



CISM COURSES AND LECTURES NO. 363  
INTERNATIONAL CENTRE FOR MECHANICAL SCIENCES

---

# **MATHEMATICAL AND STATISTICAL METHODS IN ARTIFICIAL INTELLIGENCE**

EDITED BY

G. DELLA RICCIA/ R. KRUSE/ R. VIERTL

---

SPRINGER - VERLAG  
WIEN NEW YORK



# CONTENTS

	Page
Preface	
Fuzzy Specification of Uncertain Knowledge and Vague or Imprecise Information by <i>H. Bandemer</i> .....	1
Some Notes on Possibilistic Learning by <i>J. Gebhardt and R. Kruse</i> .....	23
Statistics with Fuzzy Data by <i>R. Viertl</i> .....	33
Operative Controlling Based on Bayesian Networks Using the Kalman Filter Technique by <i>H.J. Lenz</i> .....	51
Construction, Simulation and Testing of Causal Probabilistic Networks by <i>U.G. Oppel, A. Hierle and M. Noormohammadian</i> .....	59
Conditional Events and Probability in the Approach to Artificial Intelligence through Coherence by <i>R. Scozzafava</i> .....	89
Abduction and Induction Based on Non-Monotonic Reasoning by <i>F. Bergadano and Ph. Besnard</i> .....	105
Independence Relationships in Possibility Theory and their Application to Learning Belief Networks by <i>L.M. de Campos</i> .....	119
Using Abduction to Learn Horn Theories by <i>D. Gunetti</i> .....	131
On Logics of Approximate Reasoning II by <i>P. Hájek</i> .....	147

Base Revision Operations and Schemes: Semantics, Representation, and Complexity  
by *B. Nebel* .....157

On the Notion of Similarity in Case-Based Reasoning  
by *M.M. Richter* .....171

Linear Space Induction in First Order Logic with RELIEFF  
by *U. Pompe and I. Kononenko* .....185

Induction of Decision Trees Using RELIEFF  
by *I. Kononenko and E. Simec* .....199

Representing Examples by Examples  
by *M. Bohanec and I. Bratko* .....221

Green Coffee Grading Using Fuzzy Classification  
by *F. Suggi Liverani* .....237

Learning from Noisy Medical Data: a Comparative Study Based on a Real Diagnostic Problem  
by *B.A. Teather, G. Della Riccia and D. Teather* .....247

List of Participants .....257

.....89

Abduction and Induction Based on Non-Monotonic Reasoning  
by *F. Bergadano and P. Besnard* .....105

Independence Relationships in Possibility Theory and their Application to Learning Belief Networks  
by *J.M. de Campos* .....119

Using Abduction to Learn Horn Theories  
by *D. Gunetti* .....131

On Logics of Approximate Reasoning II  
by *P. Hájek* .....141