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Society Briefs

REMINDER: EUSFLAT 2007 Conference,

The preparations for the next EUSFLAT conference that is to be held September 11–14, 2007, in Ostrava, Czech Republic, are in full swing. Around 200 participants are expected to come and to present their latest research advances. An impressive list of world-known invited speakers complements this unique event. Do not miss it! Check out <http://www.eusflat2007.cz/> for more information.



EUSFLAT Awards Students Grants for Three Events in 2007



We are glad to announce that EUSFLAT will award student grants for visits to three different events in 2007. As usual, EUSFLAT awards ten student grants for its biannual [EUSFLAT Conference](#) (Ostrava, Czech Republic, September 11-14, 2007). Additionally, five grants will be available for the [4th International Summer School on Aggregation Operators](#) (Ghent, Belgium, July 9-14, 2007) and three grants are planned for [1st Summer Course on Future Directions in Soft Computing](#) (Mieres, Spain, July 9-13, 2007). Student members of EUSFLAT are kindly invited to use these unique opportunities. Please have a look at the homepages of these events and the [EUSFLAT Student Grants Page](#) for more information.

News Concerning Working Groups

- (1) New websites for the EUSFLAT working groups were put on-line during March 2007.
- (2) The [Learning and Data Mining Working Group](#) now has a third coordinator, [Plamen Angelov](#) (Univ. of Lancaster, UK)
- (3) New working groups are planned to be established before summer 2007.

Check out <http://www.eusflat.org/research/wgroups.htm> for more information.

CajAstur International Prize for Soft Computing



CajAstur and the Foundation for the Advancement of Soft Computing announce the *CajAstur International Prize for Soft Computing* meant to distinguish a person or group of persons for the realization of a relevant scientific or industrial application, meaning an original contribution in the area of Soft Computing.

The contribution (realized by a person or group) can be related to Theory or Actual Applications of Soft Computing and should not be more than ten years old.

The Prize consists of € 20,000.00 and an Award Certificate. The prize winner (or the representative in case of a group) will be invited to travel to Oviedo, Spain to personally receive the Award. The prize winner commits herself/himself to attend the awarding ceremony, to deliver a specialized talk at the European Centre for Soft Computing as well as a talk open to the general public in Asturias.

The Jury of the prize will be the Scientific Committee of the Foundation for the advancement of Soft Computing.

Deadline for submitting applications for the 2007 Prize is June 15th 2007.

For additional information, see <http://www.softcomputing.es/en/detailnew.php?cod=149>

Society Briefs (cont'd)

Future Directions in Soft Computing - First Summer Course

The first summer course on Future Directions in Soft Computing will take place in Mieres, Asturias, Spain, July 9–13, 2007, and is organized by the [European Centre for Soft Computing](#).

The summer course reviews the fundamentals of Soft Computing, describes many real-world applications, and, in particular, treats new trends and future directions of the field. Participants will gain insight into the potential of soft computing techniques and the state of the art in the area. To achieve this, the lecturers have been selected from the leaders of the different branches of Soft Computing.

The course will cover the following topics:

- Fundamentals and New Trends on Fuzzy Set Theory - Fuzzy Systems
- Fundamentals and New Trends on Evolutionary Computation
- Fundamentals and New Trends on Neural Networks
- Computing with Words and Linguistic Data Mining
- Fusion of Soft Computing Tools
- Applications of Soft Computing

Lecturers will be

- Piero Bonissone (General Electric R&D)
- Christian Borgelt (ECSC)
- Oscar Cordón (ECSC)
- Francisco Herrera (University of Granada)
- Bob John (Monfort University)
- Janusz Kacprzyk (Polish Academy of Sciences)
- Frank Klawonn (University of Applied Sciences Braunschweig/Wolfenbüttel)
- Rudolph Kruse (University of Magdeburg)
- Pedro Larrañaga (University of the Basque Country)
- Claudio Moraga (ECSC)
- Enric Trillas (ECSC)

For additional information visit the web page <http://www.softcomputing.es/summercourse/>

PhD Dissertations

Enric Hernández Jiménez

Uncertainty and Indistinguishability. Application to Modelling with Words.

Abstract: The concept of equality is a fundamental notion in any theory since it is essential to the ability of discerning the objects to whom it concerns, ability which in turn is a requirement for any classification mechanism that might be defined.

The standard way of approaching the concept of identity is linked to a tradition that can be traced back in time. For instance, Leibniz's Law of Identity is intended to express the concept of identity as agreement with respect to all properties. When all the properties involved are entirely precise, what we obtain is the classical equality where two individuals are considered equal if and only if they share the same set of properties. What happens, however, when imprecision arises as in the case of properties which are fulfilled only up to a degree? Then, because certain individuals will be more similar than others, the need for a gradual notion of equality arises.

These considerations show that certain contexts that are pervaded with uncertainty require a more flexible concept of equality that goes beyond the rigidity of the classic concept of equality. T-indistinguishability operators seem to be good candidates for this more flexible and general version of the concept of equality that we are searching for.

On the other hand, Dempster-Shafer Theory of Evidence, as a framework for representing and managing general evidences, implicitly conveys the notion of indistinguishability between the elements of the domain of discourse based on their relative compatibility with the evidence at hand. In chapter two we are concerned with providing definitions for the T-indistinguishability operator associated to a given body of evidence.

In chapter three, after providing a comprehensive summary of the state of the art on measures of uncertainty, we tackle the problem of computing entropy when an indistinguishability relation has been defined over the elements of the domain. Entropy should then be measured not according to the occurrence of different events, but according to the variability perceived by an observer equipped with indistinguishability abilities as defined by the indistinguishability relation considered. This idea naturally leads to the introduction of the concept of observational entropy.

Real data is often pervaded with uncertainty so that devising techniques intended to induce knowledge in the presence of uncertainty seems entirely advisable. The paradigm of computing with words follows this line in order to provide a computation formalism based on linguistic labels in contrast to traditional numerical-based methods. The use of linguistic labels enriches the understandability of the representation language, although it also requires adapting the classical inductive learning procedures to cope with such labels.

In chapter four, a novel approach to building decision trees is introduced, addressing the case when uncertainty arises as a consequence of considering a more realistic setting in which decision maker's discernment abilities are taken into account when computing node's impurity measures. This novel paradigm results in what have been called "observational decision trees" since the main idea stems from the notion of observational entropy in order to incorporate indistinguishability concerns. In addition, we present an algorithm intended to induce linguistic rules from data by properly managing the uncertainty present either in the set of describing labels or in the data itself. A formal comparison with standard algorithms is also provided.

Keywords: Uncertainty measures, Dempster-Shafer Theory of Evidence, Indistinguishability Operators, Decision Trees, Machine Learning, Cooperative Game Theory.

Advisors: Jordi Recasens, Universitat Politècnica de Catalunya.

About the author: Enric Hernández, born in 1970 (Barcelona, Spain), studied Computer Science Engineering at the Universitat Politècnica de Catalunya (UPC). He was awarded his PhD degree in January 2007 by the Universitat Politècnica de Catalunya. He works as manager of the Public Key Infrastructure (PKI) of the Spanish Notarial Certification Agency (ANCERT). Since 1996 he enjoys playing serious Scrabble (crossword game) in Spanish. Currently, he is the World Champion after winning the 10th World Championship in Montevideo, Uruguay (December, 2006). E-mail: enriche@lsi.upc.edu.

Bibliographic Information: The thesis is available at: http://www.lsi.upc.edu/~enriche/docs/tesi_doctorand_enric_hernandez_46049633E.pdf

Pilar Bulacio

System of heterogeneous classifiers for joint decision making based on information aggregation by fuzzy integrals

Abstract: Collective classification looks for the accuracy and robustness improvement. The diversity on classifiers knowledge may provide different error patterns. This observation suggests that multiple classifiers can enhance the accuracy of any single one. It is clear that the efficacy of multiclassification depends on the ability of the decision combination method to avoid the transference of individual mistakes to collective results.

The design of systems of collective classification usually involves two steps: the generation of classifiers, and the combination of them. In general, the first step creates a set of effective classifiers taking into account the later combination. However, the set of classifiers may be given and just the combination stage can be controlled. A typical example of this situation is when an only decision-making is required from a population of classifiers, even huge, which were not adapted to a collective work.

This thesis is devoted to the study of efficient design of collective classification systems, starting from a dynamic and given set of heterogeneous classifiers, which cannot be modified towards their effective combination. With this aim, the first part of the thesis studies the strength and constraints of paradigms of collective classifications to determine their adaptability to a general set of classifiers. On the basis of this analysis, the fuzzy integrals are suggested. The main reason is their possibility to work with both generalist and specialist classifiers, as well as their wide collective behavior description through fuzzy measures. In the second part of the thesis diverse forms of individual and collective behavior characterization are addressed. Regarding the efficiency of the combination knowledge induction, a rough combination may imply high complexity. Under this baseline, a selection-combination strategy is proposed. Consequently, the whole process of classifiers combination is separated into two trained and complementary processes: the classifiers selection, to discover a subset of cooperative classifiers under FI, and the typical FI combination of selected classifiers. The proposed selection performs a systematic search of cooperative classifiers subsets by means of a greedy algorithm which through a heuristic allows an efficient exploration of given classifiers.

Advisors: Luis Magdalena Layos, Universidad Politécnica de Madrid and European Centre for Soft Computing.

About the author: Pilar Bulacio was born in Rosario, Argentine in 1972. She obtained a degree in Electronic Engineering in 1998 at the Universidad Nacional de Rosario, Argentine. Since 2002, after her passing through the private company, she has been a research fellow at the Departamento de Matemática Aplicada of the Universidad Politécnica working on her doctoral dissertation, and obtaining her PhD on December 2006. E-Mail: pb@eie.fceia.unr.edu.ar.

Bibliographic Information: The thesis is available at: http://new.ifir.edu.ar/grupos/sistemas-inteligentes/multiclassifiers/tesis/TesisPilar_Bulacio.pdf

Saskia Janssens

Bell Inequalities in Cardinality-based Similarity Measurement

Abstract: A parametric family of cardinality-based similarity measures for ordinary sets, harboring numerous well-known similarity measures, is introduced. The Łukasiewicz- and product-transitive members of this family are characterized. Their importance is due to the one-to-one correspondence with (pseudo-)metrics. Fuzzification schemes based on a commutative quasi-copula are then used to transform these measures into similarity measures for fuzzy sets, rendering them applicable on graded feature set representations of objects. One of the core results is that the mentioned transitivity is preserved along this fuzzification process. It is remarkable that one stumbles across the Bell inequalities when checking these transitivity properties. All Bell-type inequalities regarding at most four random events, of which not more than two are intersected at the same time, are presented and are reformulated in the context of fuzzy scalar cardinalities leading to related inequalities on commutative conjunctors. Some of these inequalities are fulfilled for commutative (quasi-)copulas. Meta-theorems, stating general conditions ensuring that certain inequalities for cardinalities of ordinary sets are preserved under fuzzification are presented. The conditions pertain to a commutative conjunctor used for modelling fuzzy set intersection. In particular, this conjunctor should fulfill a number of Bell-type inequalities. The advantage of these meta-theorems is that repetitious calculations, such as the verification of transitivity, can now be avoided.

Advisors: Prof. Bernard De Baets and Prof. Hans De Meyer, Ghent University, Gent, Belgium

Bibliographic Information: The results of the thesis have been published in several articles:

- [1] S. Janssens, B. De Baets and H. De Meyer. Bell-type inequalities for parametric families of triangular norms. *Kybernetika* 40 (2004), 89–106.
- [2] S. Janssens, B. De Baets and H. De Meyer. Bell-type inequalities for quasi-copulas. *Fuzzy Sets and Systems* 148 (2004), 263–278.
- [3] B. De Baets, S. Janssens and H. De Meyer. Meta-theorems on inequalities for scalar fuzzy set cardinalities. *Fuzzy Sets and Systems* 157 (2006), 1463–1476.
- [4] B. De Baets, S. Janssens and H. De Meyer. On the transitivity of a parametric family of cardinality-based similarity measures. Submitted to *Internat. J. Approximate Reasoning*.

Labs and Research

'Kappalab', a GNU R package for capacities and non-additive integral manipulation

Michel Grabisch, Ivan Kojadinovic and Patrick Meyer

Université de Paris I, France; Ecole polytechnique de l'Université de Nantes, France; University of Luxembourg, Luxembourg

The use of capacities (or fuzzy measures) and non-additive integrals in Multiple Criteria Decision Aiding (MCDA) is not anecdotal anymore. The use of the Choquet integral for instance as an aggregation function is now commonly accepted among many MCDA researchers. It appears therefore more and more necessary to have tools which enable an easy manipulation of capacities and related integrals. The Kappalab package for the GNU R statistical system is an answer to this shortage. It provides a set of high-level routines for the manipulation of capacities and associated non-additive integrals on a finite setting. In particular, it can be useful in MCDA when it comes to the development of new methods or simply to the use of existing capacities identification procedures. The Kappalab package contains several routines for handling various types of set functions such as games or capacities. It can be used to compute non-additive integrals such as the Choquet integral or the Sugeno integral. The analysis of capacities in terms of decision behavior can be performed through the computation of various numerical indices such as the Shapley value, the interaction index, the orness degree, etc. The well-known Möbius transform, as well as other equivalent representations of set functions can also be computed. Furthermore, Kappalab contains seven routines for the identification of capacities from (preferential) data: four least squares based approaches, two maximum entropy-like methods and an unsupervised approach grounded on parametric entropies. The six first methods are of particular interest for MCDA.

What is R? GNU R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS. It includes a suite of operators for calculations on matrices, a large, coherent, integrated collection of intermediate tools for data analysis and graphical display, and especially a well-developed, simple and effective high-level programming language. Roughly speaking, one can think of GNU R as a free, Matlab-like software for statistical analysis grounded on an effective high-level language.

Using Kappalab. Kappalab being a package for GNU R, it follows that before being able to use it, a basic knowledge of the R language is necessary. Let us consider a simple example showing how Kappalab can be used for capacity manipulation. Note that we hereafter assume that the reader is familiar with the basic concepts arising from the use of non-additive measures and integrals in the framework of multicriteria decision making and cooperative game theory. One may also download the numerous articles available from the Kappalab web page.

Let us first define a capacity for a fictitious problem with 3 criteria:

```
> mu <- capacity(c(0, 0.07, 0.15, 0.23, 0.28, 0.48, 0.56, 1))
```

This capacity can then be visualized:

```
> mu
{}      0.00  {2}      0.15  {12}     0.28  {23}     0.56
{1}     0.07  {3}     0.23  {13}     0.48  {123}    1.00
```

The Shapley value of the capacity can be computed:

```
> Shapley.value(mu)
0.2333 0.3133 0.4533
```

The Möbius transform of the capacity can be easily obtained:

```
> m <- Mobius(mu)
```

And then visualized:

```
> m
{}      0.00  {2}      0.15  {12}     0.06  {23}     0.18
{1}     0.07  {3}     0.23  {13}     0.18  {123}    0.13
```

Finally, given a vector of partial evaluations, one can compute its Choquet integral with respect to the capacity:

```
> x <- c(0.1, 0.2, 0.8)
> Choquet.integral(mu, x)
0.294
```

Alternatively, the Möbius transform of the capacity can be used:

```
> Choquet.integral(m, x)
0.294
```

There are more than 40 high-level functions in Kappalab. These can be mainly grouped into two categories: functions for capacity manipulation and functions for capacity identification from (preferential) data. For instance, in the framework of MCDA, a natural way of using Kappalab would be first to use a function from the latter group to identify a capacity and then, functions from the former group to analyze the capacity and the related integral in terms of decision behavior. The package can be downloaded from its web page: <http://www.polytech.univ-nantes.fr/kappalab> or from the Comprehensive R Archive Network: <http://cran.r-project.org>.

A small MCDA example. We consider a simple example to illustrate how Kappalab can be used in the framework of Choquet integral based MCDA. Four cooks a, b, c, and d are evaluated according to their ability to prepare three dishes: frogs' legs (FL), steak tartare (ST) and stuffed clams (SC). Their evaluations on a [0,20] scale are given hereafter:

cooks	FL	ST	SC	cooks	FL	ST	SC
a	18	15	19	c	15	18	11
b	15	18	19	d	18	15	11

The decision maker adopts the following reasoning: when a cook is renowned for his stuffed clams, it is preferable that he/she is also better in cooking frogs' legs than steak tartare, which implies that a is preferred to b. However, when a cook badly prepares stuffed clams, it is more important that he/she is better in preparing steak tartare than frogs' legs, which leads to c is preferred to d. Of course, we also immediately have that a is preferred to d and b is preferred to c. Nevertheless these preferences do not contribute to anything since they naturally follow from the monotonicity of the Choquet integral. It can be easily checked that the above preferences do not satisfy mutual preferential independence. Hence, there is no additive model that can represent them. Using Kappalab and the above preferential information, it is for instance possible to obtain the "least specific" capacity such that the Choquet integral with respect to this capacity numerically represents the decision maker's preferences.

Define four vectors representing the profiles of the cooks:

```
> a <- c(18, 15, 19)      > c <- c(15, 18, 11)
> b <- c(15, 18, 19)      > d <- c(18, 15, 11)
```

Indicate that if an alternative is preferred to another, then their difference in terms of global evaluation should be at least equal to one:

```
> delta.C <- 1
```

Encode the preferential information "a is preferred to b" and "c is preferred to d" in an R matrix:

```
> Acp <- rbind(c(a, b, delta.C), c(c, d, delta.C))
```

Use a maximum entropy like method to determine the “least specific” capacity compatible with the provided preferential information:

```
> s <- mini.var.capa.ident(3, 3, A.Choquet.preorder = Acp)
```

Display the solution:

```
> mu <- zeta(s$solution)
```

```
{}      0.00      {2}      0.50      {12}      0.67      {23}      0.50
{1}      0.17      {3}      0.34      {13}      0.84      {123}     1.00
```

And compute the global evaluations of the cooks:

```
> Choquet.integral(mu, a) > Choquet.integral(mu, b) > Choquet.integral(mu, c) > Choquet.integral(mu, d)
17.83334      16.83334      15.16666      14.16666
```

They are in accordance with the decision maker's preferences.

This short example illustrates how Kappalab can be used in the framework of Choquet integral based MCDA.

Book Announcements



J. Lu, D. Ruan, G. Zhang,
E-Service Intelligence -- Methodologies, Technologies and Applications, Springer, 2007. 711 pages, ISBN-10: 3-540-37015-3; ISBN-13: 978-3-540-37015-4.

Link: <http://www.springer.com/east/home/engineering?SGWID=5-175-69-173623546-0>

Description: E-Service Intelligence integrates intelligent techniques into e-service systems for realizing intelligent Internet information searching, presentation, provision, recommendation, online system design, implementation, and assessment to internet users.

This book offers a thorough introduction and systematic overview of the new field and covers the state-of-the-art of the research and development in E-Service Intelligence ranging from e-services and/or intelligent techniques to web information presentation, search, and mining, to personalization, privacy, and trust in e-services, to e-service evaluation, optimization and knowledge discovery, and to intelligent e-service system developments. This book is written for researchers, engineers, computer scientists, and graduate students in Computational Intelligence.

Brief announcements

- C. Alsina, M. J. Frank, B. Schweizer, B., *Associative functions: triangular norms and copulas*, WorldScientific, 2006. 252 pages. ISBN 981-256-671-6.
<http://www.worldscibooks.com/mathematics/6036.html>
- E. Sanchez, (Ed.), *Fuzzy Logic and the Semantic Web*, Elsevier, 2006. 496 pages. ISBN: 0-444-51948-3.
http://www.elsevier.com/wps/product/cws_home/706920
- E. Herrera-Viedma, G. Pasi, F. Crestani, (Eds.), *Soft Computing in Web Information Retrieval - Models and Applications*, Series: Studies in Fuzziness and Soft Computing 197, Springer, 2006. ISBN 3-540-31588-8.
<http://www.springer.com/west/home/engineering?SGWID=4-175-22-120133316-0>
- M. Sato-Ilic, L. C. Jain, *Innovations in Fuzzy Clustering*, Series: Studies in Fuzziness and Soft Computing 205, Springer, 2006. 152 pages, ISBN 3-540-34356-3
<http://www.springer.com/west/home/engineering?SGWID=4-175-22-170209126-0>
- S. Kendal, M. Creen, *An Introduction to Knowledge Engineering*, 2006. 290 pages. ISBN 1-84628-475-9.
<http://www.springer.com/west/home/computer/artificial?SGWID=4-147-22-165247224-0>
- A. Gegov, *Complexity Management in Fuzzy Systems*, Series: Studies in Fuzziness and Soft Computing, Springer 211, 2007. 351 pages, ISBN 3-540-38883-4.
<http://www.springer.com/west/home/default?SGWID=4-40356-22-173676527-0>
- V. Torra, Y. Narukawa, *Modeling Decisions: Information Fusion and Aggregation Operators*, Springer, 2007. 240 pages, ISBN 3-540-68789-0.
<http://www.springer.com/3-540-68789-0>

Conferences and Calls for Papers

Conference reports

Linz Seminar on Fuzzy Set Theory (<http://www.fill.uni-linz.ac.at/research/linz2007>)

The 28th Linz Seminar on Fuzzy Set Theory „Fuzzy Sets, Probability, and Statistics – Gaps and Bridges“ was held in Linz February 6–10, 2007. It was co-chaired by D. Dubois, IRIT Toulouse, and R. Mesiar, STU Bratislava, and organized by E. P. Klement, JKU Linz.



This year the seminar was devoted to various aspects of probability and fuzziness. Six invited speakers (A. Colubi, University of Oviedo, G. De Cooman, Ghent University, P. Hájek, CS CAS Prague, J. Lawry, University of Bristol, C. Sempì, Università del Salento, Lecce, and L. Utkin, State Forest Technical Academy St. Petersburg) presented state-of-the-art overviews in fuzzy random variables, possibility theory, fuzzy logics of „probably“, label semantics, copulas and imprecise inference models.

In 29 contributed talks, the speakers have presented several fresh ideas and recent results. The official program was accompanied by numerous fruitful discussions among the 46 participants – these discussions are a trademark of the inspirative atmosphere of the Linz Seminars.

The 29th Linz Seminar, focusing on foundations of lattice-valued mathematics and its applications to algebra and topology, will be co-chaired by S. E. Rodabaugh (Youngstown State University, OH) and L. N. Stout (Illinois Wesleyan University, Bloomington, IL), and it is scheduled to take place February 12–16, 2008.

D. Dubois and R. Mesiar, co-chairmen of 28th Linz Seminar.

Upcoming EUSFLAT Conference:

- 5th Conference of the European Society for Fuzzy Logic and Technology (EUSFLAT 2007), Ostrava, Czech Republic, September 11-14, 2007.
<http://www.eusflat2007.cz>

Upcoming EUSFLAT-Endorsed Events:

- 12th IFSA World Congress (IFSA 2007), Cancun, Mexico, June 18-21, 2007.
<http://www.hafsamx.org/ifs2007/>
- 1st Summer Course on Future Directions in Soft Computing, Mieres, Spain, July 9-13, 2007.
<http://www.softcomputing.es/en/summercourse.php>
- 4th International Summer School on Aggregation Operators (AGOP 2007), Ghent, Belgium, July 9-14, 2007.
<http://www.agop2007.ugent.be/>
- Modeling Decisions for Artificial Intelligence (MDAI 2007), Kitakyushu, Japan, August 16-18, 2007.
<http://www.mdai.cat/mdai2007/>
- 2nd International Symposium Advances in Artificial Intelligence and Applications (AAIA'07), Wilsa, Poland, October 15-17, 2007.
<http://www.imcsit.org/?cont=6&type=page&page=5>
- French Days on Fuzzy Logic and Applications (LFA 2007), Nîmes, France, November 22-23, 2007.
<http://www.lfa2007.ema.fr/>

Other Events:

- 2nd International Work-Conference on the Interplay between Natural and Artificial Computation (IWINAC 2007), La Manga, Murcia, Spain, June 18-21, 2007.
<http://www.iwinac.uned.es/>
- IEEE International Conference on Fuzzy Systems, London, UK, July 23-26, 2007.
<http://www.fuzzIEEE07.org>
- Workshop on Uncertainty and fuzziness in case-based reasoning, as part of the ICCBR 2007, Belfast, Northern Ireland, August 15, 2007. Deadline: April 30, 2007.
<http://www.mathematik.uni-marburg.de/~eyke/UFCBR07.html>
- 3rd IFAC Workshop on Advanced Fuzzy and Neural Control, Valenciennes, France, October 29-30, 2007.
<http://www.univ-valenciennes.fr/congres/afnc07/>

Call for papers

Workshop on Uncertainty and fuzziness in case-based reasoning, as part of the ICCBR 2007, Belfast, Northern Ireland, August 15, 2007. Deadline: April 30, 2007.

As a general problem solving methodology intended to cover a wide range of real-world applications, case-based reasoning must face the challenge to deal with uncertain, incomplete, and vague information. Correspondingly, recent years have witnessed an increased interest in formalizing parts of the CBR methodology within different frameworks of reasoning under uncertainty, and in building hybrid approaches by combining CBR with methods of uncertain and approximate reasoning. Fuzzy set theory can be mentioned as a particular though especially interesting example. In fact, even though both CBR and fuzzy systems are intended as cognitively more plausible approaches to reasoning and problem solving, the two corresponding fields have emphasized different aspects that can complement each other in a reasonable way. In particular, rule-based fuzzy systems and CBR systems can cross-fertilize each other in various ways. Besides, fuzzy methods turned out to be very useful for knowledge representation in CBR.

The objective of the workshop is to provide an opportunity for exchanging ideas related to the application of uncertainty techniques in case-based reasoning. The workshop aims at providing a forum for the discussion of recent advances in this research field and to offer an opportunity for researchers and practitioners to identify new promising research directions.

The organizers welcome contributions on the use of principled methods for reasoning under uncertainty such as, e.g., probabilistic and Bayesian methods, fuzzy sets and fuzzy logic, possibility theory, evidence theory, rough set theory, information theory, in case-based reasoning, including but not limited to case and knowledge representation, acquisition, and modeling, maintenance and management of CBR systems, case indexing and retrieval, similarity assessment and adaptation, instance-based and case-based learning, CBR applications.

We encourage submissions of papers that report on advances in these core areas, as well as those dealing with insights or important open problems for future research derived from the construction and use of applications.

<http://www.mathematik.uni-marburg.de/~eyke/UFCBR07.html>

3rd IFAC Workshop on Advanced Fuzzy and Neural Control, Valenciennes, France, October 29-30, 2007.

Previous Workshops were held in Valencia, Spain (2001), and in Oulu, Finland (2004). The workshop is sponsored by three IFAC Technical Committees: Main-Sponsor: TC 3.2 "Cognition and Control", chair: R. Babuska and co-sponsored by the IFAC TC 4.2 "Mechatronic Systems", chair: M. Tomizuka and the 7.1 "Automotive Control" Chair: G. Gissinger.

<http://www.univ-valenciennes.fr/congres/afnc07/>

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