Fuzzy Lookup Tables in Classification

Annamaria R. Varkonyi-Koczy, Balazs Tusor

Abstract. Lookup tables can advantageously be used for speeding up classification, recognition, and filtering, e.g. for color filtering in image processing. Fuzzy lookup tables are fuzzified extensions of classical lookup tables that improve the generalization ability and robustness of the classifiers. The reason behind is that they achieve a more flexible association between the input-output pairs. The fuzzy information of the system is stored in suitable structures, in the simplest case implemented as fuzzy matrices or fuzzy tensors. In this talk different forms of fuzzy lookup tables are presented together with successful applications taken from different fields of machine intelligence.

Annamaria R. Varkonyi-Koczy was born in Budapest, Hungary, in 1957. She received the M.Sc. E.E., M.Sc.M.E.-T., and Ph.D. degrees from the Technical University of Budapest in 1981, 1983, and 1996, respectively. In 2010 she presented her D.Sc. Thesis at the Hungarian Academy of Sciences. She was a Researcher of the Research Institute for Telecommunication, Hungary, for six years, followed by four years with the Hungarian Academy of Sciences. From 1991 till 2009 she has been with the Department of Measurement and Information Systems, Budapest University of Technology and Economics in assistant professor and associate professor positions. Since 2009 she is full professor at Obuda University, till 2016 at the Institute of Mechatronics and Vehicle Engineering (from 2010 also Head of Institute), while from 2016 at the Institute of Automation. From 2013 she is also full professor at the Department of Mathematics and Infomatics, J. Selye University, Slovakia. Her research interests include digital image and signal processing, uncertainty handling, machine intelligence, and intelligent computing. She is author/contributor of 26 books, 54 journal papers, and more than 230 conference papers. She is founding chair of the IEEE-WISP and IEEE-SOFA symposium series, general chair of Interacademia'2004, 2008, and 2012, IPC chair of SAMI'2004, SAMI'2005, SAMI'2006, IEEE-ICCA'2005, ICONS'2008, I2MTC'2010 and 2012. Dr. Várkonyi-Kóczy is Fellow of IEEE (from 2011 till 2014 also Distinguished Lecturer), elected Member of the Hungarian Academy of Engineers, former Vice President of the Hungarian Fuzzy Association, and member of the John von Neumann Computer and the Measurement and Automation Societies.