

REPORT ABOUT ACAI'99

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ACAI'99 was held in Chania (Greece) between 5 and 16 July. ACAI'99, thought as an advanced course & school in Machine Learning, was a good place for Ph.D. students in the area of Machine Learning or some reasons. This could be briefly a set of reasons:

- To meet other Ph.D. students in the area of Machine Learning.
- To meet well known and representative researchers in Machine Learning and discuss and comment with them the principal ways of our Ph.D. degree project.
- To view the last set of applications in Machine Learning in the Workshop of the course.
- To attend the plenary talks of well known Machine Learning researchers to view the main topics and general ideas of Machine Learning.

ACAI'99 was divided in different plenary talks given by well known Machine Learning researchers and in a set of different Workshops which presented a high number of recent applications in Machine Learning. There was also a Student Session, specifically oriented for students.

Plenary talks were a good place to review a large amount of Machine Learning topics. The speakers, researchers with a large and successful experience in Machine Learning, were able to give as a global view of Machine Learning. Using this global perspective presented by well known researchers, the students we were able to locate our work or ideas in the wide field of Machine Learning. Having this location in mind, a large amount of ideas which could be used in Ph.D. projects were also presented by these speakers.

Plenary talks were also a good place to enlarge our perspective of Machine Learning. As students, we are normally in our first years in Machine Learning and we work in a specific area or topic of Machine Learning. We have normally read only Machine Learning articles related with our specific area, and probably few articles of other topics. For example, if you only work with decision trees and supervised classification, plenary talks were a good place to listen ideas about other different areas of Machine Learning such as Bayesian networks, clustering, probability distributions and so on. In this way we could capture ideas of these different areas to use them in our specific research area to make hybrid methods or applications.

In these plenary talks, many references and relations were also found to other scientific areas, such as classical Statistic. These pointers had a high interest for Ph.D. students, relating the historical relations between classical Statistic and Machine Learning. The students we are not normally able to have this historical perspective, and it was very interesting to discuss about the roots of Machine Learning and its relation respect the classical Statistic, its advantages and disadvantages.

In plenary talks we could see a large amount of well known Machine Learning and Data Mining tools. In this way, we could think about their advantages and disadvantages to use them in our studies or applications.

Thus, plenary talks were a good basis to understand and locate the papers presented in the Workshops of ACAI'99. Using the high level abstraction ideas of the plenary talks we were able to locate the specific applications of these Workshops. The papers of the Workshop were normally related to real applications. We were able to see that Machine Learning can be applied to a large amount of different areas to solve problems that appear in the real life.

Respect my specific research interests, the most interesting talk was J. Shapiro's one about Genetic Algorithms. Near my research interest were also I. Bratko, T. Mitchell and M. Van Someren talks. In the afternoon, I found very interesting the following Workshops, very near from my research interest or experience:

- Pre- and post- processing in machine learning and data mining: theoretical aspects and applications.
- Data mining in economics, marketing and finance.
- Machine learning in medical applications.

In the other hand, Student Sessions were a good place to have an idea about different Ph.D. projects and intentions. Different ideas, which are the basis for different Ph.D. projects, were presented. This kind of sessions are useful for students like me, with few experience presenting papers in a talk, for growing in our experience and skills to present papers to other persons.

Respect my research interests, I can mark the following points, which are the basis of my Ph.D. project:

- Feature Subset Selection for Machine Learning algorithms using the E.D.A. approach ('Estimation of Distribution Algorithms').
- Feature Weighting for Nearest Neighbour approach using the E.D.A. approach.
- Represent the joint behaviour of Machine Learning algorithms using Bayesian networks.
- Reduce the time requirements of Machine Learning algorithms using unsupervised classification without damaging significantly the classification accuracy.

Basically, I try to use techniques and ideas different to supervised classification to deal with common problems which appear in the supervised classification.

I had two interesting conversations with J. Shapiro, M. Van Someren and T. Mitchell professors about some of these research topics. The paper I presented in the Student Session dealt with the second topic I propose ('Feature Weighting for Nearest Neighbour approach using the E.D.A. approach') and it uses a technique so close to Genetic Algorithms in a Combinatorial Optimization problem, but avoiding the crossover and mutation operators implicit to Genetic Algorithms. Based on this idea, the conversation with Professor J. Shapiro was so fruitful.

In his plenary talk, Professor M. Van Someren proposed to use unsupervised classification techniques to reduce time requirements in supervised classification. In

this way, the conversation with Professor M. Van Someren was so fruitful to exchange ideas.

Otherwise, the conversation with Professor T. Mitchell was involved in the use of Bayesian networks. In my research group large works have been carried out in Bayesian networks, and I am trying to apply them in the topic of supervised classification.

Using these techniques, the last publications of our group try to solve medical problems and were presented during June'99 in Aalborg in the 'Joint European Conference on Artificial Intelligence and Medical Decision Making'. In this way, I maintained interesting conversations with some speakers of 'Machine Learning in medical application' Workshop (E. Alexopoulos or I. Zelic, for example) about real and hard problems that appear in the research with medical applications such as noisy data, small amount of examples and so on.

It is a curious that I met spanish young researchers in ACAI'99 that I did not know. With this curiosity I like to remark the relevance of this type of schools to meet and know people which similar research interests.

I make my research into the 'Intelligent System Group' of the Computer Sciences and Artificial Intelligence Department of the University of the Basque Country. Thus, to see our projects and publications the web page of our group can be visited:

<http://www.sc.ehu.es/isg>

My personal web page can be also found into this web server.