Personal Information

Affiliation

Prof. Dr. Rudolf Kruse
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URL until 2017 http://fuzzy.cs.uni-magdeburg.de
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Place of Birth Rotenburg, Germany
Date of Birth 12.09.1952

Married, two children

Degrees

University of Braunschweig, Germany, M.Sc., Mathematics, with honors, 1979

University of Braunschweig, Germany, Ph.D., Mathematics, with honors, 1980

University of Braunschweig, Germany, Habilitation, Venia legendi in Mathematics, 1984

Employments

Research Assistant, Institute of Stochastics, University of Braunschweig, 1979 - 1984

Senior Researcher, Fraunhofer-Gesellschaft, Braunschweig, 1984 - 1986

Associate Professor, Department of Computer Science, Technical University of Braunschweig, 1986 - 1996

Full Professor, Faculty of Computer Science, Otto-Von-Guericke-University of Magdeburg, since 1996

Biography

Rudolf Kruse held the chair for Computational Intelligence at the school of Computer Science at Otto-von-Guericke-University Magdeburg. He has carried out research and projects in Computational Intelligence, Fuzzy Systems, Fuzzy Control, Artificial Neural Networks, Evolutionary Algorithms, Knowledge Based Systems, Statistics, Bayes Networks, Data Mining and Exploratory Data Analysis. His research group was very successful in various industrial applications. Now he is an Emeritus Professor at the OVGU Magdeburg.

He received his diploma degree in mathematics in 1979 from University of Braunschweig, Germany, and a Ph.D. in mathematics in 1980 as well as the venia legendi in mathematics in 1984 from the same university. Following a stay at the Fraunhofer Gesellschaft, in 1986 he joined the University of Braunschweig as a professor (C2) of computer science. Since 1996, he is a full professor (C4) at the Faculty of Computer science of the University of Magdeburg where he is leading the computational intelligence group.

Rudolf Kruse has authored or coauthored more than 475 referred papers and 39 books. According to Google scholar, he has more than 14000 citations and an h-index of 50 (September 2017). He has served as associate editor for 12 scientific journals. He is a fellow of the international Fuzzy Systems Association (IFSA), fellow of the European Coordinating Committee for Artificial Intelligence (ECCAI) and Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

Rudolf Kruse was the mentor of 35 PhD students. He supervised more than 350 untergraduate and graduate students. He is giving lectures about a broad topic of computational intelligence methods. His group published many student textbooks in

German and English on many aspects of intelligent systems. Some of the most known English monographs are about computational intelligence, i.e. Fuzzy-Systems, Neural Networks, Evolutionary Algorithms and Bayes Networks. These monographs led to the English student textbook entitled Computational Intelligence which appeared in the Springer series Textbooks in Computer Science with corresponding material (lecture slides, exercises, etc.) on the webpage http://www.computational-intelligence.eu .

The first research area where Rudolf Kruse and his group contributed to is fuzzy data analysis. Kruse and his doctorate Meier published the first monograph about fuzzy data analysis already in 1987. These approaches were lively discussed, e.g. in the COST Action IC0702 "Soft Stat" (2009 -2012) which focused on the combination of statistics and soft combining. Results of this new research discipline are presented in the international conference series on Soft Methods in Probability and Statistics (2002 - 2016), where fuzzy data analysis is the major topic, and lots of other fuzzy related journals and conferences. Regarding the industry, Rudolf Kruse inspired the development of many applications especially dealing with fuzzy clustering, e.g. in cooperation with the German Aerospace Center.

His second research area focuses on hybrid intelligent systems. There typical computational intelligence methods are combined, e.g. a fuzzy system for knowledge representation with an artificial neural network for learning. Such a neuro-fuzzy system encodes the fuzzy rule into the network and uses neural network learning algorithms. They can be uses in control, classification and function approximation. Kruse's group published many monographs in this area, for example a book on neuro-fuzzy methods at Wiley in 1997 or a book on fuzzy control for Springer in 2005. Kruse established a conference series on fuzzy systems and soft computing for the German Society of Computer science, starting with a workshop in Braunschweig in 1991. For the development of a fuzzy idle speed controller together with Volkswagen AG, Kruse and his group received the outstanding paper award in IEEE Transactions on Fuzzy Systems in 1996. Working together with VW, one of Kruse's students used such a hybrid intelligent system to design an intelligent gear system in the VW New Beetle. Recent work is on fusion methods for autonomous driving and genetic programming for severeness prediction of accidents. Since 2015 he is in the scientific board of the VW Auto-Uni.

His third research area is imperfect knowledge. Many contributions of his group have been made to handle uncertainties, imprecision, incompleteness or partial inconsistencies. Kruse's monograph Uncertainty and Vagueness in Knowledge-Based Systems on this topic from 1991 was one of the first monographs on Bayes Networks. His monograph (with his doctorate C. Borgelt, 2002) about learning and representing graphical models has been extended and published in a second edition. The ESPRIT Basic Research Action 3085 (named Defeasible Reasoning and Uncertainty Management Systems (DRUMS) focused on these methodologies. Kruse's research group was one the 22 research groups in Europe that participate in that project. In 1991, Kruse established a forum for these groups with the European Conferences on Symbolic and Quantitative Approaches to Reasoning and Uncertainty (ECSQAU, since 1993 ECSQARU). The first conference in Marseille attracted 140

participants. The conference proceedings are still published at Springer every other year. During the time of the DRUMs project, four books about these topics have been edited by him. Rudolf Kruse, Hans-Joachim Lenz and Giacomo Della Riccia (the last doctorate on Norbert Wiener), biannually invited internally renown researchers to the picturesque Palazzo del Torso of the Centre International des Sciences Mécaniques (CISM) in Udine. The revised versions of workshop papers were published in a Springer Series which resulted into seven edited volumes featuring varying topics. His group in cooperation with Dornier implemented the most like first Bayesian network in Germany in 1987. The research on this topic led to a successful outsourced company (Gebhardt Intelligent systems). Here 5000 Bayesian Networks are used on a daily basis in a planning context in automotive industry (VW).

Most recently, Rudolf Kruse is mainly interested in intelligent data analysis. The focus in his forth research area is on the development of new learning methods and temporal data analysis. The interactive data mining platform Information Miner has been established by his group. It is also presented at the international exhibition CEBIT in Hannover. This fourth topic offers a great collection of research questions. Most applications stem from collaborations, e.g. with rating agencies, automotive industry, or telecommunication, but there are also several data analysis applications from neuro-biology and medicine.