the "Theory of Fuzzy Information Granulation" (TFIG) whose centrality is motivated by the ability of representing and processing perception-based granular information. A key aspect of TFIG is the process of data granulation in a form that is interpretable by human users, which is achieved by tagging granules with linguistically meaningful (i.e. metaphorical) labels belonging to natural language. However, the process of interpretable information granulation is not trivial and poses a number of theoretical and computational issues that are subject of study in this thesis.

In the first part of the thesis, interpretability is motivated from several points of view, thus endowing with a robust basis for justifying its study within the TFIG. On the basis of this analysis, the constraint-based approach is recognized as an effective means for characterizing the intuitive notion of interpretability. Interpretability constraints known in literature are hence deeply surveyed with a homogeneous mathematical formalization and critically reviewed from several perspectives encompassing computational, psychological, and linguistic considerations.

In the second part of the thesis some specific issues on interpretability constraints are addressed and novel theoretical contributions are proposed. More specifically, two main results are achieved: the first concerns the quantification of the distinguishability constraint through the possibility measure, while the second regards the formalization of a new measure to quantify information loss when information granules are used to design fuzzy models.

The third part of the thesis is concerned with the development of new algorithms for interpretable information granulation. Such algorithms enable the generation of fuzzy information granules that accurately describe available data and are properly represented both in terms of quantitative and qualitative linguistic labels. These information granules can be used as building blocks for designing neuro-fuzzy models through neural learning. To avoid interpretability loss due to the adaptation process, a new architecture for neuro-fuzzy networks and its learning algorithm are proposed with the specific aim of interpretability protection.

Supervisor: Anna Maria Fanelli

About the author:
Corrado Mencar, born in 1976, studied Informatics at the University of Bari, Italy, and gained his PhD on April 2005. He is currently Assistant Professor at the Department of Informatics, University of Bari, Italy. E-mail: mencar@di.uniba.it

Bibliographic Information:
The thesis is available at: http://www.di.uniba.it/~mencar/phdthesis.htm

Book announcements and reviews:

- H. T. Nguyen, B. Wu, *Fundamentals of Statistics with Fuzzy Data*, Studies in Fuzziness and Soft Computing 198, Springer, 2006. ISBN 3-540-31695-7.
- J. J. Buckley, *Fuzzy Probability and Statistics*, Studies in Fuzziness and Soft Computing 196, Springer, 2006. ISBN 3-540-30841-5.
- I. Glockner, *Fuzzy Quantifiers: A Computational Theory*, Studies in Fuzziness and Soft Computing 193, Springer, 2006. ISBN 3-540-29634-4.
- B. Bouchon-Meunier, G. Coletti, R. Yager, (Eds.), *Modern information processing: From Theory to Applications*, Elsevier, 2006. ISBN 0-444-52075-9.

Book description

B. Bouchon-Meunier, G. Coletti, R. Yager, (Eds),
MODERN INFORMATION PROCESSING: From Theory to Applications
with a Foreword by L. A. Zadeh

Description: The volume "Modern Information Processing: From Theory to Applications," edited by Bernadette Bouchon-Meunier, Giulianella Coletti and Ronald Yager, is a collection of carefully selected papers drawn from the program of IPMU'04, which was held in Perugia, Italy. The book represents the cultural policy of IPMU conference which is not focused on narrow range of methodologies, but on the contrary welcomes all the theories for the management of uncertainty and aggregation of information in intelligent systems, providing a medium for the exchange of ideas between theoreticians and practitioners in these and related areas.

Audience: Researchers oriented to theory and application of methods for handling partial knowledge in intelligent systems. Also for Ph.D. students in mathematics and computer science. Nevertheless, the book is intended for a wider audience ranging from graduate students with proper background in mathematics and/or informatics.

Link: http://www.elsevier.com/inca/707741

Conferences and Call for Papers

Conference reports:

- F S T A 2 0 0 6:

The traditional biannual conference FSTA (Fuzzy Set Theory and Applications) was organized January 30 – February 3, 2006, in Liptovský Ján (Tatra Mountains, Slovakia). Under the auspices of EUSFLAT, the conference was organized by the Faculty of Civil Engineering of Slovak University of Technology in Bratislava, the Academy of Armed Forces in Liptovský Mikuláš and by the Institute of Mathematics of the Slovak Academy of Sciences, Bratislava. The conference was attended by 85 scientists from 11 countries, including the president of EUSFLAT, Ulrich Bodenhofer. Besides interesting invited lectures and contributed talks from fuzzy logic, fuzzy control, fuzzy measures and other related fields, the conference has featured also a minisymposium „Fuzzy approximation“, workshops on basics of fuzzy sets and on copulas, and an open problem session. A traditional highlight of the FSTA conference was the concert of participants held in the M.Benka gallery in Liptovský Mikuláš.

E.P.Klement and R.Mesiar, FSTA 2006 chairmen

Upcoming EUSFLAT-Endorsed Events:

- **8th International Conference on Artificial Intelligence and Soft Computing (ICAISC 2006)**, Zakopane, Poland, June 25-29, 2006.
  http://icaisc.pcz.pl/
- **11th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems (IPMU 2006)**, Paris, France, July 2-7, 2006.
  http://ipmu2006.lip6.fr/
- **6th International Conference on Recent Advances in Soft Computing (RASC 2006)**, Canterbury, UK, July 10-12, 2006.
  http://www.rasc2006.org/
- **2nd International Symposium on Evolving Fuzzy Systems (EFS '06)**, Lake District, UK, September 7-9, 2006.
  http://www.efs06.org/
- **9th Fuzzy Days**, Dortmund, Germany, September 18-20, 2006.
  http://fuzzydays.cs.uni-dortmund.de

- **French Days on Fuzzy Logic and Applications (LFA 2006)**, Toulouse, France, October 19-21, 2006.
  http://www.irit.fr/LFA06/

Other Events:

- **SAC 2006 - Special Track on Information Access and Retrieval (SAC-IAR 2006)**, Dijon, France, April 23-27, 2006.
  http://www.cis.strath.ac.uk/external/SAC2006/
- **7th International Conference on Flexible Query Answering Systems (FQAS 2006)**, Milano, Italy, June 7-10, 2006.
  http://fqas2006.disco.unimib.it/
- **2006 IEEE World Congress on Computational Intelligence**, Vancouver, BC, Canada, July 16-21, 2006.
  http://www.wcci2006.org/
- **2nd SIPTA School on Imprecise Probabilities**, Madrid, Spain, July 24-28, 2006.
  http://bayes.escet.urjc.es/~emiranda/sipta
- **3rd Romanian-Hungarian Joint Symposium on Applied Computational Intelligence (SACI 2006)**, Timisoara, Romania, May 25-26, 2006
  http://www.bmf.hu/conferences/saci2006
- **4th International Conference on Management, Enterprise and Benchmarking (MEB 2006)**, Budapest, Hungary, June 1-2, 2006
  http://www.kgk.bmf.hu/meb
- **15th International Workshop on Robotics in Alpe-Adria-Danube Region (RAAD 2006)**, Balatonfüred, Lake Balaton, Hungary, June 15-17, 2006.
  http://www.bmf.hu/conferences/raad2006
- **10th IEEE International Conference on Intelligent Engineering Systems 2006 (INES 2006)**, London, United Kingdom, June 26-28, 2006.
  http://www.ines-conf.org
- **IEEE International Conference on Mechatronics (ICM 2006)**, Budapest, Hungary, July 3-5, 2006.
  http://www.bmf.hu/conferences/icm2006
- **4th IEEE International Conference on Computational Cybernetics (ICCC 2006)**, Helsinki, Finland and Tallinn, Estonia, August 18-22, 2006.
  http://plectics.org
- **4th Serbian-Hungarian Joint Symposium on Intelligent Systems (SISY 2006)**, Subotica, Serbia and Montenegro, September 29-30, 2006.
  http://www.bmf.hu/conferences/sisy2006
- **7th International Symposium of Hungarian Researchers on Computational Intelligence**, Budapest, Hungary, November 10-11, 2006.
  http://www.bmf.hu/conferences/huci2006
- **3rd IEEE Conference On Intelligent Systems**, London, U.K., September 4-6, 2006. **Submission deadline: December 12, 2005.**
  http://ieeeis06.wmin.ac.uk
- **XIII Spanish Conference on Fuzzy Logic and Technology**, Ciudad Real, Spain, September 20-22, 2006. **Submission deadline: 7 April 2006.**
  http://www.estylf2006.org
- **2nd Int. Conf. on Natural Computation, 3rd Int. Conf. on Fuzzy Systems and Knowledge Discovery (ICNC'06 - FSKD'06)**, Xi'an, China, September 24-28, 2006. **Submission deadline: 15 April 2006.**
  http://www.icnc-fskd2006.org/
- **11 th Online World Conference on Soft Computing in Industrial Applications (WSC11)**, September 18-Oct 6, 2006. **Submission deadline: 1 May 2006.**
  http://www.gtsav.gatech.edu/drl/wsc11/