

CURRICULUM VITAE

Radim Belohlavek

Personal

Name: Radim Belohlavek
Date of Birth: March 5, 1971
Place of Birth: Pardubice, Czech Republic
Citizenship: Czech Republic

Position

Professor
Department of Computer Science
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Palacky University, Olomouc

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Education and Degrees

- M.Sc. (1994), Palacky University, Olomouc, Czech Republic, Theoretical Cybernetics, Computer Science, and Systems Theory (graduated summa cum laude)
- Ph.D. (1998), Technical University of Ostrava, Czech Republic, Computer Science
- Ph.D. (2001), Palacky University, Olomouc, Czech Republic, Mathematics
- doc. (2001), Associate Professor of Applied Mathematics, University of Ostrava, Czech Republic
- prof. (2005), Professor of Computer Science, Technical University of Ostrava, Czech Republic, appointed by the President of Czech Republic, letters of recommendation by Petr Hjek (Academy of Sciences of CR, Prague), Ladislav J. Kohout (Florida State University), Lotfi A. Zadeh (UCB, Berkeley)
- D.Sc. (2008), Academy of Sciences of the Czech Republic, Prague, Mathematical and Physical Sciences, area Informatics and Cybernetics

Research Interests

- Uncertainty Theories (fuzzy logic, fuzzy sets and fuzzy relational systems, formal systems of fuzzy logic, applications of fuzzy logic and fuzzy sets)

- Data Analysis (formal concept analysis, relational data analysis, dependencies in relational data, relational factor analysis; mathematical foundations and algorithms)
- Theoretical Computer Science and Discrete Mathematics (logics for reasoning about data, relational model of data)

Publication and Citation Summary

- 2 research monographs (Kluwer, Springer), 1 edited book (MIT Press), 9 chapters in research monographs (Academic Press, Chapman & Hall, Elsevier, Springer),
- 90 papers in peer-reviewed journals, 110+ papers in proceedings of peer-reviewed conferences,
- 2200+ citations to my work (Google scholar), H-index 22 (Google Scholar, 12 according to WoS).

EXPERIENCE

Previous Positions

- 2007–2009 Professor (with tenure) of Systems Science
T. J. Watson School of Engineering and Applied Science
State University of New York at Binghamton, U. S. A.
- 2001– Professor (2005–), Chair (2001–2007), Associate Professor (2001–2005)
Dept. Computer Science, Palacky University, Olomouc, Czech Republic
- 1999–2000 Postdoc Research Fellow
Center for Intelligent Systems, Binghamton University – SUNY, U. S. A.
- 1996–2000 Research Fellow, Vice-director
Institute for Fuzzy Modeling, University of Ostrava, Czech Republic
- 1994–1996 Assistant Professor
Dept. Computer Science, Technical University of Ostrava, Czech Republic

Consulting, Collaboration

- 2003–2007, University Hospital, Olomouc, development of system for automatic delivery of muscle relaxants during general anesthesia,
- 2004–2008, PIKE ELECTRONIC, Ltd., development of software for data analysis,
- 2006–2008, University of Western Bohemia, Czech Republic, system for classification of parts in mechanical engineering.

AWARDS AND HONORS

- 2007 Best Paper Award, International Journal of General Systems (for the paper “Do exact shapes of fuzzy sets matter?”, Int. J. Gen. Systems 36(5)(2007), 527—555)
- Best Paper Award, SCIS & ISIS 2006, Tokyo Institute of Technology, Tokyo, Japan (selection from 460 papers, with V. Vychodil)
- listed in several editions of “Marquis Who’s Who in the World”, “Marquis Who’s Who in Science and Engineering”, 7th Edition, 10th Edition 2008–9, “Marquis Who’s Who of Emerging Leaders”, “Marquis Who’s Who in America”,
- recognition by the Rector of Palacky University for Excellence in Research (2002, 2005),
- recognized as “International Scientist of the Year 2004” by International Biographical Centre, Cambridge (UK),

- Scholarship, Oct 1992– Jun 1993, University of Bern, Switzerland,
- Scholarship, Oct–Nov 1997, Johannes Kepler Universität, Linz, Austria,
- NATO Advanced Fellowship B, Feb–Oct 2000.

GRANTS

Research Grants (total \$750,000+)

- Czech Science Foundation, 1999–2001, No. 201/99/P060, “Concept Lattices and Concept Data Analysis in Fuzzy Logic”, principal investigator R. Belohlavek,
- NATO, 2000, “Model theory for fuzzy logic in the foundations of soft computing”, principal investigator R. Belohlavek,
- Czech Science Foundation, 2002–2004, No. 201/02/P076, “Concept lattices over fuzzy and uncertain data: related structures and mathematical foundations of data analysis”, principal investigator R. Belohlavek,
- Czech Academy of Sciences, 2003–2005, No. B1137301, “Relational systems in presence of vagueness and uncertainty: mathematical foundations for applications”, principal investigator R. Belohlavek,
- Czech Academy of Sciences, 2004–2008, No. 1ET101370417, “Hierarchical analysis of complex data”, principal investigator R. Belohlavek, coinvestigator PIKE ELECTRONIC, Ltd.,
- Czech Science Foundation, 2005–2007, No. 201/05/0079, “Formal concept analysis of indeterminate and large data: theory, methods, and applications”, principal investigator R. Belohlavek, participating institutions Technical University of Ostrava (Snášel), Institute of Computer Science, Academy of Sciences of the Czech Republic, Prague (Húsek), Faculty of Informatics and Statistics, University of Economics (Řezanková),
- Department of Health, Czech Republic, 2003–2005, No. ND7665-3/2003, “Neuromuscular blockade monitoring, automatic control of neuromuscular block during general anaesthesia”, principal co-investigator R. Belohlavek,
- Kontakt, Bilateral Cooperation Program, 2006–2007, No. 1-206-33, “Algebraic, logical and computational aspects of fuzzy relational modelling paradigms”, principal investigator in Czech Republic R. Belohlavek, principal investigator in Belgium Prof. B. De Baets (Univ. Ghent),
- Department of Education, Czech Republic, No. MSM 6198959214, “Mathematical Models and Structures”, supervisor for area “Fuzzy Logic and Uncertainty in Data” R. Belohlavek,
- Czech Science Foundation, 2010–2012, No. P202/10/0262, “Decompositions of matrices with binary and ordinal data: theory, algorithms, and complexity”, principal investigator R. Belohlavek, participating institutions Institute of Computer Science, Academy of Sciences of the Czech Republic, Prague (Húsek), Faculty of Informatics and Statistics, University of Economics (Řezanková)
- Czech Science Foundation, 2010–2012, No. P103/10/1056, “Conceptual Processing of Uncertain and Large Data and Knowledge”, principal investigator R. Belohlavek
- Ministry of Trade and Industry of the Czech Republic 2011-2013, No. FR–TI3/722, “System for control optimization of industry processes based on advanced methods of relational data analysis”, principal investigator Dr. S. Opichal, PIKE Electronic, Ltd., Prague, principal co-investigator R. Belohlavek

Other Grants (development, infrastructure) (total \$370,000+)

- Department of Education, Czech Republic, 6× principal investigator of grants focused on development of university infrastructure,
- European Social Fund, 2006–2008, project ESF No. CZ.04.1.03/3.2.15.2/0271, “Distance and Conventional Education of Computer Scientists for Practice: Innovations for Information Society”, principal investigator R. Belohlavek.

PUBLICATIONS

Books

1. *Fuzzy Relational Systems: Foundations and Principles*. Kluwer Academic/Plenum Press (Vol. 20 of IFSR Int. Series on Systems Science and Engineering), New York, 2002 (xii+369 pages). [ISBN 0-306-46777-1]
2. *Fuzzy Equational Logic*. Springer (series: Studies in Fuzziness and Soft Computing, vol. 186), Berlin, 2005, xii+283 pages, 47 illustrations (coauthor Vilém Vychodil). [ISBN 3-540-26254-7]
3. *Concepts and Fuzzy Logic*. The MIT Press, Cambridge, MA (edited book, co-author G. J. Klir).

Edited Volumes

1. Belohlavek R. (Ed.): Fuzzy Logic in System Modeling. Special issue of *Int. J. General Systems* **32**(2003).
2. Belohlavek R., Snasel V. (Eds.): Proceedings of CLA 2004, Second Int. Conference on Concept Lattices and Their Applications, Ostrava, Czech Republic, 2004.
3. Belohlavek R., Snasel V. (Eds.): Proceedings of CLA 2005, Third Int. Conference on Concept Lattices and Their Applications, Olomouc, Czech Republic, 2005.
4. Ben Yahia S., Mephu Nguifo E., Belohlavek R. (Eds.): CLA 2006, Lecture Notes in Computer Science/Lecture Notes in Artificial Intelligence, vol. **4923**, Springer, Berlin, 2006.
5. Belohlavek R., Kruse R. (Eds.). Intelligent Data Analysis. Special issue of *Journal of Computer and System Sciences* **79**(2010). Editor’s foreword, *Journal of Computer and System Sciences* **79**(2010), 1–2.
6. Belohlavek R., Kuznetsov S. O. (Eds.): Concept Lattices and Their Applications. Special issue of *Annals of Mathematics and Artificial Intelligence* (in preparation).

Book Chapters

1. Fuzzy Galois connections and fuzzy concept lattices: From binary relations to conceptual structures. In: Novák V., Perfilova I. (eds.): *Discovering the World with Fuzzy Logic*. Physica-Verlag (Springer-Verlag Company), Heidelberg, New York, 2000, pp. 462-494. [ISBN 3-7908-1330-3]
2. Granulation and granularity via conceptual structures: A perspective from the point of view of fuzzy concept lattices. In: Lin T.Y., Yao Y.Y., Zadeh L.(eds.): *Data Mining, Rough Sets, and Granular Computing*. Physica-Verlag (Springer-Verlag Company), Heidelberg, New York, 2002, pp. 265-289 [ISBN 3-7908-1461-X]

3. Formal concept analysis in geology. In: Demicco R. V., Klir G. J.: *Fuzzy Logic in Geology*. Academic Press, 2003, pp. 191–237. [ISBN 0-12-415146-9]
4. The role of fuzzy logic in sedimentology and stratigraphic models (coauthors R. V. Demicco, G. J. Klir). In: Nikraves M., Aminzadeh F., Zadeh L.A. (Eds.): *Soft Computing and Intelligent Data Analysis in Oil Exploitation*. Chapter 11, pp. 189-217, Elsevier, 2003.[ISBN 0-444-50685-3]
5. Fuzzy neural networks based on fuzzy logic algebras valued relations (coauthors Tagliaferri R., Ciaramella A., Di Nola A.). In: Nikraves M., Zadeh L. A., Korotkith V. (Eds.): *Fuzzy Partial Differential Equations and Relational Equations*, Springer, Berlin, 2004, pp. 116–129.
6. Relational Data, Formal Concept Analysis, and Graded Attributes. In Galindo J. (Ed.): *Handbook of Research on Fuzzy Information Processing in Databases*. Information Science Reference (imprint of IGI Global), Vol. II, pp. 462–489, Hershey, PA, 2008, ISBN 978–1–59904–853–6.
7. Data Dependencies in Codd's Relational Model With Similarities. In: Galindo J. (Ed.): *Handbook of Research on Fuzzy Information Processing in Databases*. Information Science Reference (imprint of IGI Global), Vol. II, pp. 634–656, Hershey, PA, 2008, ISBN 9781599048536 coauthor V. Vychodil.
8. Formal Concept Analysis with Attribute Priorities. Chapter 13 in: Ohsawa Y., Yada K. (Eds.): *Data Mining for Design and Marketing*. Chapman & Hall/CRC, Data Mining and Knowledge Discovery Series, Boca Raton, FL, 2009, pp. 211–222, coauthor V. Vychodil. [ISBN 978-1-4200-7019-4]
9. Belohlavek R., Kruse R., Moewes C.: Fuzzy Logic in Computer Science. Chapter 16 in: Blum, Edward K.; Aho, Alfred V. (Eds.): *Computer Science: The Hardware, Software and Heart of It*. Springer, New York, 2011. [ISBN 978-1-4614-1167-3, DOI 10.1007/978-1-4614-1168-0]

Journal Papers

1. Ideals and congruences in semiloops. **Acta Sci. Math.**(Szeged) **59**(1994), 43-47, (coauthor I.Chajda).
2. Algebra grammars. **Acta Math. et Inf. Univ.Ostrav.** **3**(1995), 73-76.
3. A polynomial characterization of congruence classes. **Algebra Universalis** **37**(1997), 235–242. (coauthor I.Chajda)
4. Backpropagation for interval patterns. **Neural Network World. Int. Journal on Neural & Mass-Parallel Comp. and Inf. Systems** **7**(3)(1997), 335–346.
5. Congruence properties of single algebras. **Discuss. Math.** **17**(1997), 67–78 (coauthor I.Chajda).
6. Polynomially determined congruences in algebras without constants. **Acta Univ. Palacki. Olomouc., Fac. rer. nat., Mathematica**, **36**(1997), 7–14. (coauthor I.Chajda).
7. Note to “The World of Concepts and Logic” (in Czech). **Filozoficky casopis** **46**,3(1998), 473–474.

8. Feedforward networks with fuzzy signals. **Soft Computing** 3(1999), 37–43.
9. Congruence classes in regular varieties. **Acta Math. Univ. Comen.** LXVIII, 1(1999), 71–75 (coauthor I.Chajda).
10. Lattices generated by binary fuzzy relations. **Tatra Mount. Math. Publ.** 16(1999), 11–19 (special issue on fuzzy set theory).
11. Fuzzy Galois connections. **Math. Logic Quarterly** (Zeit. Math. Logik u. Grundl. d. Math.) 45,4(1999), 497–504.
12. A characterization of congruence classes of quasigroups. **Mathematica Slovaca** 50(2000), No. 4, 377–380.
13. Representation of concept lattices by bidirectional associative memories. **Neural Computation** 12,10(2000), 2279–2290. [MIT Press, ISSN 0899-7667]
14. Similarity relations in concept lattices. **Journal of Logic and Computation** Vol.10 No. 6(2000), 823–845. [Oxford University Press, ISSN 0955-792X]
15. Similarity relations and BK-relational products. **Information Sciences** 126(1-4)(2000), 287–295. [Elsevier Science, ISSN 0020-0255]
16. Relative deductive systems and congruence classes. **Multiple-Valued Logic** 5(2000), 259–266 (coauthor I. Chajda).
17. On the regularity of MV-algebras and Wajsberg hoops. **Algebra Universalis** 44(2000), 375–377. [Birkhauser Verlag, ISSN 0002-5240]
18. Fuzzy logical bidirectional associative memory. **Information Sciences** 128(1-2)(2000), 91–103. [Elsevier Science, ISSN 0020-0255]
19. A note on the extension principle. **Journal of Mathematical Analysis and Appl.** 248(2000), 678–682. [Academic Press, ISSN 0022-247X]
20. The block extension property. **It. Journal of Pure and Applied Mathematics** No. 10(2001), 147–151 (coauthor I.Chajda).
21. Lattices of fixed points of fuzzy Galois connections. **Math. Logic Quarterly** 47,1(2001), 111–116. [Wiley-VCH, ISSN 0942-5616]
22. Fuzzy closure operators. **Journal of Mathematical Analysis and Appl.** 262(2001), 473–489. [Academic Press, ISSN 0022-247X]
23. Reduction and a simple proof of characterization of fuzzy concept lattices. **Fundamenta Informaticae** 46(4)(2001), 277–285. [IOS Press, ISSN 0169-2968]
24. A remark on the ideal extension property. **Acta Math. et Inf. Univ.Ostrav.** 9(2001), 13–14. [Univ. Ostrava, ISSN 1211-4774]
25. Galois connections and concept lattices with global-valued equalities. **Multiple-Valued Logic** 6 No. 3-4 (2001), 267–288.
26. Combination of knowledge in fuzzy concept lattices. **Int. Journal of Knowledge-Based Intelligent Engineering Systems** Vol. 6, No. 1(2002), 9–14. [KES (Brighton, UK), ISSN 1327-2314]

27. Fuzzy equational logic. **Archive for Math. Logic** 41(2002), 83–90. [Springer-Verlag, ISSN 0933-5846]
28. Logical precision in concept lattices. **Journal of Logic and Computation** Vol. 12 No. 6(2002), 137–148. [Oxford University Press, ISSN 0955-792X]
29. Determinism and fuzzy automata. **Information Sciences** 143(2002), 205–209. [Elsevier Science, ISSN 0020-0255]
30. Convex sets in algebras. **Acta Univ. Palacki. Olomouc., Fac. rer. nat., Mathematica** 41(2002), 21–33. [Palacky University, ISSN 0231-9721]
31. Learning rule base in linguistic expert systems. **Soft Computing** 7(2002) 2, 79–88 (coauthor V. Novak). [Springer-Verlag, ISSN 1432-7643]
32. Fuzzy closure operators II. **Soft Computing** 7(2002) 1, 53–64. [Springer-Verlag, ISSN 1432-7643]
33. On the capability of fuzzy set theory to represent concepts. **Int. Journal of General Systems** 31(6)(2002), 569–585 (coauthors G.J.Klir, H.W.Lewis,III, E.Way). [Taylor and Francis, ISSN 0308-1079]
34. Some properties of residuated lattices. **Czech. Math. Journal** 53 (128)(2003), 161–171. [Acad. Sci. Czech Republic, ISSN 0011-4642]
35. Cutlike semantics for fuzzy logic and its applications. **Int. Journal of General Systems** 32(4)(2003), 305–319. [Taylor and Francis, ISSN 0308-1079]
36. Birkhoff variety theorem and fuzzy logic. **Archive for Math. Logic** 42(2003), 781–790. [Springer-Verlag, ISSN 0933-5846]
37. Boolean part of BL-algebras. **Acta Univ. Palacki. Olom.** 42(2003), 7–11. [Palacky University, ISSN 0231-9721]
38. Fuzzy closure operators induced by similarity. **Fundamenta Informaticae** 58(2)(2003), 79–91. [IOS Press, ISSN 0169-2968]
39. Concept lattices and order in fuzzy logic. **Annals of Pure and Applied Logic** 128(2004), 277–298. [Elsevier Science]
40. Lattice-type fuzzy order is uniquely given by its 1-cut: proof and consequences. **Fuzzy Sets and Systems** 143(2004), 447–458. [Elsevier Science, ISSN 0165-0114]
41. Concept equations. **Journal of Logic and Computation** Vol. 14, No. 3(2004), 395–403. [Oxford University Press, ISSN 0955-792X]
42. Fuzzy interior operators (coauthor T. Funiokov). **Int. J. General Systems** 33(4)(2004), 315–330. [Taylor and Francis, ISSN 0308-1079]
43. Formal concept analysis with hierarchically ordered attributes (coauthors V. Sklen, J. Zápala). **Int. J. General Systems** 33(4)(2004), 283–294. [Taylor and Francis, ISSN 0308-1079]
44. Vliv odlišných látek rocuronia na jeho farmakodynamický profil: prospektivní studie (in Czech). **Anesteziologie a intenzivní medicína** 15(2004), 269-275. (coauthors M. Adamus, M. Vujickova, M. Janaskova) [ISSN 1214 - 2158]

45. Automatic control of rocuronium-induced neuromuscular block. **European Journal of Anaesthesiology** **21**, Supplement 32(2004), p. 22. (coauthors M. Adamus, J. Koutna, J. Zacpal) [Cambridge University Press, ISSN 0265-0215]
46. Similarity and fuzzy tolerance spaces (coauthor T. Funioková). **Journal of Logic and Computation** Vol. **14**, No. 6(2004), 828–855. [Oxford University Press, ISSN 0955-792X]
47. Vliv odlišných dávek rocuronia na jeho farmakodynamický profil: prospektivní studie. *Anesteziologie a intenzivní medicína*, 15, 2004, s. 269 - 275. (coauthors Adamus M., Vujcikova M., Janaskov E.)
48. Predictability of rocuronium-induced neuromuscular block. **European Journal of Anaesthesiology** **22**, Supplement 34(2005), p. 120 (coauthors M. Adamus, P. Hropko, M. Ludma). [Cambridge University Press, ISSN 0265-0215]
49. Fuzzy closure operators with truth stressers. **Logic Journal of IGPL** **13**(5)(2005), 503–513 (coauthors T. Funiokov, V. Vychodil). [Oxford University Press, ISSN 1367-0751 (paper) 1368-9894 (on-line), DOI 10.1093/jigpal/jzi038]
50. Algebras with fuzzy equalities (coauthor V. Vychodil). **Fuzzy Sets and Systems** **157**(2)(2006), 161–201. [Elsevier Science, ISSN 0165-0114, DOI 10.1016/j.fss.2005.05.044]
51. An answer to Demirci's open question, a clarification of his result, and a correction of his interpretation of the result (coauthor V. Vychodil). **Fuzzy Sets and Systems** **157**(2)(2006), 205–211. [Elsevier Science, ISSN 0165-0114, DOI 10.1016/j.fss.2005.06.016]
52. Fuzzy Horn logic I: proof theory (coauthor V. Vychodil). **Archive for Math. Logic** **45**(1)(2006), 3–51. [Springer-Verlag, ISSN: 0933-5846 (Paper) 1432-0665 (Online), DOI: 10.1007/s00153-005-0287-x]
53. Fuzzy Horn logic II: implicationally defined classes (coauthor V. Vychodil). **Archive for Math. Logic** **45**(2)(2006), 149–177. [Springer-Verlag, ISSN: 0933-5846 (Paper) 1432-0665 (Online), DOI: 10.1007/s00153-005-0287-x]
54. Test of devices being used in Czech Republic for monitoring neuromuscular transmission in anaesthesiology (in Czech: Test přístroje používaných v České republice k monitorování nervosvalového přenosu v anesteziologii). **Anesteziologie a intenzivní medicína** **17**(3)(2006), 145-155. (coauthors Adamus M, Adamus P, Ludma M, Hropko P)
55. Fuzzy attribute logic over complete residuated lattices (coauthor V. Vychodil). **J. Experimental and Theoretical Artificial Intelligence** **18**(2006), 471–480. [Taylor and Francis, ISSN 0952–813X print, ISSN 1362–3079 online, DOI 10.1080/09528130600975816]
56. Automatic control of neuromuscular block during long-lasting neurosurgical interventions (in Czech: Automatické dávkování svalových relaxancií u náročných neurochirurgických výkonů). **Česka a slovenska neurologie a neurochirurgie** **69/102** No. 6(2006), 447–451. (coauthor M. Adamus) [ISSN 1210-7859]
57. Duration of rocuronium-induced neuromuscular block predicted by its dose and onset time: a prospective study (in Czech: Předpověď délky klinického účinku rocuronia pomocí dávky a rychlosti nástupu účinku: prospektivní studie). **Anesteziologie a intenzivní medicína** **17**(5)(2006), 241–245 (coauthors M. Adamus, P. Adamus, M. Vujcikova, E. Janaskova). [ISSN 1214-2158]

58. Fuzzy logic in anaesthesiology as a way of thinking and a tool for practical applications (in Czech: Fuzzy logika v anesteziologii jako způsob uvazovani i nastroj pro prakticke pouziti). **Anesteziologie a intenzivni medicina** **17**(5)(2006), 246–250 (coauthor M. Adamus). [CLS JEP, ISSN 1214-2158]
59. Cisatracurium vs. Rocuronium: A prospective, comparative, randomized study in adult patients under total intravenous anaesthesia (coauthors Adamus M., Koutná J., Vujcikova M., Janasková E.). **Biomedical Papers** **150**(2)(2006), 333–338. [ISSN 1213–8118]
60. On Elkan’s theorems: clarifying their meaning via simple proofs (coauthor G. J. Klir). **Int. J. Intelligent Systems** **22**(2007), 203–207. [J. Wiley, Online ISSN: 1098–111X, Print ISSN: 0884–8173, DOI 10.1002/int.20194]
61. A note on variable threshold concept lattices: threshold-based operators are reducible to classical concept-forming operators. **Information Sciences** **177**(15)(2007), 3186–3191. [Elsevier Science, ISSN 0020-0255, doi:10.1016/j.ins.2007.02.024]
62. Do exact shapes of fuzzy sets matter? **Int. J. of General Systems** **36**(2007), 733–743. [Taylor and Francis, ISSN 0308-1079, DOI: 10.1080/03081070701359167]
63. Fast factorization by similarity in formal concept analysis of data with fuzzy attributes. **J. Computer and System Sciences** **73**(6)(2007), 1012–1022 (coauthors J. Dvorak, J. Outrata). [Elsevier, ISSN 0022-0000, doi:10.1016/j.jcss.2007.03.016]
64. Fuzzy control of neuromuscular block during general anesthesia — system design, development and implementation. **Int. J. General Systems** **36**(6)(2007), 733–743. (coauthor M. Adamus) [Taylor and Francis, ISSN 0308-1079, DOI 10.1080/03081070601058687]
65. Fuzzy concept lattices constrained by hedges. **Journal of Advanced Computational Intelligence and Intelligent Informatics** **11**(6)(2007), 536–545 (coauthor V. Vychodil). [Fuji Technology Press, ISSN 1343-0130]
66. Sigmund E., Zacpal J., Sigmundová D., Mitáš J., Sklenář V., Belohlavek R., Frömel K.: Vyhodnocení IPAQ dotazníků pomocí formální konceptuální analýzy (Evaluation of IPAQ questionnaires using formal concept analysis) *Studia Kinanthropologica* **VIII**(1)(2007), 7–16.
67. Basic algorithm for attribute implications and functional dependencies in graded setting. **Int. J. Foundations of Computer Science** **19**(2)(2008), 297–317 (coauthor V. Vychodil). [World Scientific, ISSN 0129–0541, DOI: 10.1142/S0129054108005693]
68. Fast factorization by similarity of fuzzy concept lattices with hedges. **Int. J. Foundations of Computer Science** **19**(2)(2008), 255–269 (coauthors J. Outrata, V. Vychodil). [World Scientific, ISSN 0129-0541, DOI: 10.1142/S012905410800567X]
69. Characterizing trees in concept lattices. **Int. J. of Uncertainty, Fuzziness and Knowledge-Based Systems** **16**(1)(2008), 1–15 (coauthors B. De Baets, J. Outrata, V. Vychodil). [World Scientific, ISSN 02184885 (paper) 17936411 (on-line), DOI 10.1142/S0218488508005212]
70. Inducing decision trees via concept lattices. **Int. J. General Systems** **38**(4)(2009), 455–467 (coauthors B. De Baets, J. Outrata, V. Vychodil). [Taylor and Francis, ISSN 03081079 (paper) 15635104 (on-line), DOI 10.1080/03081070902857563]

71. On approximate minimization of fuzzy automata. **J. Multiple-Valued Logic and Soft Computing** **15**(2–3)(2009), 125–135 (coauthor M. Krupka). [Old City Publishing, ISSN 1023-6627 (print)]
72. Formal Concept Analysis with Background Knowledge: Attribute Priorities. **IEEE Transactions on Systems, Man, and Cybernetics, Part C** **39**(4)(2009), 399-409 (coauthor V. Vychodil). [IEEE, ISSN 10946977, DOI 10.1109/TSMCC.2008.2012168]
73. Grouping fuzzy sets by similarity. **Information Sciences** **179**(15)(2009), 2656–2661 (coauthor M. Krupka). [Elsevier Science, ISSN 0020-0255, doi:10.1016/j.ins.2009.03.020]
74. Optimal triangular decompositions of matrices with entries from residuated lattices. **Int. J. Approximate Reasoning** **50**(8)(2009), 1250–1258. [Elsevier Science, ISSN 0888-613X, doi:10.1016/j.ijar.2009.05.006]
75. Concepts and fuzzy sets: Misunderstandings, misconceptions, and oversights. **Int. J. Approximate Reasoning** **51**(1)(2009), 23–34 (coauthors G. J. Klir, E. C. Way, H. Lewis, III). [Elsevier Science, ISSN 0888-613X, doi:10.1016/j.ijar.2009.06.012]
76. Discovery of optimal factors in binary data via a novel method of matrix decomposition. **J. Computer and System Sciences** **76**(1)(2010), 3–20 (coauthor V. Vychodil). [Elsevier Science, ISSN 00220000, DOI 10.1016/j.jcss.2009.05.002].
77. Residuated lattices of size ≤ 12 . **Order** **27**(2)(2010), 147–161 (coauthor V. Vychodil). [Springer, ISSN 0167-8094, DOI 10.1007/s1108301091437].
78. Confluence and termination of fuzzy relations. **Information Sciences** **180**(17)(2010), 3288–3303 (coauthors T. Kühr, V. Vychodil). [Elsevier Science, ISSN 0020-0255, doi:10.1007/j.ins.2010.04.007].
79. Central fuzzy sets. **Int. Journal of General Systems** **39**(5)(2010), 525–538 (coauthor M. Krupka). [Taylor and Francis, ISSN 1563-5104 (electronic) 0308-1079 (paper), doi:10.1080/03081071003791339].
80. Computing the lattice of all fixpoints of a fuzzy closure operator. **IEEE Transactions on Fuzzy Systems** **18**(3)(2010), 546–557 (coauthors De Baets B., Outrata J., Vychodil V.). [IEEE, ISSN 10636706, doi:10.1109/TFUZZ.2010.2041006].
81. Optimal decompositions of matrices with grades into binary and graded matrices. **Annals of Mathematics and Artificial Intelligence** **59**(2)(2010), 151–167 (coauthors Bartl E., Konecny J.). [Springer, ISSN (Print) 1573-7470 - ISSN (Online) 1012-2443, doi:0.1007/s10472-010-9185-y].
82. Knowledge spaces with graded knowledge states. **Information Sciences** **181**(8)(2011), 1426–1439 (coauthor Bartl E.). [Elsevier Science, ISSN 0020-0255, doi:10.1016/j.ins.2010.11.040].
83. Codd's relational model from the point of view of fuzzy logic. **Journal of Logic and Computation** (to appear, coauthor Bartl E.). [Oxford University Press, ISSN 0955-792X, doi:10.1093/logcom/exp056].
84. Evaluation of IPAQ questionnaires supported by formal concept analysis. **Information Sciences** (to appear, coauthors Sigmund E., Zacpal J.). [Elsevier Science, ISSN 0020-0255, doi:10.1016/j.ins.2010.04.011].

85. Optimal decompositions of matrices with entries from residuated lattices. **Journal of Logic and Computation** (to appear). [Oxford University Press, ISSN 0955-792X, doi:].

Conference Proceedings Papers

1. Multilayer neural networks with fuzzy signals - adaptation and some remarks. *Proc. of IFSA'97 World Congress*, vol.II, 537–542, Academia, Prague, 1997. [ISBN 80-200-0633-8]
2. Learning linguistic context for linguistic oriented fuzzy control. *Proc. of FUZZ-IEEE'97*, vol.II, 1167–1172, IEEE Press, Barcelona, 1997 (coauthor V. Novk). [ISBN 0-7803-3796-4,]
3. Object oriented implementation of fuzzy logic systems. In Camarinha-Matos L.M., Afsarmanesh H., Marik V. (eds.): *Intelligent Systems for Manufacturing. Multiagent Systems and Virtual Organizations*. Kluwer, Boston-Dordrecht-London, 1998, pp. 589–594 (coauthors A. Dvok, D. Jedelský, V. Novák). [ISBN 0-412-84670-5]
4. Fuzzy concepts and conceptual structures: induced similarities. *Joint Conf. Inf. Sci.'98 Proceedings*, Vol. I, pp. 179–182, Durham, USA, 1998. [Assoc. Intel. Machinery, ISBN 0-9643456-7-6]
5. Fuzzy logical bidirectional associative memory for concepts representation. *Joint Conf. Inf. Sci.'98 Proceedings*, Vol. II, pp. 123-126, Durham, USA, 1998. [Assoc. Intel. Machinery, ISBN 0-9643456-7-6]
6. Logical precision in conceptual structures: logical approach to granularity exemplified on fuzzy concept lattices. *Proc. of Soft Computing'99 Conference*, Genova, Italy, pp. 619-623.
7. An intermediate property between permutability and local permutability. in Denecke K., H.-J. Vogel (eds.): *General Algebra and Applications*, Shaker Verlag, Aachen 2000, 19-24 (coauthor I.Chajda). [ISBN 3-8265-7983-6]
8. Model theory for fuzzy logic in the foundations of soft computing. *Proc. 2000 IEEE Int. Conference on Systems, Man & Cybernetics*. Nashville, Tennessee, USA, 2000, pp. 3635-3640.
9. Lattice type fuzzy order and closure operators in fuzzy ordered sets. *Proc. Joint 9th IFSA World Congress and 20th NAFIPS International Conference*, 2001, Vancouver, Canada, IEEE Press, pp. 2281-2286. [ISBN 0-7803-7079-1, IEEE Catalogue Number: 01TH8569C]
10. Algorithms for fuzzy concept lattices. *Proc. Fourth Int. Conf. on Recent Advances in Soft Computing, RASC 2002*. Nottingham, United Kingdom, 12-13 December, 2002, pp.67-68 (extended abstract); pp. 200-205 (full paper on the included CD). [ISBN 1-84233-0764]
11. Cutlike semantics for fuzzy logic. *Proc. Fourth Int. Conf. on Recent Advances in Soft Computing*. Nottingham, United Kingdom, 12-13 December, 2002, pp.135-136 (extended abstract); pp. 405-410 (full paper on the included CD). [ISBN 1-84233-0764]
12. Fuzzy closure operators induced by similarity. In: T. Bilgic et al. (Eds.): *Proc. IFSA 2003, Lecture Notes in Artificial Intelligence* **2715**, pp. 71–78, Springer, 2003.
13. Algebras with fuzzy equalities. *Proceedings of the 10th IFSA 2003 World Congress*, ISBN 975-518-208-X, pp. 1–4 (coauthor V. Vychodil).

14. Similarity and its modeling (in Czech: Podobnost a její modelování). In: V. Snášel (Ed.): *Znalosti 2004*, 309–316 (coauthor V. Snášel).
15. Concept lattices and formal concept analysis (in Czech: Konceptuální svazy a formální konceptuální analýza), invited plenary lecture. In: V. Snášel (Ed.): *Znalosti 2004*, 66–84.
16. Concept lattices constrained by attribute dependencies. In: Proc. DATESO 2004, CEUR Workshop Proceedings, pp. 63-73 (coauthors V. Sklenar, J. Zacpal). [ISBN 80-248-0457-3]
17. Concept lattices constrained by equivalence relations. In: Proc. CLA 2004, pp. 58–66 (coauthors V. Sklenář, J. Zacpal). [ISBN 80-248-0597-9]
18. Fast factorization of concept lattices by similarity: solution and an open problem. In: Proc. CLA 2004, pp. 47–57 (coauthors J. Dvořák, J. Outrata). [ISBN 80-248-0597-9]
19. Expressive capability of AD-formulas in constraining concept lattices. In: Proc. DATAKON 2004, pp. 201-210 (coauthors V. Sklenar, J. Zacpal). [ISBN 80-210-3516-1]
20. Implications from data with fuzzy attributes. In: AISTA 2004 in cooperation with IEEE Computer Society Proceedings, 15–18 November 2004, Kirchberg - Luxembourg, 5 pp. (coauthors M. Chlupová, V. Vychodil). [ISBN 2-9599776-8-8]
21. Fast factorization by similarity in formal concept analysis. In: AISTA 2004 in cooperation with IEEE Computer Society Proceedings, 15-18 November 2004, Kirchberg - Luxembourg, 7 pp. (coauthors J. Dvorak, J. Outrata). [ISBN 2-9599776-8-8]
22. Formal concept analysis constrained by attribute dependencies (short paper). In: AISTA 2004 in cooperation with IEEE Computer Society Proceedings, 15-18 November 2004, Kirchberg - Luxembourg, 4 pp. (coauthors V. Sklenar, J. Zacpal). [ISBN 2-9599776-8-8]
23. Rocuronium ke kratkodobe svalove relaxaci (Czech). Proceedings of XI. Minarovy dny, Plzen, Czech Republic, 14-15 May, 2004 (coauthors M. Adamus, J. Koutna, M. Vujcikova, E. Janaskova). [ISBN]
24. Crisply generated fuzzy concepts: reducing the number of concepts in formal concept analysis. *Proc. 5th Int. Conf. on Recent Advances in Soft Computing, RASC 2004*. Nottingham, United Kingdom, 16-18 December, 2004, pp.63 (extended abstract); pp. 524–529 (full paper on the included CD), (coauthors V. Sklenar, J. Zacpal). [ISBN 1-84233-110-8]
25. Direct factorization in formal concept analysis by factorization of input data. *Proc. 5th Int. Conf. on Recent Advances in Soft Computing, RASC 2004*. Nottingham, United Kingdom, 16-18 December, 2004, pp.69 (extended abstract); pp. 578–583 (full paper on the included CD), (coauthors J. Dvorak, J. Outrata). [ISBN 1-84233-110-8]
26. Galois connections with truth stressers: foundations for formal concept analysis of object-attribute data with fuzzy attributes. *Advances in Soft Computing* 2(2005), 205–219 (Reusch B. (Ed.): Computational Intelligence, Theory and Applications), Springer-Verlag, Berlin (coauthors T. Funiokova, V. Vychodil). [ISSN print edition 1615-3871, ISBN 2-540-22807]
27. Formal concept analysis constrained by attribute-dependency formulas (coauthor V. Sklenar). In: B. Ganter and R. Godin (Eds.): ICFCA 2005, Lecture Notes in Computer Science **3403**, pp. 176–191, Springer-Verlag, Berlin/Heidelberg, 2005. [ISBN 3-540-24525-1]

28. Crisply Generated Fuzzy Concepts (coauthor V. Sklenar, J. Zaczpal). In: B. Ganter and R. Godin (Eds.): ICFCA 2005, Lecture Notes in Computer Science **3403**, pp. 268–283, Springer-Verlag, Berlin/Heidelberg, 2005. [ISBN 3-540-24525-1]
29. Concept lattices constrained by systems of partitions. In: Znalosti 2005, 5–8. (coauthors V. Sklenář, J. Zaczpal)
30. Reducing the size of fuzzy concept lattices by hedges. In: FUZZ-IEEE 2005, The IEEE International Conference on Fuzzy Systems, May 22-25, 2005, Reno (Nevada, USA), pp. 663-668 (proceedings on CD), abstract in printed proceedings, p. 44, ISBN 0-7803-9158-6, (coauthor V. Vychodil).
31. Implications from data with fuzzy attributes vs. scaled binary attributes. In: FUZZ-IEEE 2005, The IEEE International Conference on Fuzzy Systems, May 22-25, 2005, Reno (Nevada, USA), pp. 1050-1055 (proceedings on CD), abstract in printed proceedings, p. 53, ISBN 0-7803-9158-6, (coauthor V. Vychodil).
32. Fuzzy attribute logic: syntactic entailment and completeness. In: JCIS 2005, 8th Joint Conference on Information Sciences, July 21-26, Salt Lake City, Utah, USA, pp. 78-81 (proceedings on CD), ISBN 0-9707890-3-3, (coauthor V. Vychodil).
33. Reducing attribute implications from data tables with fuzzy attributes to tables with binary attributes. In: JCIS 2005, 8th Joint Conference on Information Sciences, July 21-26, Salt Lake City, Utah, USA, pp. 82-85 (proceedings on CD), ISBN 0-9707890-3-3 (coauthor V. Vychodil).
34. Invariance to scaling in formal concept analysis of data tables with fuzzy attributes. In: JCIS 2005, 8th Joint Conference on Information Sciences, July 21-26, Salt Lake City, Utah, USA, pp. 86-89 (proceedings on CD), ISBN 0-9707890-3-3.
35. Fuzzy attribute logic: attribute implications, their validity, entailment, and non-redundant basis. Proc. IFSA 2005 World Congress, July 28-31, 2005, Beijing, China, Vol. I, pp. 622–627, Springer, ISBN 7-302-11377-7 (coauthor V. Vychodil).
36. Galois connections with hedges. Proc. IFSA 2005 World Congress, July 28-31, 2005, Beijing, China, Vol. II, pp. 1250–1255, Springer, ISBN 7-302-11377-7 (coauthors T. Funiokova, V. Vychodil).
37. What is a fuzzy concept lattice? In: Proc. CLA 2005, 3rd Int. Conference on Concept Lattices and Their Applications, September 7–9, 2005, Olomouc, Czech Republic, pp. 34–45, ISBN 80-248-0863-3 (coauthor V. Vychodil).
38. Formal concept analysis over attributes with levels of granularity. In: Mohammadian M.: CIMCA 2005, Proc. Int. Conf. Comput. Intelligence for Modelling, Control and Automation, Vienna, Austria, 28-30 November, 2005, IEEE Computer Society, Los Alamitos, CA, pp. 619-624 (coauthor V. Sklenar). [ISBN 0-7695-2504-0]
39. Fuzzy attribute implications: computing non-redundant bases using maximal independent sets. In: S. Zhang and R. Jarvis (Eds.): AI 2005, Lecture Notes in Artificial Intelligence **3809**, pp. 1126–1129, Springer-Verlag, Berlin/Heidelberg, 2005 (coauthor V. Vychodil).
40. Axiomatizations of fuzzy attribute logic. In: Prasad B. (Ed.): IICAI 2005, Proc. 2nd Indian International Conference on Artificial Intelligence, Pune, India, Dec 20–22, 2005, ISBN 0–9727412–1–6, pp. 2178–2193 (coauthor V. Vychodil).

41. Functional dependencies of data tables over domains with similarity relations. In: Prasad B. (Ed.): IICAI 2005, Proc. 2nd Indian International Conference on Artificial Intelligence, Pune, India, Dec 20–22, 2005, ISBN 0–9727412–1–6, pp. 2486–2504 (coauthor V. Vychodil).
42. Attribute implications in a fuzzy setting. In: Missaoui R., Schmid J. (Eds.): ICFCA 2006, Lecture Notes in Artificial Intelligence **3874**, pp. 45–60, Springer-Verlag, Berlin/Heidelberg, 2006 (coauthor V. Vychodil).
43. Data tables with similarity relations: functional dependencies, complete rules and non-redundant bases. In: M.L. Lee, K.L. Tan, and V. Wuwongse (Eds.): DASFAA 2006, Lecture Notes in Computer Science **3882**, pp. 644–658, Springer-Verlag, Berlin/Heidelberg, 2006 (coauthor V. Vychodil).
44. Computing non-redundant bases of if-then rules from data tables with graded attributes. In: Proc. IEEE GrC 2006, 2006 IEEE International Conference on Granular Computing, Atlanta, GA, May 10–12, 2006, pp. 205–210 (coauthor V. Vychodil). [IEEE Catalog Number 06EX1286, ISBN 1-4244-0133-X]
45. Dense rectangles in object-attribute data. In: Proc. IEEE GrC 2006, 2006 IEEE International Conference on Granular Computing, Atlanta, GA, May 10–12, 2006, pp. 586–591 (coauthor V. Vychodil). [IEEE Catalog Number 06EX1286, ISBN 1-4244-0133-X]
46. Estimations of similarity in formal concept analysis of data with graded attributes. In: Last M., Szczepaniak P. S., Volkovich Z., Kandel A. (Eds.): Advances in Web Intelligence and Data Mining, *Studies in Computational Intelligence*, vol. **23**, pp. 243–252, Springer-Verlag, Berlin/Heidelberg, 2006 (coauthor V. Vychodil). [Springer-Verlag Berlin Heidelberg 2006, ISBN 3-540-33879-9, ISSN 1860-949X]
47. Thresholds and shifted attributes in formal concept analysis of data with fuzzy attributes. In: H. Schärfe, P. Hitzler, and P. Ohrstrom (Eds.): Proc. ICCS 2006, Lecture Notes in Artificial Intelligence **4068**, pp. 117–130, Springer-Verlag, Berlin/Heidelberg, 2006 (coauthors J. Outrata, V. Vychodil).
48. Formal concept analysis with constraints by closure operators. In: H. Schärfe, P. Hitzler, and P. Ohrstrom (Eds.): Proc. ICCS 2006, Lecture Notes in Artificial Intelligence **4068**, pp. 131–143, Springer-Verlag, Berlin/Heidelberg, 2006 (coauthor V. Vychodil).
49. Replacing full rectangles by dense rectangles: concept lattices and attribute implications. IEEE IRI 2006, The 2006 IEEE Int. Conf. Information Reuse and Integration, Sep 16–18, 2006, Waikoloa Village, Hawaii, USA, pp. 117–122 (coauthor V. Vychodil). [IEEE Catalog Number 06EX1467, ISBN 0-7803-9788-6]
50. Similarity issues in attribute implications from data with fuzzy attributes. IEEE IRI 2006, The 2006 IEEE Int. Conf. Information Reuse and Integration, Sep 16–18, 2006, Waikoloa Village, Hawaii, USA, pp. 132–135 (coauthor V. Vychodil). [IEEE Catalog Number 06EX1467, ISBN 0-7803-9788-6]
51. Relational model of data over domains with similarities: an extension for similarity queries and knowledge extraction. IEEE IRI 2006, The 2006 IEEE Int. Conf. Information Reuse and Integration, Sep 16–18, 2006, Waikoloa Village, Hawaii, USA, pp. 207–213 (coauthor V. Vychodil). [IEEE Catalog Number 06EX1467, ISBN 0-7803-9788-6]

52. Properties of models of fuzzy attribute implications. SCIS & ISIS 2006, Int. Conf. Soft Computing and Intelligent Systems & Int. Symposium on Intelligent Systems, Sep 20–24, 2006, Tokyo, Japan, pp. 291–296 (coauthor V. Vychodil). [ISSN 1880-3741]
53. Reducing the size of fuzzy concept lattices by fuzzy closure operators. SCIS & ISIS 2006, Int. Conf. Soft Computing and Intelligent Systems & Int. Symposium on Intelligent Systems, Sep 20–24, 2006, Tokyo, Japan, pp. 309–314 (coauthor V. Vychodil). [ISSN 1880-3741]
54. On Boolean factor analysis with formal concepts as factors. SCIS & ISIS 2006, Int. Conf. Soft Computing and Intelligent Systems & Int. Symposium on Intelligent Systems, Sep 20–24, 2006, Tokyo, Japan, pp. 1054–1059 (coauthor V. Vychodil). [ISSN 1880-3741]
55. Pavelka-style fuzzy logic for attribute implications. In: Cheng H. D., Chen S. D., Lin R. Y. (Eds.): Proceedings of the 9th Joint Conference on Information Sciences, Advances in Intelligent Systems Research, 2006, Kaohsiung, Taiwan, ROC, pp. 1156–1159 (coauthor V. Vychodil). [Joint Conference on Information Sciences, DOI 10.2991/jcis.2006.282, ISBN 9789078677017]
56. Semantic entailment of attribute-dependency formulas and their non-redundant bases. In: Cheng H. D., Chen S. D., Lin R. Y. (Eds.): Proceedings of the 9th Joint Conference on Information Sciences, Advances in Intelligent Systems Research, 2006, Kaohsiung, Taiwan, ROC, pp. 747–750 (coauthor V. Vychodil). [Joint Conference on Information Sciences, DOI 10.2991/jcis.2006.282, ISBN 9789078677017]
57. Axiomatization of fuzzy attribute logic over complete residuated lattices. In: Cheng H. D., Chen S. D., Lin R. Y. (Eds.): Proceedings of the 9th Joint Conference on Information Sciences, Advances in Intelligent Systems Research, 2006, Kaohsiung, Taiwan, ROC, pp. 1152–1155 (coauthor V. Vychodil). [Joint Conference on Information Sciences, DOI 10.2991/jcis.2006.282, ISBN 9789078677017]
58. On factorization by similarity of fuzzy concept lattices with hedges. Proc. CLA 2006, 4th Int. Conference on Concept Lattices and Their Applications, Oct 30–Nov 1, 2006, Hammamet, Tunisia, pp. 57–69 (coauthors J. Outrata, V. Vychodil). [ISBN 978–9973–61–481–0]
59. Graded LinClosure. Proc. CLA 2006, 4th Int. Conference on Concept Lattices and Their Applications, Oct 30–Nov 1, 2006, Hammamet, Tunisia, pp. 71–84 (coauthor V. Vychodil). [ISBN 978–9973–61–481–0]
60. Reducing the size of if-then rules generated from data tables with graded attributes. In: Mohammadian M. (Ed.): Proc. CIMCA 2006, Sydney, Australia, 2006, 6 pages, ISBN 0–7695–2731–0 (coauthor V. Vychodil).
61. Codd's relational model of data and fuzzy logic: comparisons, observations, and some new results. In: Mohammadian M. (Ed.): Proc. CIMCA 2006, Sydney, Australia, 2006, 6 pages, ISBN 0–7695–2731–0 (coauthor V. Vychodil).
62. Scales behind computational intelligence: exploring properties of finite lattices. Proceedings of the 2007 IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2007), 2007, pp. 556563 (coauthor V. Vychodil). [IEEE, Ompress, ISBN 1424406986]

63. On proofs and rule of multiplication in fuzzy attribute logic. *Lecture Notes in Artificial Intelligence* **4529**, pp. 471–480, P. Melin et al. (Eds.): Proc. IFSA 2007 World Congress, Cancun, Mexico, June 18–21, 2007, Springer-Verlag, Berlin (coauthor V. Vychodil).
64. Counting finite residuated lattices. *Lecture Notes in Artificial Intelligence* **4529**, pp. 461–470, P. Melin et al. (Eds.): Proc. IFSA 2007 World Congress, Cancun, Mexico, June 18–21, 2007, Springer-Verlag, Berlin (coauthor V. Vychodil).
65. Relational factor analysis with circ-matrix decomposition. Proc. NAFIPS 2007, San Diego, California June 24–27, 2007, pp. 152–157, Omnipress (coauthor V. Vychodil). [IEEE Catalog Number: 07TH8957C, ISBN: 1–4244–1214–5, Library of Congress: 2007924575]
66. Approximating infinite solution sets by discretization of the scales of truth degrees. Proc. NAFIPS 2007, San Diego, California June 24–27, 2007, pp. 325–330, Omnipress (coauthors M. Krupka, V. Vychodil). [IEEE Catalog Number: 07TH8957C, ISBN: 1–4244–1214–5, Library of Congress: 2007924575]
67. On construction of MRAP-sequences. Proc. Joint Conference of Information Sciences, JCIS 2007, Salt Lake City, UT, World Scientific Publishing, 7 pp. (coauthor V. Vychodil). [doi:10.1142/9789812709677_0171]
68. Completeness of inference and efficient computation of attribute-dependency formulas for tabular data. Proc. Joint Conference of Information Sciences, JCIS 2007, Salt Lake City, UT, World Scientific Publishing, 7 pp. (coauthor V. Vychodil). [doi:10.1142/9789812709677_0027]
69. Approximate minimization of fuzzy automata. Proc. Joint Conference of Information Sciences, JCIS 2007, Salt Lake City, UT, World Scientific Publishing, 7 pp. (coauthor M. Krupka). [doi:10.1142/9789812709677_0194]
70. Knowledge Spaces, Attribute Dependencies, and Graded Knowledge States. In: FUZZ-IEEE 2007, The IEEE International Conference on Fuzzy Systems, London, UK, July 23–26, 2007, pp. 871–876 (coauthor E. Bartl). [IEEE Catalog Number: 07CH37904C, ISBN: 1-4244-1210-2, ISSN: 1098-7584]
71. Scaling, Granulation, and Fuzzy Attributes in Formal Concept Analysis. In: FUZZ-IEEE 2007, The IEEE International Conference on Fuzzy Systems, London, UK, July 23–26, 2007, pp. 918–923 (coauthor J. Konečný). [IEEE Catalog Number: 07CH37904C, ISBN: 1-4244-1210-2, ISSN: 1098-7584]
72. Lindigs algorithm for concept lattices over graded attributes. In: V. Torra, Y. Narukawa, and Y. Yoshida (Eds.): MDAI 2007, Modeling Decisions for Artificial Intelligence, LNAI **4617**, pp. 156–167, Springer-Verlag Berlin Heidelberg 2007 (coauthors B. De Baets, J. Outrata, V. Vychodil). doi:10.1007/978-3-540-73729-2_15
73. Trees in concept lattices. In: V. Torra, Y. Narukawa, and Y. Yoshida (Eds.): MDAI 2007, Modeling Decisions for Artificial Intelligence, LNAI **4617**, pp. 174–184, Springer-Verlag Berlin Heidelberg 2007 (coauthors B. De Baets, J. Outrata, V. Vychodil). doi:10.1007/978-3-540-73729-2_17
74. Relational algebra for ranked tables with similarities: properties and implementation. In: M. R. Berthold, J. Shawe-Taylor, and N. Lavrač (Eds.): IDA 2007, LNCS **4723**, pp. 140–151, 2007 (coauthors S. Opichal, V. Vychodil).

75. Evaluation of questionnaires by means of formal concept analysis. In: Diatta J., Eklund P., Liquiere M. (Eds.): CLA 2007, Int. Conference on Concept Lattices and Their Applications, October 24–26, Montpellier, France, pp. 100–111, 2007. (coauthor Sklenar V., Zacpal J., Sigmund E.).
76. Formal concepts as optimal factors in Boolean factor analysis: implications and experiments. In: Diatta J., Eklund P., Liquiere M. (Eds.): CLA 2007, Int. Conference on Concept Lattices and Their Applications, October 24–26, Montpellier, France, pp. 192–202, 2007 (coauthor V. Vychodil).
77. Inducing decision trees via concept lattices. In: Diatta J., Eklund P., Liquiere M. (Eds.): CLA 2007, Int. Conference on Concept Lattices and Their Applications, October 24–26, Montpellier, France, pp. 274–285, 2007 (coauthors J. Outrata, V. Vychodil).
78. Direct factorization by similarity of fuzzy concept lattices by factorization of input data. In: Ben Yahia S. et al.: CLA 2006, Concept Lattices and Their Applications, LNAI **4923**, pp. 67–78, Springer, 2008 (coauthors J. Outrata, V. Vychodil). [Springer, ISBN 978–3–540–78920–8, DOI 10.1007/978–3–540–78921–5_4]
79. Graded LinClosure and its role in relational data analysis. In: Ben Yahia S. et al.: CLA 2006, Concept Lattices and Their Applications, LNAI **4923**, pp. 67–78, Springer, 2008 (coauthors J. Outrata, V. Vychodil). [Springer, ISBN 978–3–540–78920–8, DOI 10.1007/978–3–540–78921–5_4]
80. Adding Background Knowledge to Formal Concept Analysis via Attribute Dependency Formulas. ACM SAC 2008, Proc. 23rd Annual ACM Symposium on Applied Computing, Fortaleza, Ceara, Brazil, March 16–20, 2008, pp. 938–943 (coauthor V. Vychodil).
81. Optimal triangular decompositions of matrices with grades. Proc. ROGICS 2008. Int. Conference on Relations, Orders and Graphs: Interaction with Computer Science. May 12–17, 2008, Mahdia, Tunisia, pp. 512–521.
82. Discovery of factors in binary data via triangular decomposition of matrices. Proc. IPMU 2008, Torremolinos (Malaga, Spain), June 22–27, 2008, pp. 47–54. .
83. Central points and approximation in residuated lattices. Central points and approximation in residuated lattices. Proc. IPMU 2008, Torremolinos (Malaga, Spain), June 22–27, 2008, pp. 94–100 (coauthor M. Krupka).
84. Optimal decompositions of matrices with grades. IEEE IS 2008, Proc. Intl. IEEE Conference on Intelligent Systems 2008, Varna, Bulgaria, pp. 15–2–15–7, IEEE Catalog Number CFP08802-PRT, ISBN 978–1–4244–1740–7.
85. Factor structures and central points by similarity. IEEE IS 2008, Proc. Intl. IEEE Conference on Intelligent Systems 2008, Varna, Bulgaria, pp. 15–8–15–11, IEEE Catalog Number CFP08802-PRT, ISBN 978–1–4244–1740–7 (coauthor M. Krupka).
86. Isotone Galois connections and concept lattices with hedges. IEEE IS 2008, Proc. Intl. IEEE Conference on Intelligent Systems 2008, Varna, Bulgaria, pp. 15–24–15–28, IEEE Catalog Number CFP08802-PRT, ISBN 978–1–4244–1740–7.
87. Optimal decompositions of matrices with grades into binary and graded matrices. Proc. CLA 2008, The Sixth Intl. Conference on Concept Lattice and Their Applications, Olomouc, Czech Republic, pp. 59–70, ISBN 978–80–244–2111–7 (coauthors Bartl E., Konecny J.).

88. Knowledge spaces with graded knowledge states. Proc. International Symposium on Knowledge Acquisition and Modeling, 2008, 21-22 Dec, pp. 3–8 (coauthor E. Bartl). [IEEE Computer Society, ISBN 978-0-7695-3488-6, DOI 10.1109/KAM.2008.106]
89. A Logic of attribute containment. Proc. International Symposium on Knowledge Acquisition and Modeling, 2008, 21-22 Dec, pp. 246–251 (coauthor J. Konecny). [IEEE Computer Society, ISBN 978-0-7695-3488-6, DOI 10.1109/KAM.2008.107]
90. Factor analysis of incidence data via novel decomposition of matrices. Lecture Notes in Artificial Intelligence **5548**(2009), 83–97 (coauthor V. Vychodil). [Springer, ISSN 0302-9743, DOI 10.1007/978-3-642-01815-2_8]
91. A novel approach to cell formation. Lecture Notes in Artificial Intelligence **5548**(2009), 210–223 (coauthors N. Kulkarni, V. Vychodil). [Springer, ISSN 0302-9743, DOI 10.1007/978-3-642-01815-2_16]
92. Logical foundations for similarity-based databases. Lecture Notes in Computer Science **5667**(2009), 137–151 (coauthor V. Vychodil). [Springer, ISSN 0302-9743, DOI 10.1007/978-3-642-04205-8_13]
93. Confluence and Related Properties of Fuzzy Relations. Proceedings of FUZZ-IEEE 2009: The 18th IEEE International Conference on Fuzzy Systems, 2009, pp. 569–574 (coauthors T. Kühr, V. Vychodil). [IEEE, DOI 10.1109/FUZZY.2009.5277248, ISBN 978-1-4244-3596-8, ISSN 1098-7584]
94. Query systems in similarity-based databases: logical foundations, expressive power, and completeness. ACM SAC 2010, 1648-1655 (coauthor V. Vychodil). [ACM Press, DOI 10.1145/1774088.1774444, ISBN 9781605586380/10/03]
95. Background Knowledge in Formal Concept Analysis: Constraints via Closure Operators. ACM SAC 2010, 1113-1114 (coauthor V. Vychodil). [ACM Press, DOI 10.1145/1774088.1774322, ISBN 978160558638]
96. Reconstruction of belemnite evolution using formal concept analysis. Proc. of the 20th European Meeting on Cybernetics and Systems Research 2010, Vienna, Austria. (ed: R. Trappl), pp. 32–38 (coauthors Kostak M., Osicka P.). [ISBN 3-85206-178-8]
97. Triadic concept analysis of data with fuzzy attributes. Proc. 2010 IEEE International Conference on Granular Computing, pp. 661–665, San Jose, California, August 14–16 (coauthor P. Osicka). [ISBN 978-0-7695-4161-7]
98. Optimal factorization of three-way binary data. IEEE Symposium on Foundations and Practice of Data Mining in GrC2010, 2010, pp. 61-66, San Jose, California, August 14–16. [IEEE Computer Society, DOI 10.1109/GrC.2010.181, ISBN 9780769541617]
99. Factorizing three-way binary data with triadic formal concepts. Lecture Notes in Artificial Intelligence 6276(2010), 471480 (coauthor V. Vychodil). [Springer, DOI 10.1007/9783642153877_51, ISSN 0302-9743, ISBN 9783642153860]
100. Factorizing three-way binary data. Lecture Notes in Electrical Engineering 62(2010), 23-26 (coauthor V. Vychodil). [Springer, DOI 10.1007/9789789048197941_5, ISSN 1876-1100 ISBN 9789048197934]

101. Operators and Spaces Associated to Matrices with Grades and Their Decompositions II. Proc. CLA 2010, Sevilla, Spain, pp. 60–69 (coauthor J. Konecny). [ISBN 978-84614-4027-6]

PROFESSIONAL ACTIVITIES

Membership

- Senior Member IEEE (Institute of Electrical & Electronics Engineers),
- Member ACM (Association for Computing Machinery),
- Member AMS (American Mathematical Society),
- Research Board of Advisors of the American Biographical Institute, Inc.,
- Scientific Board, Faculty of Science, Palacky University, Olomouc, Czech Republic (2004–2007),
- Scientific Board, Faculty of Electrical Engineering, Technical University of Ostrava, Czech Republic (2002–2006).
- Member of the Computer Science Panel, Czech Science Foundation (2009–2010, Chairman 2011–2012).

Editorial Work

- Member of Editorial Board of Int. Journal of General Systems (since 2000, Associate Editor since 2011),
- Member of Editorial Board of Journal of Computer and System Sciences, Associate Editor (since 2009),
- Member of Editorial Board of Fuzzy Sets and Systems, Area Editor for Algebra, (since 2010),
- Member of Editorial Board of Circuits and Systems (since 2010),
- Member of Editorial Board of Int. J. Uncertainty, Fuzziness and Knowledge-Based Systems, Area Editor (since 2011),
- 5 edited volumes.

Organization of Conferences

- Cofounder and Member of Steering Committee of CLA (Int. Conference on Concept Lattices and Their Applications),
- Program Chair of CLA 2005,
- Program Co-Chair of CLA 2008 (with S. Kuznetsov, Moscow, Russia),
- Program Committee Member of CLA 2002 (Horní Běčva, Czech Republic), CLA 2004 (Ostrava, , Czech Republic), CLA 2005 (Olomouc, Czech Republic), ICFCA 2006 (Dresden, Germany), ICCS 2006 (Aalborg, Denmark), Znalosti 2006 (Hradec Králové, Czech Republic), CLA 2006 (Tunis), AI 2006 (Hobart, Australia), EUSFLAT 2007, ICFCA 2007 (Clermont-Ferrand, France), ICCS 2007 (Sheffield, UK), Znalosti 2007 (Czech Republic), ACKE 2007 (Germany), CLA 2007 (France), ICFCA 2008 (Canada), ICCS 2008 (France), EMCSR 2008 (Vienna), IEEE Intelligent Systems 2008 (Bulgaria), NAFIPS 2008 (USA), CLA 2008 (Czech Republic), ICFCA 2009 (Germany), ICCS 2009 (Russia), NABIC 2009 (India), NAFIPS 2009 (USA), SoCPaR 2009 (Malaysia), Znalosti 2009 (Czech Republic), ICFCA 2010 (Morocco), CLA 2010 (Spain), ICCS 2010 (Malaysia), NAFIPS 2010 (Canada), Znalosti 2010 (Czech Republic), HAIS 2010 (Spain), MJCAI 2010 (Malaysia), SoCPaR 2010 (France), EUSFLAT 2011, ICFCA 2011, NAFIPS 2011 (USA), ICCS 2011, Znalosti 2011, CLA 2011 (France), ICFCA 2012 (Belgium), SMPS 2012 (Germany),

- Special Session “Relational Data Analysis” organizer and Vice-Chair of FUZZ-IEEE 2007 (London, UK),
- Systems Science Symposium at EMCSR 2008, 2010 Co-Organizer, Co-Chair of Symposium A,
- Special Session “Relational Data Analysis” organizer, IEEE Intelligent Systems (Varna, Bulgaria),
- Student Paper Chair, NAFIPS 2008 (New York, NY),
- Session Chair in many international conferences (ACM Symp. Applied Computing, IFSA, FUZZ IEEE, JCIS, CLA, and others).

Reviews

- Reviewer for: Ann. Pure and Appl. Logic, Discrete Mathematics, Discrete Applied Mathematics, IEEE Trans. Fuzzy Systems, Cognition, Computer Journal (Oxford University Press), Computer and Mathematics with Applications, IEEE Trans. Knowledge and Data Engineering, IEEE Trans. Systems, Man, and Cybernetics, Information Sciences, J. Applied Logic, Data and Knowledge Engineering, J. Logic and Computation, Computers and Math. Appl., Logic J. IGPL, Neural Computation, Neural Networks, Arch. Math. Logic, Fundamenta Informaticae, Int. J. General Systems, Journal of Advanced Comp. Intelligence, Fuzzy Sets and Systems, Int. J. Uncertainty, Fuzziness, and Knowledge-Based Systems, Soft Computing, Kybernetika, Int. J. Intelligent Systems, Neural Network World, Acta Math. et Inf. Univ. Ostrav., Intelligent Engin. Systems, Czech. Math. J., Tatra Mt. Math. Publ., Theoretical Computer Science.
- Reviewer for numerous conferences including: EUSFLAT 2007, IFSA 2003, IFSA 2005, FUZZ-IEEE 2005, FUZZ-IEEE 2007, CLA 2004, CLA 2005, CLA 2006, ICFCA 2006, ICFCA 2007, ICCS 2006, ICCS 2007, FCT 2007 (16th International Symposium on Fundamentals of Computation Theory, Hungary), WCCI 2008, IEEE Intelligent Systems 2008, ICCS 2008,
- Book reviews for journals (8-times).
- ACM SIGACT NEWS Volume 39, Number 3, BOOK REVIEW COLUMN (B. S. W. Schröder: Ordered Sets: An Introduction, Birkhäuser, 2003); SIAM Review.
- Reviews of grant applications (Czech Science Foundation, Czech Academy of Sciences, Department of Education of the Czech Republic).
- Reviews of numerous Ph.D. theses.

Invited talks

- Invited talks in numerous universities and institutions (TU Vienna, Austria; TU Darmstadt, Germany; State University of New York, Binghamton, NY; Czech Academy of Sciences; University of Ostrava; Technical University of Ostrava; University of Economics, Moscow; University of Blaise Pascal, Clermont-Ferrand, France; University of Malaga, Spain),
- Invited plenary talks in international conferences (Conference on Discrete Mathematics, Potsdam, Germany, 2001; Znalosti 2004, Czech Republic; ICFCA 2006, Dresden, Germany; invited tutorial in CLA 2006, Hammamet, Tunisia; JCIS 2007; IIASSRC 2008; LINZ 2010 - 31st Linz Seminar on Fuzzy Sets: “Lattice-Valued Logic and its Applications”, invited tutorial at CLA 2010, Seville, Spain; RSFDGrC 2011, Moscow, Russia; SFC 2011, Orleans, France).

TEACHING

Courses Taught

- Technical University of Ostrava, Czech Republic: Algorithms (1994–6, undergraduate), Mathematical Logic (1996–8, undergraduate), Relational Systems (1995–8, , undergraduate), Computability and Complexity (1998, graduate, development of this course), Neural Networks (1995–1998, graduate),
- Palacky University, Olomouc, Czech Republic: Mathematical Logic (2001–2006, undergraduate, development of this course), Information and Uncertainty (2001–2006, graduate, development of this course), Principles of Computer Science 1, 2 (2001–2006, graduate, development of this course), Fuzzy Logic (2001–present, Ph.D., development of this course), Formal Concept Analysis (2001–present, Ph.D., development of this course), Computability and Complexity (2001–present, Ph.D., development of this course), Soft Computing (2001–present, Ph.D., development of this course); Algorithmic mathematics 1, 2 (2010–present); Information Theory and Coding (2010–present); Algorithms and Complexity 2 (2011–present).
- Binghamton University—SUNY: SSIE 540 Relational Data Analysis; SSIE 517 Fuzzy Sets, Uncertainty, and Information; SSIE 640 Knowledge Discovery and Data Mining; SSIE 617 Fuzzy Sets, Fuzzy Logic, and Fuzzy Systems.

Development and Accreditation of Programs of Study

- Bc. Programs: Computer Science (development and accreditation, Palacky University, 2002), Applied Computer Science (development and accreditation, Palacky University, 2005),
- M.Sc. Programs: Computer Science (development and accreditation, Palacky University, 2002), Computer Science Teaching (development and accreditation, Palacky University, 2002),
- Ph.D. Programs: Computer Science (development, accreditation, Palacky University, 2008).

Supervision of Students

- M.Sc. Students: supervised about 20 M.Sc. theses,
- Ph.D. Students:
 - past
 - Vilém Vychodil (Palacky University, Mathematics, Ph.D. 2004),
 - Tařána Funiokov (Palacky University, Mathematics, Ph.D. 2006),
 - Jan Outrata (Palacky University, Mathematics, Ph.D. 2006),
 - Jiř Zacpal (Palacky University, Applied Mathematics, Ph.D. 2006),
 - Jiř Dvořk (Palacky University, Applied Mathematics, Ph.D. 2006),
 - Vladimr Sklenř (Palacky University, Mathematics, Ph.D. 2006),
 - Jan Konečny (Binghamton University–SUNY, Systems Science, Ph.D. 2009),
 - Eduard Bartl (Binghamton University–SUNY, Systems Science, Ph.D. 2009),
 - present
 - Petr Osička (Palacky University, Czech Republic, Computer Science), Juraj Macko (Palacky University, Czech Republic, Computer Science).

Service Related to Teaching

- Chair of State Examination Committees Appointed by Department of Education, Czech Republic,
- Member of State Examination Committees in Computer Science, Information Technology, Mathematics in several European universities.
- Comprehensive Revision of Systems Science Program at Binghamton University—SUNY.

Organization of Research Seminars

- Seminar on Information Science, Palacky University, Olomouc, Czech Republic (2002–2006, 2010–),
- Seminar on Information Science, Binghamton University—SUNY (2007–2009).