

”Cum grano salis”

by

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Abstract: This short note is devoted to presentation of the essential points in the history of collaboration between the present-day Department of Computer Science and Artificial Intelligence of the University of Granada and the Systems Research Institute, Polish Academy of Science, with special emphasis on the place, taken in this collaboration by *Control and Cybernetics*. Thus, I mention encounters, conference meetings, jointly undertaken projects, as well as certain selected publications. In doing this, I also try to delineate the substance matter of the collaboration, which formed the backbone of it.

Keywords: *Control and Cybernetics*, collaboration, Spain, Poland

How it all started

My first words can only be of thanks to Zbigniew Nahorski and Jan W. Owsinski for the invitation to participate in this 50th anniversary of the first published issue of *Control and Cybernetics*. In accordance with their suggestions for the preparation of this short note, in what follows I will relate a ”Cum grano salis” history on the relationships between the Systems Research Institute of the Polish Academy of Sciences (SRI-PAS) and the Department of Computer Science and Artificial Intelligence of the University of Granada (DECSAI-UGR), because of *Control and Cybernetics*, a history that dates back to 1984 and that we are still writing today.

It all started in 1983, when I received an invitation from Janusz Kacprzyk, with whom I had an intensive postal correspondence (the main and almost the only form of scientific exchange at that time), but whom I did not know personally. Janusz was inviting me to participate in a Special Issue of *Control*

and *Cybernetics* on decision making and optimization, in which he was the Guest Editor.

From my point of view, that 1984 paper (Verdegay, 1984), the first to be published by a Spanish author in *Control and Cybernetics*, and of which I am the sole author, is what we could call the birth certificate of the solid, close and fruitful collaboration that I maintain with the SRI-PAS and particularly with many of its current and former members, among whom Janusz Kacprzyk, Sławomir Zadrozny, Eulalia Szmidt or Jan Owsinski stand out at present, but which, over time, has grown in breadth and depth, extending to a good number of colleagues from SRI-PAS and DECSAI-UGR.

A bit on scientific writing and collaboration

Well, the above paper dealt with fuzzy optimization problems: From a general fuzzy mathematical programming problem, the particular case of Fuzzy Linear Programming (FLP) problem was derived and its basic formulations were introduced and described in depth. Then, three different extensions were considered. First, from the side of applications, and as a particular case of FLP problems, Fuzzy Transportation problems were analyzed. In second place, the fuzzy vector-maximum problem was studied and finally how to define and solve the dual problem of an FLP problem was discussed.

This article is a relevant proof that, although references are useful and significant in some aspects, the number of citations a paper may receive is not a determining parameter of the impact it may have. Indeed, although so far the number of citations received by that paper has not been very high (68 in Google Scholar, the last ones being those of 2019, i.e. Barros, Pinto and Esmi, 2019; Chopra and Saxena, 2019; Leksakul and Apiromchaiyakul, 2019, and Mishra and Upadhyay, 2019), it has served to develop multiple other activities between both parties, SRI-PAS and DECSAI-UGR, in the form of papers, books, congresses or joint research, innovation and development projects that, to date, have given important results, both nationally and, mainly, internationally.

Although those were difficult times for travel, the year after the publication of that Special Issue of *Control and Cybernetics*, I was lucky enough to meet Janusz Kacprzyk in person. The occasion was in July 1985, when the 1st IFSA World Congress was held in Palma de Mallorca. At that time Enric Trillas was the President of the Spanish National Research Council (CSIC). CSIC, similar in Spain to Polish Academy of Science (PAS) in Poland, had signed scientific collaboration agreements with PAS, and Janusz Kacprzyk had already suggested to Enric Trillas the possibility of organizing an event between the Polish and Spanish scientific communities, an initiative that Enric supported from the very beginning. With that as a starting point, and at Trillas' suggestion, Janusz and I talked about this possible activity in Palma de Mallorca and we agreed to analyze what options we had.

In the midst of those conversations, I was proposed to become a member of the Editorial Board of the Journal and again Janusz Kacprzyk encouraged me to continue publishing in *Control and Cybernetics*. Thus arose the paper of Delgado, Verdegay and Vila (1984), an interesting reference that has received 100 citations so far, the most recent being from this past year 2021, namely De (2021). That paper, co-authored with Miguel Delgado and Amparo Vila, approached Linear Programming (LP) problems, in which some vagueness was supposed about the costs, taking part in the objective function. We proved that when this vagueness is modelled by means of fuzzy numbers, one can solve the problem via an auxiliary conventional multi-objective parametric LP problem, which, based on the Mathematical Programming concept of preferential cone, provides a fuzzy solution to the original fuzzy costs LP problem.

Those were times when communications, no matter how fluid personal relationships were, were very slow. International telephone calls were prohibitively expensive and there was very little funding for science. Much less for the organization of new activities, that is to say, that did not have a tradition in the scientific communities. But between one letter and another, with a lot of work and patience, we finally managed to prepare a proposal for joint Spanish-Polish collaboration that was attractive to both PAS and CSIC, and we obtained funding for the I Spanish-Polish Conference on Computer Science and Systems Analysis, which was held in Granada (Spain) between December 13 and 15, 1988.

As a brief note of that meeting, which was the first congress organized by DECSAI (this unit having just been created in the same year at the University of Granada), I think it is historically interesting to bring here the list of participants. From the Polish side the congress was attended by Professors S. Chanas (TUW), J. Kacprzyk (SRI-PAS), L. Krus (SRI-PAS), R. Kulikowski (SRI-PAS), M. Libura (SRI-PAS), Z. Pawlak (SRI-PAS), L. Słomiński (SRI-PAS), J. Sokołowski (SRI-PAS), J. Sosnowski (SRI-PAS), A. Straszak (SRI-PAS), J. Rudnicki (SRI-PAS), and A. Ziółkowski (SRI-PAS). The participants from the Spanish side were: Professors A. Bahamonde (Uniovi), L. Campos (DECSAI-UGR), J. Cuenca (UPM), A. E. Delgado (USC), M. Delgado (DECSAI-UGR), F. Esteva (CSIC), R. García-Rosa (CSIC), L. M. Laita (UPM), R. Lopez de Mántaras (CSIC), J. Mira (USC), R. Molina (DECSAI-UGR), M. Montserrat (UIB), J. Montero (UCM), S. Moral (DECSAI-UGR), C. Torras (CSIC), L. Valverde (UPC), and J.L. Verdegay (DECSAI-UGR).

Collaboration and history

Going into the subject of the anecdotes on the events that took place during those days in Granada, it comes to my mind that the meeting coincided with the celebration in Spain of the first general strike that was called in the country after the death of Franco. It was on December 14, the strike was almost universally followed and Spain was completely closed. The residence, where the SRI-PAS

participants were staying, also closed its restaurant service. The local organizers, foreseeing this complete closure, tried to find a few days beforehand a place, the restaurant of some friends, where we could be hosted for lunch on that day, because otherwise the Polish colleagues would remain without food all day. Having solved that problem, happy to have solved it, I went to Andrzej Straszak, who was the spokesman of the Polish delegation, and told him that, although they would have to arrange each of their rooms on December 14th, happily the issue of food was solved. I will never forget his astonished face and the laconic reply he gave me: “If there is a strike, you have to strike!” Then he turned and walked away. Needless to say, the next day, no Polish delegates ate.

Although 27 papers were presented at the meeting, no proceedings were published. But the relations were many and very intense, having as a common factor the agreement on the need to have an administrative framework that would allow both institutions, SRI-PAS and DECSAI-UGR, to continue deepening our collaboration. More specifically, it was obvious that the convenience of having a General Agreement for scientific and technical cooperation that, signed and supported by the respective legal representatives of both parties, would allow us to have funding to carry out new initiatives. In a very short time, such an agreement was prepared and signed in 1989. The first action that resulted from this agreement was the trip we made to Poland, specifically to the Technical University of Wroclaw and SRI-PAS in Warsaw, with professors M. T. Lamata, M. A. Vila, M. Delgado and myself.

From that first trip I remember Poland that was very different from today's Poland. Wojciech Jaruzelski ruled and there were many limitations: currency, visa, queues, Cepelia stores, leisure ... On that occasion, I do not remember the reason, we slept in the SRI-PAS, because in the building where the Institute was located, and still is located, in ulica Newelska 6, there was a small apartment for guests, I think on the top floor. I do not know if that apartment still exists. We also had the opportunity on those days to meet, thanks to Janusz Kacprzyk, Professor Mario Fedrizzi, who was making a short visit to SRI-PAS. The first meeting, very brief because Professor Fedrizzi was returning to Trento (Italy) in a few hours, took place at the Forum Hotel in Warsaw and served to know the desire and absolute availability of all those gathered to start joint ventures as soon as we had the opportunity to collaborate.

The opportunity arose within a few months, when in May 1990 the Council of the European Communities adopted a Decision establishing a Trans-European Mobility Program for University Studies (TEMPUS). TEMPUS concerned the Central and Eastern European countries, designated for financial aid, and in particular Poland. The objectives were, among others, to promote increased exchanges and mobility of teaching staff and trainers within the framework of the cooperation process, to increase teaching and learning opportunities in the eligible countries of the languages used in the Community and covered by the LINGUA program, and vice versa, and to enable students from the Community to spend a specific period of study or training in an eligible country.

Within the framework of this program, DECSAI-UGR, SRI-PAS and the University of Trento (Italy), together with the Technical University of Wrocław (Poland), Lorand Eötvös University (Hungary) and the private companies FYCSA-Alcatel (Spain) and Informatica Trentina SpA (Italy), presented the joint European TEMPUS project, called "Computer Science and Systems Analysis Training" (COAST), which was accepted and financed for a period of three years with a total budget of 168,000 ECU, which today would be approximately 400,000.00 Euros.

COAST served to form a Spanish-Polish working team, associated to SRI-PAS and DECSAI, which to date has developed a very high number of missions and common activities, of great visibility, relevance and repercussion all over the world and multiplying the visits of researchers between centers, teaching and research stays and, in short, promoting an international, interdisciplinary and multidisciplinary team that is still carrying out different activities: research projects, joint publications, special sessions in congresses, etc.

Undoubtedly, none of these would have been possible without the starting point, provided by the journal *Control and Cybernetics*, to which I wish all the best for the future.

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