



Seminario de Estadística e Investigación Operativa I



Rudolf Seising

University of Vienna and University of Munich

"The Theory of Fuzzy Sets and Systems: History and Epistemology"

Abstract:

In 1965, Lotfi Zadeh, a professor of electrical engineering at the University of California in Berkeley, published the first of his papers on his new Fuzzy Set Theory. Since the 1980s, this mathematical theory of "un-sharp amounts" has been applied with great success in many different fields. Thanks not least of all to extensive advertising campaigns for fuzzy-controlled household appliances and to their prominent presence in the media, first in Japan and then in other countries, the word "fuzzy" has also become very well-known among non-scientists. On the other hand, the story of how Fuzzy Set Theory and its earliest applications originated has remained largely unknown. In this lecture, the history of Fuzzy Set Theory and the ways it was first used are incorporated into the history of 20th century science and technology. Influences from system theory and cybernetics stemming from the earliest part of the 20th century are considered alongside those of communication and control theory from mid-century. The second part of this lecture deals with fuzzy sets and fuzzy relations as a new tool for epistemologists and philosophers of science. This philosophical disciplines deal with connections of empirical and theoretical structures. Scientists observe real systems and phenomena and from that they obtain a data structure. To represent that structure they build a model. In this context we say simplistically that there is a "mapping" from reality to theory. The so-called structuralist approach in philosophy of science uses informal logic and informal set theory to axiomatize empirical theories and their intertheoretic relations. It offers two layers of structures: the empirical and the theoretical layer. The lecture offers a proposal to extend the structuralist view by using fuzzy sets and fuzzy relations to represent structures of perceptions as important components in the philosophy of science. These components have to be settled in an intermediate layer between the empirical and theoretical structures.

29 de enero de 2008, 12:00 horas
Seminario Sixto Ríos (215), Departamento de
Estadística e Investigación Operativa I