Researches in fuzzy logic started in France at the beginning of the 70s. The purpose of this short survey is to give an historical view of the development of researches on fuzzy sets and systems in France, and not to give a scientific analysis of technical results and international publications in this domain in France.

The originator of the interest in this emerging domain was Arnold Kaufmann (1911-1994), a Professor in Paris, Grenoble and also Louvain (Belgium), who discovered fuzzy sets at their early beginning. His book “Introduction à la Théorie des Sous-Ensembles Flous. Eléments théoriques de base” [1], the first volume of a series of four, was published in 1973 and soon translated into English under the title “Introduction to the theory of Fuzzy Subsets: Fundamental theoretic elements” in 1975 [2]. This book is probably the first textbook on fuzzy sets in English. Arnold Kaufmann was then an active researcher in this field; he was recognized as a pioneer by the French community who paid tribute to him in 1992 at the occasion of a national workshop on fuzzy set theory.

The first one is medicine, thanks to Elie Sanchez, who defended a Dr. Sci. thesis in Human Biology in 1974, entitled “Équations de relations floues” [3] with a proposed application to medical diagnosis assistance. After a sabbatical visit to Berkeley, he published a paper in the very first issue of the new journal Fuzzy Sets and Systems in 1978 on “Resolution of eigen fuzzy sets equations”. He continued to promote fuzzy sets and systems in France, being an Associate Professor in Marseille. Elie Sanchez co-edited several books on fuzzy set theory and applications, the two first ones in 1982 with Madan M. Gupta [4, 5].

Three domains made immediately good use of fuzzy set theory in France.

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A. Kaufmann in Marseille in 1983.
Industrial applications of fuzzy logic started in the eighties on the basis of a few individual relations between French researchers and companies, for instance Electronic Serge Dassault in Paris or EDF in Valenciennes.

The development of industrial applications in France really took off after an exploratory tour organized by the France-Japan society (SFJTI) for a small number of researchers and a group of delegates of French companies, in December 1990, to visit the main Japanese university laboratories working on fuzzy logic, as well as companies commercializing products with fuzzy components, such as Fujitsu, Hitachi, Nissan, Mitsubishi Electric, to name just a few, and in addition the Laboratory for International Engineering Research (LIFE) created with the support of the Japanese Ministry of International Trade and Industry. After this visit, a well-documented report was prepared and proposed to French companies. A press conference was organized in April 1991 by SFJTI. The interest of French companies was immediate and this marked a turning point in the vision of French engineers and scientists on fuzzy logic.

Various cooperations between university laboratories and companies were launched. Radio stations, general public newspapers and institutes prepared interviews, round tables, introductory papers. Special groups of interest were put together by several think tanks. In particular, André Titli, from the LAAS laboratory in Toulouse grasped the subject of fuzzy control and was the co-chair, with Laurent Foulley, of the task force Commande Symbolique et Neuromimétique within the CNRS, exploring the capabilities of neural and fuzzy methods in automatic control. The first half of the 90s was a very stimulating period, providing all kinds of opportunities for fuzzy people and a friendly environment for fuzzy research teams.

After these promising pioneering works, research teams have been active on fuzzy sets and systems in a number of university laboratories. While not claiming to be exhaustive, we can list the most important ones. In Toulouse, Henri Prade and Didier Dubois have been active since the 80s in the IRIT laboratory of the Université Paul Sabatier and André Titli joined the domain in 1991 in the LAAS laboratory. In Paris, the successive laboratories of the Université Pierre et Marie Curie-Paris 6 (Groupe de Recherche C.F. Picard, LAFORIA, LIP6) have hosted a team working on fuzzy logic I headed from 1979 to 2013, which is currently represented by my colleagues Christophe Marsala, Marcin Detryniecki and Marie-Jeanne Lesot, Maria Rifqi being now with the University Pantheon-Assas.

In Paris also, a group of the Telecom-ParisTech institute around Isabelle Bloch has been working on fuzzy methods for image processing for twenty years. In Valenciennes, the Laboratory of Industrial and Human Automation control (LAMIH), launched in 1978 by N. Malvache, is very active in automatic control and human-machine systems under the leadership of Thierry-Marie Guerra. In Marseille, Elie Sanchez built the Neural & Fuzzy Systems Institute. In Lannion, Patrick Bosc launched researches on fuzzy databases in the 80s at IRISA and his team now headed by Olivier Pivert is still specialist of this domain. In Annecy, the LISTIC laboratory has developed researches on fuzzy control and fuzzy sensors for 20 years under the initial guidance of Laurent Foulley, continued by Sylvie Galichet and her colleagues. Other working groups on fuzzy logic exist in Nancy, initiated by Jacques Brémond and Michel Lamotte at the Centre de Recherche en Informatique de Nancy (CRAN) and continued with Eric Levrat, in Montpellier around Anne Laurent and Olivier Strauss, in La Rochelle with Carl Frelicot and his colleagues, in Reims in the CReSTIC laboratory, and in a number of other places.

National workshops have been organized annually, starting in 1991. The so-called Journées Nationales sur les Ensembles Flous organized for the first time in Paris, then in Nîmes in 1992 and 1993, in Lille in 1994, were followed by the so-called Rencontres Francophones sur la Logique Floue et ses Applications (LFA) with an original steering committee consisting of P. Bosc, B. Bouchon-Meunier, D. Dubois, L. Foulloy, M. Grabisch, H. Prade, E. Sanchez, A. Titli. They were organized in Paris in 1995 and in a series of locations in France, except in 2001 where they were held in Mons (Belgium).

Apart from A. Kaufmann’s textbooks, various books in French have been published to help to disseminate fuzzy set theory and fuzzy logic among students, researchers and engineers [17, 18, 19, 20, 21, 22, 23].

Fuzzy researchers in France have always been well integrated in the world community, having organized international events for many years. I had the privilege to invite Lotfi A. Zadeh at a Colloquium organized under the auspices of the CNRS on “Les développements récents de la Théorie de l’Information et leurs applications”, in Cachan, near Paris, in 1977. In Marseille was held an International Colloquium on the theory and applications of fuzzy sets in 1978, which was one of the very first conferences devoted to this topic. It was organized by E. Sanchez, who also chaired the IFAC Symposium on Fuzzy information, knowledge representation, and decision analysis in 1983. In Lyon, the CNRS sponsored a “Table Ronde sur le Flou” in 1980, put together by R. Féron and gathering many of the world pioneers in fuzzy sets.

The International Conference on Information Processing and Management of Uncertainty in Knowledge-based Systems (IPMU) was created in 1986 in Paris, from a common desire of Ronald R. Yager, Lotfi A. Zadeh and myself. It was organized five more times in France, generally in Paris, except in 2002 where it was held in Annecy, the 2014 IPMU conference being prepared in Montpellier. Although the topics of the conference cover all the methods for the management of uncertainty, it is a traditional meeting point for the international fuzzy community.

During the past thirty-five years, Lotfi A. Zadeh has actively supported the French community. Besides strongly supporting the organization of conferences in France, he regularly gave lectures in university seminars, for instance in the Université Pierre et Marie Curie until 2001, and he co-edited books with French researchers.
He was conferred the Doctorate Honoris Causa of two universities: the Université Paul Sabatier in Toulouse in 1986 and the Université Pierre et Marie Curie in Paris in 2001.

The French community, as many others, is indebted to Lotfi Zadeh for his continuous stimulation and support.

References


