Decision Engineering

*Series Editor*

Dr Rajkumar Roy
Department of Enterprise Integration
School of Industrial and Manufacturing Science
Cranfield University
Cranfield
Bedford
MK43 0AL
UK

*Other titles published in this series*

*Cost Engineering in Practice*
John McIlwraith

*IPA – Concepts and Applications in Engineering*
Jerzy Pokojski

*Strategic Decision Making*
Navneet Bhushan and Kanwal Rai

*Product Lifecycle Management*
John Stark

*From Product Description to Cost: A Practical Approach*
*Volume 1: The Parametric Approach*
Pierre Foussier

*From Product Description to Cost: A Practical Approach*
*Volume 2: Building a Specific Model*
Pierre Foussier

*Decision-Making in Engineering Design*
Yotaro Hatamura

*Intelligent Decision-making Support Systems: Foundations, Applications and Challenges*
Jatinder N.D. Gupta, Guisseppi A. Forgionne and Manuel Mora
Publication due April 2006

*Metaheuristics: A comprehensive guide to the design and implementation of effective optimisation strategies*
Christian Prins, Marc Sevaux and Kenneth Sörensen
Publication due December 2006

*Context-aware Emotion-based Multi-agent Systems*
Rajiv Khosla, Nadia Bianchi-Berthouse, Mel Seigel and Toyoaki Nishida
Publication due July 2006

Mark Sh. Levin

# Composite Systems Decisions

With 126 Figures

Springer

Mark Sh. Levin, PhD
Institute for Information Transmission Problems
Russian Academy of Sciences
19 Bolshoj Karetny lane
Moscow 127994
Russia

British Library Cataloguing in Publication Data
Levin, M. Sh (Mark Shmuilovich), 1948-
Composite systems decisions. - (Decision engineering)
1. Systems engineering 2. Combinatorial optimization
I. Title
620'.0011
ISBN-10: 184628001X

Library of Congress Control Number: 2005935665

Decision Engineering Series ISSN 1619-5736
ISBN-10: 1-84628-001-X e-ISBN 1-84628-080-X Printed on acid-free paper
ISBN-13: 978-1-84628-001-6



Printed in Germany

9 8 7 6 5 4 3 2 1

Springer Science+Business Media
springer.com

The book is dedicated to colleagues

# Preface

Traditional *literacy* consists of two phases:

*Phase 1.* Basic literacy (*i.e.*, to read, to write, to account).

*Phase 2.* Computer literacy (*e.g.*, to work with computers, to write computer programs).

This book describes the research and educational direction called *Design of composite systems decisions*, which can be considered as an important part of *the third phase* of *literacy*. Let us consider the place and significance of our direction (*i.e.*, design of composite systems decisions). Design of composite systems decisions is a composite direction which implements *combinatorial (modular) synthesis*. This book focuses on composite decisions when a resultant decision consists of some interconnected parts (subdecisions, local decisions) and corresponds to a composite (composable, modular, decomposable) system. Our viewpoint is based on composition of the following: systems engineering and life-cycle engineering, computer science, applied mathematics and applied combinatorial optimization, and various application domains (*e.g.*, engineering, management, computer science, and social science). The material can be considered as the continuation of the author's monograph *Combinatorial Engineering of Decomposable Systems* (Kluwer, 1998) with the basic orientation to various application domains (engineering, information technology, management). The book consists of the four parts:

**Part I.** *Issues of Information Technology*, including information, specialists, solving frameworks. Evidently, this part involves *Decision-making Technology*, including problem analysis, problem structuring, evaluation of alternatives, selection of the best alternatives, and analysis of the results, *i.e.*, basic *paradigm of decision making* by H.A. Simon (*e.g.* [759, 762]). Note our direction extends traditional *decision making paradigm* by the special attention to generation (synthesis) of composite decisions on the basis of *hierarchical combinatorial synthesis*: (a) selection of the best local decisions and (b) composition of the local decisions into a resultant composite global decision. The efforts are based on *combinatorial engineering* and hierarchical morphological multicriteria design, which were proposed in recent years by the author (*e.g.* [494, 497]).

**Part II.** *Systems Approaches* (analysis, synthesis) and *systems engineering* are basic *active* generalized methodologies to describe/to model, to design, to redesign contemporary complex and multidisciplinary systems in engineering, management, social life, *etc.* Thus, we examine system modeling, analysis, synthesis and basic paradigms as a *product life cycle* and corresponding problems in *life-cycle engineering* (*e.g.*, design/management of life cycle). The following basic system *technological* problems are examined:

*1.* hierarchical combinatorial system modeling;
*2.* system design as a combinatorial synthesis of composite systems;
*3.* revelation of system bottlenecks;
*4.* redesign/improvement of a system;
*5.* multistage design of systems, trajectory design;
*6.* system evaluation; and
*7.* system evolution for composite systems.

Here, a special chapter is targeted to issues of system development/ evolution.

**Part III.** *Applied Systems Decisions* illustrates the usage of the abovementioned design approaches to *technological problems* in many domains: synthesis of software, evaluation and redesign of buildings, planning of medical treatment, design of a multistage immunoassay technology, *etc.* The applications described can be used as a set of basic analogues for future extension and improvement.

**Part IV.** *Educational Issues* is an additional crucial part of our direction and is targeted to three educational courses.

The book is oriented to applied researchers, students, and practitioners in many domains. Concurrently, the material will be of interest to various scientists (*e.g.*, mathematicians, computer scientists, economists, social engineers). The book can be used as a text for some courses (*e.g.*, systems engineering, system design, life-cycle engineering, engineering design, combinatorial synthesis) at the level of undergraduate (a compressed version), graduate/PhD levels and for continuing education. Note, special student team research projects can be included into educational plans. The student teams above can involve students of different professional domains. Further, the material will be useful for modular curriculum design.

The draft version of the book was written in Israel (Beer Sheva, Tel Aviv) in 2000–2004, and the final version was prepared in Moscow, Russia.

Moscow, *Mark Sh. Levin*
June 2005

# Acknowledgments

First, I am grateful for the permission to use (to reprint) materials from my published articles:

**1.** IEEE, permission in respect of the following article (for Chapters 3 and 7):

M.Sh. Levin, Modular System Synthesis: Example for Composite Packaged Software. *IEEE Trans. on SMC, Part C*, 35(4), 544–553, 2005.

**2.** Elsevier, permission in respect of the following articles (for Chapters 3, 11, and 12):

M.Sh. Levin, System Synthesis with Morphological Clique Problem: Fusion of Subsystem Evaluation Decisions. *Information Fusion*, 2(3), 225–237, 2001.

M.Sh. Levin, L. Sokolova, Hierarchical Combinatorial Planning of Medical Treatment, *Computer Methods and Programs in Biomedicine*, 73(1), 3–11, 2004.

M.Sh. Levin, M. Firer, Hierarchical Morphological Design of Immunoassay Technology, *Computers in Biology and Medicine*, 35(3), 229–245, 2005.

Second, I thank my colleagues (Moscow, 1970–1980) for their aid and collaboration in the multidisciplinary analysis and design of several applied engineering systems (a communication system, a control unit for a multi-radar system, software systems, management information systems, decision support systems). The names of the above-mentioned colleagues are: Eng. Victor F. Brilliantov, Eng. Valentin P. Chuvilin, Eng. Vyacheslav Yu. Demyanenko, Dr Vladimir M. Kisler, Eng. Tatjana Kleimenova, Eng. V. Kurnosov, Dr Rufina R. Naumova, Eng. Natalia Zalogina, Dr Yuri Zotov, Eng. Andrew Gilbershtein, Geologist Margarita S. Alferova-Temkina, Geologist Valery K. Burakov, Dr Vladimir Slavkin, Dr Alexander Rabinovish, Eng. Leonid Vainer, Eng. Alexander Berman, Technician Marina Kizim, Eng. Elena Vainer (Yazenko), Eng. Evgenia Chestnaya, Eng. Nina Sokolova (Martynova), and Technician Stas Bavrin.

Third, I am grateful to my colleagues for the joint formal/informal R & D projects (Russia, Israel, Canada; 1981–2003): Dr Moshe A. Danieli (Ariel, Israel), Dr Boris J. Feldman (Ramat Gan, Israel), Dr Vladimir I. Fershter (Moscow, Russia), Dr Michael A. Firer (Ariel, Israel), Dr Oleg P. Kudinov (Moscow, Russia), Dr Yuri L. Levine (Vienna, Austria), Eng. David B. Magidson (Moscow, Russia), Researcher Andrew A. Michailov (Moscow, Russia), Dr Mark L. Nisnevich (Ariel, Israel), Dr Vladimir I. Poroskoon (Moscow, Russia), Prof Ivan Rival (Ottawa, Canada), Eng. Elena P. Samsonova (Moscow, Russia), Prof Suresh Sethi (Torono, Canada), Prof Jeffrey Sidney (Ottawa, Canada), Dr Ludmila V. Sokolova (Moscow, Russia), and Prof Chelliah Sriskandarajah (Toronto, Canada).

Fourth, I acknowledge my scientific colleagues for many useful discussions on information technology, decision making, systems engineering, system modeling, and algorithm design and studies: Prof Fuad Aleskerov (Moscow, Russia), Prof Lev Bregman (Beer Sheva, Israel), Dr Pavel Chebotarev (Moscow, Russia), Prof Baruch Fischhoff (Pittsburg, USA), Dr Jane M. Furems (Moscow, Russia), Dr Alex Kreinin (Toronto, Canada), Prof Boris G. Mirkin (London, UK), Prof Ali Ngom (Ottawa, Canada), Prof Michael Drahlin (Ariel, Israel), Prof Brian Prasad (Pasadena, USA), Prof Alexander Razborov (Moscow, Russia), Prof Yoram Reich (Tel-Aviv, Israel), Prof Ilya M. Sobol (Moscow, Russia), Prof Roman B. Statnikov (Moscow, Russia and Monterey, USA), Dr Vadim G. Timkovsky (Toronto, Canada), and Prof Alek Vainstein (Haifa, Israel).

Fifth, I thank my relatives and friends for their attention and aid: Marina Bakhnov (Costa–Rica/USA), Valery Dikovsky (Israel), Jane M. Furems (Russia), Victor Gelman (USA), Rose Levin (Russia), Victor and Ira Levin (USA), Yuri and Natalia Levine (Austria), Esfir and George Leviten (USA), Jane and Michael Lozovsky (Russia), Ira Natapov (USA), Mark and Alla Neizvestny (Israel), Yuri and Ira Purinson (Israel), Alla and Valentin Rubenchik (Israel), and Boris and Luda Shmulyan (Israel).

Sixth, I am grateful to Kate Brown (Springer, London, UK), Andrea Koehler (LE-TeX, Leipzig, Germany), and Sorina Moosdorf (LE-TeX, Leipzig, Germany) for their valuable work in editing my manuscript.

# Contents

## Part II System Approaches

# References


1. Ackoff R.L. (1987) *The Art of Problem Solving Accompanied by Ackoff's Fables.* J. Wiley & Sons, New York
2. Ackoff R.L., Vergara E. (1981) Creativity in problem solving and planning: a review. *Eur. J. of Oper. Res.*, 7, 1–13
3. Abbod K.F., von Keyserlingk D.G., Linkens D.A., Mahfouf M. (2001) Survey on utilization of fuzzy technology in medicine and healthcare. *Fuzzy Sets and Syst.*, 120(2), 331–349
4. Abowd G.D., (1999) Classroom 2000: An experiment with the instrumentation of a living educational environment. *IBM Systems J.*, 38(4), 508–530
5. Abidi S.S.R. (2001) An intelligent tele-healthcare environment offering person-centered and wellness-maintenance services. *J. of Medical Syst.*, 25(3), 147–165
6. Adjiman C.S., Androulakis I.P., Floudas C.A. (2000) Global optimization of mixed-integer nonlinear problems, *AIChE Journal*, 46(9), 1769–1797
7. Adelson B., (1989) Cognitive research; uncovering how designers design; cognitive modeling: explaining and predicting how designers design. *Res. in Eng. Des.*, 1(1), 35–42
8. Adolfsson J., Ng A., Olofsgard P., Moore P., Pu J.S., Wong C.B. (2002) Design and simulation of component-based manufacturing machine systems. *Mechatronics*, 12(9-10), 1239–1258
9. Aga D.S. (ed) (1997) *Immunochemical Technology for Environmental Applications.* American Chemical Society
10. Agard B., Kusiak A. (2004) Data-mining-based methodology for the design of product family. *Int. J. of Prod. Res.*, 42(15), 2955–2969
11. Agarwal A., Davis J.T., Ward T. (2001) Supporting prdinal four-state classification decisions using neural networks. *Inform. Techn. and Manage.*, 2(1) 5-26
12. Agrawal P.K., Procopiuc C.M. (2002) Exact and approximation algorithms for clustering. *Algorithmica*, 33, 201–226
13. Aggarwal S. (1995) Emerging hard and soft technologies: current status, issues and implementation problems. *OMEGA*, 23(3), 323–339
14. Ahituv N., Igbaria M. (1988) A model to facilitate cost, pricing and budget of computer services. *Inform. & Manag.*, 14, 235–241
15. *AI EDAM, Special Issue on evolutionary design,* 13(3 and 5), 1999
16. Aikins J.S. (1983) Prototypical knowledge for expert systems. *Artificial Intelligence*, 20, 163–210
17. Aizerman M.A., Gusev L.A., Petrov S.V., Smirnov I.M. (1977) A dynamic approach to analysis of structured representatives as graphs (fundamentals of

graph dynamics). I. and II. *Automatika i Telemekhanika*, 7, 135–151, and 9, 123–136 (in Russian)
18. Akscyn R.M., McCracken D.L., Yoder E.A. (1988) KMS: a distributed hypermedia system for managing knowledge in organizations. *Comm. of the ACM*, 31(7), 820–825
19. Akutsu T., Halldorsson, M.M. (2000) On the approximation of largest common subtrees and largest common point sets. *Theor. Comp. Sci.*, 233(1-2), 33–50
20. Aleskerov F., Akin L., Altay G., Basaran B., Kurtul C., Iseri A., Toker A., Satir Ya. (2000) *Decision Support System for Disaster Management: Subsystem for Evaluation of Human Losses and Injuries under Different Earthquake Scenarios.* Technical Report (Research Paper) ISS/EC-00-06, Bogazici University, Departments of Economics, Computer Engineering, Civil Engineering, and Management, Istanbul
21. Alford M. (1985) SREM at the age of eight: the distributed computing design system. *Computer*, 18(4), 36–46
22. Alexandrov N.M., Husssaini M.Y. (eds) (1997) *Multidisciplinary Design Optimization: State of the Art (Proceedings in Applied Mathematics Series; no. 80).* SIAM, Providence
23. Allen P., Frost S. (1998) *Component-Based Development of Enterprise Systems.* Cambridge University Press, New York
24. Altshuller G.S. (1984) *Creativity as Exact Science. The Theory of the Solution of Inventive Problems.* Gordon and Breach, London
25. Amir A., Keselman D. (1997) Maximum agreement subtree of a set of evolutionary trees - metrics and efficient algorithms, *SIAM J. on Comp.*, 26(6), 1656–1669
26. Amon C.H., Finger S., Siewiorek D.P., Smailagic A. (1996) Integration of design education, research and practice at Carnegie Mellon University: a multidisciplinary course in wearable computer design. *J. of Engineering Education*, 85(4), 279–285
27. Anderberg M.R. (1973) *Cluster Analysis for Applications.* Academic Press, New York
28. Andersen C.J., Glassman M., McAfee R.B., Pinelli Th. (2001) An investigation of factors affecting how engineers and scietists seek information. *J. of Engineering and Technology Management*, 18(2), 131–155
29. Anderson J.R. (ed.), (1981) *Cognitive Skills and their Acquisition.* Erlbaum, Hillsdale, NJ
30. Anderson J.R. (1983) *The Architecture of Cognition.* Harvard Univiversity Press, Cambridge, MA
31. Anderson J.R. (1984) Cognitive psychology. *Artif. Intel.*, 23, 1–11
32. Anderson J.R. (1987) Skill acquisition: compilation of weak-method problem solutions. *Psychol. Review*, 94, 192–210
33. Angelov C., Melnik R.V.N., Buur J. (2003) The synergestic integration of mathematics, software engineering, and user-centered design: exploring new trends in education. *Future Generation Computer Systems*, 19(8) 1299–1307
34. Antonsson E.K., Cagan J. (eds) (2001) *Formal Engineering Design Synthesis.* Cambridge University Press, New York
35. Apperly H., Hoffman R., Latchem S., Maybank B., McGibbon B., Piper D., Simons C. (2003) *Service - and Component-based Development.* Addison-Wesley, Reading, MA
36. Araujo L., Harrison D. (2002) Path dependence, agency and technological evolution. *Technol. Analysis & Strategic Manag.*, 14(1) 5–19

37. Ariav G., Ginzberg M.J. (1985) DSS design: A systemic view of decision support. *Comm. of the ACM*, 28(10) 1045–1052
38. Arieh E. (1967) Seismicity of Israel and adjacent areas: Geological survey. *Israel Bulletin*, No. 43.
39. Arnold G., Reitherman R. (1982) *Building Configuration and Seismic Design.* J.Wiley & Sons, New York
40. Artale A., Franconi E., Guarino N., Pazzi L. (1996) Part-whole relations in object-centered systems: An overview. *Data and Knowledge Engineering*, 20(3), 347–383
41. Artobolevsky I.I. (1976) *Mechanisms in Modern Engineering Design*, Vol. 1. MIR Publishers, Moscow (the first edition in 1947)
42. Arts E.H.L., Lenstra J.K. (1997) *Local Search in Combinatorial Optimization.* J. Wiley & Sons, New York
43. Arthur J.D., Nance R.E., Balci O. (1993) Establishing software development process control: technical objectives, operational requirements, and the foundational framework. *J. Syst. Soft.*, 22(2), 117–128
44. Ashrafi N., Berman O. (1992) Optimization models for selection of programs. considering cost & reliability, *IEEE Trans. Reliability*, 41(2), 281–287
45. ASTM C33 (1997) *Specification for Concrete Aggregates.*
46. ASTM C330 (1997) *Standard Specification for Lightweight Concrete Aggregates for Structural Concrete.*
47. Austin S.A., Baldwin A.N., Newton A. (1996) A data flow model to plan and manage the building design process. *J. of Eng. Des.*, 7, 3–25
48. Austin S.A., Baldwin A.N., Li B., Waskett P. (1999) Analytical design planning technique: a model of the detailed building design process. *Design Studies*, 20(3), 279–296
49. Ayres R.U. (1969) *Technological Forecasting and Long-Time Planning.* McGraw-Hill, New York
50. Badawy M.K. (1995) *Developing Managerial Skills in Engineers and Scientists,* 2nd ed., J. Wiley & Sons, New York
51. Baglivo J.A., Graver J.E. (1983) *Incidence and Symmetry in Design and Architecture.* Cambridge University Press, Cambridge, UK
52. Bahill T.A., Alford M., Bharathan K., Clymer J.R., Dean D.L., Duke J., Hill G., LaBudde E.V., Taipale E.J., Wymore A.W. (1998) The design-methods comparison project, *IEEE Trans. SMC, Part C*, 28(1), 80–103
53. Bahill T.A., Gissing B. (1998) Re-evaluating systems engineering concepts using systems thinking, *IEEE Trans. SMC, Part C*, 28(4), 516–527
54. Baker B.S., Giancarlo R. (2002) Sparse dynamic programming for longest common subsequence from fragments, *J. of Algorithms*, 42(2), 231–254
55. Baker K.R., Magazine M.J., Nuttle H.L.W. (1986) The effect of commonality on safety stock in a simple inventory model. *Manag. Science,* 32(8), 982–988
56. Baldwin C.Y., Clark K.B. (2000) *Design Rules: The Power of Modularity.* MIT Press, Cambridge, MA
57. Baldwin A.N., Austin S.A., Hassan S.A., Thorpe T.M. (1999) Modelling information flow during the conceptual and schematic stages of building design. *Construction Manage. & Economics*, 17(2), 155–167
58. Baldwin R.A., Chung, M.J. (1995) Managing engineering data for complex products. *Res. in Eng. Des.*, 7(4), 215–231
59. Balic J., Abersek B. (1997) Model of an integrated intelligent design and manufacturing system. *J. of Intell. Manufact.,* 8(4), 263–270

60. Balinska K.T., Brightwell G.R., Quintas L.V. (1997) *Graphs whose vertices are graphs with bounded degree: distance problems.* Res. Report LSE-CDAM-97-05, Centre for Discrete and Applicable Mathematics, London School of Economics and Political Science, London
61. Ball M., Magazine M. (1981) The design and analysis of heuristics. *Networks*, 11(2), 215–219
62. Bar-Noy A., Dolev D. (1998) Families of consensus algorithms. In: Reif J.H. (ed) *VLSI Algorithms and Architectures, LNCS*, 319, Springer, pp. 380–390
63. Bard J.F., Feinberg A. (1989) Two-phase methodology for technology selection and system design. *IEEE Trans. Eng. Manag.,* 36(1), 28–36
64. Bard J.F., de Silva A., Bergevin A. (1997) Evaluating simulation software for postal service use: technique versus perception. *IEEE Trans. Eng. Manag.*, 44(1), 31–32
65. Barthelemy J.-P., Guenoche A. (1991) *Trees and Proximity Representation.* J. Wiley & Sons, Chichester
66. Bartholdi J.J., III, Platzman L.K. (1988) Heuristics based on spacefilling curves for combinatorial problems in Euclidean space. *Manag. Sci.*, 34(5), 291–305
67. Bartholdi, J.J., III, Platzman L.K. (1989) Spacefilling curves and the planar travelling salesman problem, *J. of the ACM*, 34(4), 719–737
68. Bartolozzi F., de Gaetano A., Di Lena E., Marino S., Nieddu L., Patrizi G. (2000) Operational research techniques in medical treatment and diagnosis: a review. *Eur. J. Oper. Res.*, 121(3), 435–466
69. Basili V.R., Musa J.D. (1991) The future engineering of software: a management perspective. *IEEE Computer*, 24(9), 90–96
70. Beam W.R., Palmer J.D., Sage P.A. (1987) Systems engineering for software productivity, *IEEE Trans. SMC*, 17(2), 90–96
71. Behrend S., Jasch C. (eds) (1997) *Life Cycle Design: A Manual for Small and Medium-Sized Enterprises.* Springer-Verlag, Berlin
72. Belacel N. (2000) Multicriteria assignment method PROAFTN: methodology and medical applications. *Eur. J. Oper. Res.*, 125(1), 175–183
73. Belacel N., Vincke Ph., Scheiff J.M., Boulassel M.R. (2001) Acute leukemia diagnosis aid using multicriteria fuzzy assignment methodology. *Computer Methods and Programs in Biomedicine*, 64(2) 145–151
74. Belkin A.R., Levin M.Sh. (1990) *Decision Making: Combinatorial Models of Information Approximation.* Nauka, Moscow (in Russian)
75. Ben-David A., Firer M.A. (1996) Immunoaffinity purification of monoclonal antibodies: in search of an alution buffer of general applicability. *Biotech. Techniques*, 10, 799–802
76. Ben-David A., Mandel J., (1995) Classification accuracy: machine learning vs explicit knowledge acquisition. *Machine Learning*, 18(1), 109–114
77. Bentley P.J. (ed) (1999) *Evolutionary Design by Computers.* Morgan Kaufmann Publishers, San Francisco, CA
78. Bentley P.J., Corne W. (eds) (2001) *Creative Evolutionary Systems.* Morgan Kaufmann Publishers, San Francisco, CA
79. Berge C. (1989) *Hypergraphs: Combinatorics of Finite Sets.* North Holland, Amsterdam
80. Berman O., Ashrafi N. (1993) Optimization models for reliability of modular software systems. *IEEE Trans. on Soft. Eng.*, 19(11), 1119–1123
81. Berman O., Zahedi F.M., Pemble K.R. (2001) A decision model and support system for the optimal design of health information networks. *IEEE Trans. SMC, Part C*, 31(2), 146–158

82. Bertero V.V. (1992) Seismic upgrading of existing structures. In: *Proc. of the 10th World Congress of Earthquake Engineering,* vol. 9, Madrid, pp. 5101–5106
83. Berzins V.A. (1998) Computer-aided software design & synthesis. *J. of Systems & Software*, 42(2) 165–176
84. Bhushan N., Rai K. (2004) *Strategic Decision Making. Applying the Analytic Hierarchy Process.* Springer, London
85. Bi Z.M., Zhang W.J. (2000) Modularity technology in manufacturing: taxonomy and issues. *Int. J. of Advanced Manufacturing Technology*, 18(5), 381–390
86. Bidgoli H. (1989) DSS products evaluation: an integrated framework, *J. Data Management*, November, 27–34
87. Birkinshaw J., Sheehan T. (2002) Managing the knowledge life cycle. *MIT Sloan Management Review*, 44(1), 75–83
88. Blackman S.S. (1986) *Multiple-Target Tracking with Radar Applications*, Artech House, Boston
89. Blanchard B.S., Fabrycky W.J. (1998) *Systems Engineering and Analysis.* Prentice Hall, Englewood Cliffs, NJ
90. Blazewicz J., Ecker K.H., Schmidt G., Weglarz J. (1994) *Scheduling in Computer and Manufacturing Systems*, 2nd ed. Springer, Berlin
91. Blin M.-J., Tsoukias A. (2001) Multicriteria methodology contribution to software quality evaluation. *Software Quality Journal*, 9, 113–132
92. Bloch I., Hunter A. (eds) (2001) Special issues on data and knowledge fusion, *Int. J. of Intell. Syst.*, 16(10–11)
93. Boehm B.W., Brown J.R., Kaspar H., Lipow M., MacLeod G.J., Merrit M.J. (1978) *Characteristics of Software Quality.* TWR Systems and Energy, Inc. Redondo Beach, Ca / North-Holland, Amsterdam
94. Bogart K.P. (1973) Preference structures I: distance between transitive preference relations. *J. Math. Soc.*, 3, 49–67
95. Bondalapati K., Prasanna V.K. (2002) Reconfigurable computing systems. *Proc. of the IEEE*, 90(7) 1201–1217
96. Booch G. (1991) *Object Oriented Development.* The Benjamin/Cummings Publishing Company, Redwood City, CA
97. Boose J.H. (1989) A survey of knowledge acquisition techniques and tools. *Knowledge Acquisition*, 1, 3–37
98. Boose J.H., Gaines B.R. (1988) *Knowledge Acquisition Tools for Expert Systems.* Academic Press, San Diego, CA
99. Botafogo R.A., Rivlin E., Shneiderman B. (1992) Structural analysis of hypertexts: identifying hierarchies and useful metrics. *ACM Trans. Inform. Syst.*, 10(2), 142-180
100. Bournaud I., Ganascia J.-G. (1995) Conceptual clustering of complex objects: A generalization space based approach. In: *Proc. of the Third Intl. Conf. on Conceptual Structures*, LNAI 954. Springer, Berlin, pp. 173–187
101. Bournaud I., Ganascia J.-G. (1997) Accounting for domain knowledge in the construction of a generalization space. In: *Conceptual Structures: Fulfilling Peirce's Dream*, Lukose D., Delugach H., Kecler M., Searle L., Sowa J. (eds), LNAI 1257. Springer-Verlag, Berlin, pp. 446–459
102. Braha D. (2001) Design-as-satisfiability: a new approach to automated synthesis. *AI EDAM*, 15(5), 385–399
103. Braha D., Maimon O. (1998) *A Mathematical Theory of Design: Foundations, Algorithms and Applications.* Kluwer Academic Publishers, Dordrecht
104. Brans J.P., Vincke P., Mareschal B. (1986) How to select and how to rank projects: The PROMETHEE method. *Eur. J. of Oper. Res.*, 24(2), 228–238

105. Brodio C.B., and Hayes C.C. (2002) DAISY: a decision support design methodology for complex, experience-centered domains. *IEEE Trans. Syst., Man, Cybern., Part A*, 32(1) 50–71
106. Brodie M., Rish I., Ma S. (2002) Intelligent probing: a cost-effective approach to fault diagnosis in computer networks. *IBM Systems J.*, 41(3), 372–385
107. Brooking A. (1996) *Intellectual Capital: Core Asset for the Third Millennium Enterprise*. Int. Thompson Business Press, London
108. Brooks F.P., Jr. (1995) *The Mythical Man-Month. Essays on Software Engineering*. Addison-Wesley, Reading, MA
109. Brown A. (2000) *Large-scale Component-based Development*. Prentice Hall, Englewood Cliffs, NJ
110. Brown D.C. (1998) Defining configuring. *AI EDAM*, 12, 301–305
111. Brown D.C., Chandrasekaran B. (1989) *Design Problem Solving: Structures and Control Strategies*. Pitman Publishing, London, UK
112. Brown D.E., Scherer W.T. (2000) A comparison of systems enginering programs in the United States. *IEEE Trans. SMC - Part C*, 30(2), 204–212
113. Brown K. (1997) Grammatical design. *IEEE Expert*, 12(2), 27–33
114. Bruno G., Agarwal R. (1997) Modeling the enterprise engineering environment. *IEEE Trans. on Eng. Manag.*, 44(1), 20–30
115. BS 3797 (1990) *Specification for Lightweight Aggregates for Masonry Units and Structural Concrete*.
116. Budde R., Kantz K., Kuhlenkamp K., Zullighoven H. (1991) *Prototyping. An Approach to Evolutionary System Development*. Springer, Berlin
117. Budnitz R.J., Apostolakis G., Boore D.M., Cluff L.S., Coppersmith K.J., Cornell C.A., Morris P.A. (1998) Use of technical expert panels: applications to probabilistic seismic hazard analysis. *Risk Analysis*, 18(4), 463–470
118. Buede D.M. (1992) Software review: overview of the MCDA software market *J. of Multi-Criteria Decision Analysis*, 1(1), 59–61
119. Buede D.M. (1999) *The Engineering Design of Systems*. J. Wiley & Sons, New York
120. Buede D.M., Choisser R.W. (1992) Providing and analytical structure for key system choices. *J. of Multi-Criteria Decision Analysis*, 1(1), 17–27
121. Bui T.X. (1987) *Co-oP: A Group Decision Support System for Cooperative Multiple Criteria Group Decision Making*, LNCS 290. Springer, New York
122. Bui T.X., Shakun M.F. (1996) Negotiation processes, evolutionary systems design, and NEGOTIATOR, *Group Decision and Negotiation,* 5(4-6), 339–353
123. *Building Construction under Seismic Conditions in the Balkan Region* (1993) UNDP/UNIDO PEP/79/015, Vols. 1-7, Vienna
124. Bunch D.S., Rocke D.M., Harrison R.O. (1993) Statistical design of ELISA protocols. *J. of Immunological Meth.* 132, 247–254
125. Bunke H. (1997) On a relation between graph edit distance and maximum common subgraph. *Pattern Recogn. Lett.*, 18(8), 689–694
126. Bunke H., Shearer K. (1998) A graph distance metric based on the maximal common subgraph. *Pattern Recogn. Lett.*, 19(3-4), 255–259
127. Burke E., Hart E., Kendall G., Ross P., Schulenburg S. (2003) Hyperheuristics: a emerging direction in modern search technology. In: Glover F. (ed) *Handbook of Meta-Heuristics*, Kluwer Academic Publishers, pp. 457–474
128. Camarinha-Matos L.M., Afsarmanesh H., Garita C., Lima C. (1998) Towards and architecture for virtual enterprises. *J. of Intell. Manufact.*, 9(2), 189–199
129. Cameron J. (1989) *JSP & JSD: The Jackson Approach to Software Development*, 2nd ed. IEEE Computer Society Press, Washington

130. Campbell J.D., Jadine A.K.S. (eds) (2001) *Maintenance Excellence. Optimizing Equipment Life-Cycle Decisions.* Marcel Dekker, New York
131. Campbell J., Murtagh F., Kokuer M. (2001) DataLab-J: a signal and image processing laboratory for teaching and research. *IEEE Trans. Education*, 44(4), 329–335
132. Card D.N. (1990) Software quality engineering. *Inform. & Software Techn.*, 32(1), 3–10
133. Card D.N., McCarry, F.E., Page G.T. (1987) Evaluating software engineering technologies. *IEEE Trans. Soft. Eng.*, 13(7), 845–851
134. Carson E.R., Cramp D.G., Morgan A., Roudsari A.V. (1998) Clinical decision support, systems methodology, and telemedicine: their role in the management of chronic disease. *IEEE Trans. on Inform. Technology and Biomedicine*, 2, 80–88
135. Catty D. (ed.) (1989) *Antibodies: A practical approach.* Vol. II. Oxford University Press, Oxford (chapters 3,4, and 5)
136. Chakrabarti A. (2001) Improving efficiency of procedures for compositional synthesis by using bidirectional search. *Artif. Intell. in Eng. Des.*, 15(1) 67–80
137. Chakrabarti A. (ed) (2001) *Engineering Design Synthesis.* Springer, Berlin
138. Chakravarty A.K., Balakrishnan N. (2001) Achieving product variety through optimal choice of module variations. *IEE Trans.* 33(7) 587–598
139. Chan D. (ed) (1992) *Immunoassay Automation.* Academic Press, New York
140. Chandrasekaran B. (1983) Towards taxonomy of problem solving types. *AI Magazine*, 4(1), 9–17
141. Chandrasekaran B. (1990). Design problem solving: a task analysis. *AI Magazine*, 11(4), 59–71
142. Chandrasekaran B., Josephson J.R., Benjamins V.R. (1998) Ontology of tasks and methods. Presentation at *The 1998 Banff Knowledge Acquisition Workshop*, //www.cis.ohio-state.edu/lair/
143. Chandrasekaran B., Johnson T.R., Smith J.W. (1992) Task-structure analysis for knowledge modeling. *Comm. of the ACM*, 33(9), 124–136
144. Chantler M.J., Coghill G.M., Shen O., Leitch R.R. (1998) Selecting tools and techniques for model-based diagnosis. *Adv. Eng. Informatics*, 12(1–2), 81–98
145. Chao C.J., Cheng F.P. (1996) A fuzzy diagnostic model for diagnosis cracks in reinforced concrete structures. *Microcomputers in Civil Eng.*, 11, 115–122
146. Chapin N., Hale J.E., Khan K.M., Ramil J.F., Tan W.G. (2001) Types of software evolution and software maintenance. *J. of Software Maintenance and Evolution: Research and Practice*, 13(1), 1–30
147. Chapman W.L., Bahill A.T., Wymore A.W. (1992) *Engineering Modeling and Design.* CRC Press, Boca Raton, FL
148. Charnes A., Cooper W.W., Lewin A.Y., Seiford L.M. (1995) *Data Envelopment Analysis: Theory, Methodology, and Application.* Kluwer Academic Publishers, Boston
149. Chatters B.W., Lehman M.M., Ramil J.F., Wernick P. (2000) Modelling a long term software evolution process. *J. of Software Process: Improvement and Practice*, 5(2/3), 91–102
150. Chen C., (2003) *Mapping Scientific Frontiers. The Quest for Knowledge Visualization.* Springer, New York
151. Chen C.-H., Occena L.G. (2000) Knowledge decomposition for a product design blackboard expert system, *Artif. Intel. in Eng.*, 14, 71–82
152. Chen C.-H., Wu T., Occena L.G. (2002) Knowledge organization of product design blackboard systems via graph decomposition, *Knowledge-based Syst.*, 15(7), 423–425

153. Chen K.-Z. (1999) The relationship among design methods: Key to successful applications and developments of design methods. *J. of Eng. Des.*, 10(2), 125–141
154. Chen S.-M. (1997) Interval-valued fuzzy hypergraph and fuzzy partition. *IEEE Trans. SMC, Part B*, 27(4), 725–732
155. Chen H., Schatz B., Hg T., Martinez J., Kirchhoff A., Lin C. (1996) A parallel computing approach to creating engineering concept spaces for semantic retrieval: the Illinois Digital Library Initiative Project. *IEEE Trans. PAMI*, 18(8), 771–782
156. Chen J., Patton R.J. (1998) *Robust Model-Based Fault Diagnosis for Dynamic Systems.* Kluwer Academic Publishers, Dordrecht
157. Chen L.-C., Lin L. (2002) Optimization of product configuration design using functional requirements and constraints. *Res. in Eng. Des.*, 13(3), 167–182
158. Cheng F.Y., Wang Y.Y. (eds.) (1996) *Post-Earthquake Rehabilitation and Reconstruction.* Pergamon Press, New York
159. Chew G., Shnedier M., Kandel A. (1993) Use of object-oriented structures to represent knowledge in expert systems. In: *Proc. of the 1993 ACM/SIGAPP Symp. on Applied Computing: State of the Art and Practice*, pp. 498–503
160. Chew L.P., Kedem K., Huttenlocher D.P., Kleinberg J. (1999) Fast detection of geometric substructure in protein. *J. of Comput. Biology*, 6(3–4), 313–325
161. Chianglin C.-Y, Chen J.-S., Yu P.L. (2004) Transforming from researcher into a leader in high-tech industries. *Int. J. of Information Technology and Decision Making*, 3(3), 379–393
162. Chipman S., Meyrowitz A.L. (eds) (1993) *Foundations of Knowledge Acquisition: Cognitive Models of Complex Learning.* Kluwer Academic Publishers, Dordrecht
163. Chittaro L. (2001) Information visualization and its application to medicine. *Artif. Intell. in Medicine* 22(2) 81–88
164. Cho J.H., Cho M.W., Kim, M.K. (2001) Computer aided design, manufacturing and inspection system integration for optical lens production. *Int. J. Prod. Res.* 40(16) 4271–4283
165. Choo C.W. (1998) *The Knowing Organization.* Oxford University Press, New York
166. Cios K.J., Kacpazyk J. (eds) (2001) *Medical Data Mining and Knowledge Discovery.* Physica Verlag, Berlin
167. Cleary S. (2002) Restricted rotation distance between binary trees. *Inform. Process. Lett.*, 84(6), 333–338
168. Coello Coello C.A. (1995) A comprehensive survey of evolutionary-based multiobjective optimization techniques. *Knowledge and Inform. Syst.,* 1(3), 269–308
169. Coello Coello, C.A., Christiansen A.D. (1999). MOSES: a multiobjective optimization tool for engineering design. *Engin. Optim.*, 31(3), 1337–1368
170. Cohen F., Guitfoyle C. (1987) Explore smalltalk and OPS. *Expert Syst. User*, 2(11), 10–11
171. Colbourn C.J. (1987) *The Combinatorics of Network Reliability.* Oxford University Press, Oxford
172. Collette Y., Siarry P. (2004) *Multiobjective Optimization. Principles and Case Studies.* Springer, London
173. Collier D.A. (1981) The measurement and operating benefits of component part commonality. *Decision Sciences*, 12(1), 85–96
174. Compton K., Hauck S. (2002) Reconfigurable computing: a survey of systems and software. *ACM Comput. Sur.*, 34(2) 171–210

175. Conant R.C. (1974) Information flows in hierarchical systems. *Intl. J. of General Syst.*, 1(1), 9–18
176. Conklin J. (1987) Hypertext: an introduction and survey. *IEEE Computer*, 20(9), 17–41
177. Conradi R. (ed.) (1997) *Software Configuration*, LNCS 1235. Springer, Berlin
178. Conradi R., Westfechtel B. (1998) Version models for software configuration management. *ACM Comput. Surveys*, 30(2), 232–282
179. Cook W.D., Kress M. (1992) *Ordinal Information and Preference Structures: Decision Models and Applications.* Prentice Hall, Englewood Cliffs, NJ
180. Cook W.D., Johnson D.A., Kress M. (1993) Selecting a new technology strategy using multiattribute, multilevel decision trees. *J. of Multi-Criteria Decision Analysis*, 2, 129–144
181. Cooper W.W., Seiford L.M., Tone K. (1999) *Data Envelopment Analysis – A Comprehensive Text with Models, Application, References.* Kluwer Academic Publishers, Boston
182. Cordero R. (1999) Developing the knowledge and skills of R & D professionals to achieve process outcomes in cross-functional teams. *The J. of High Techn. Manag. Res.*, 10(1), 61–78
183. Craig T.K., George J.F. (2002) Improving software inspections with group process support. *Comm. of the ACM*, 45(9) 87–92
184. Cramp D.G., Carson E.R. (2000) A modeling framework for health care system management, design and evaluation. In: *Proc. 15th Eur. Meeting on Cybern. and Syst. Res.*, 1, pp. 377–382
185. Creer T.L. (2001) Asthma, disease management, and research: attempting to unravel a Gordian knot. *J. of Asthma*, 38(4), 289–297
186. Crnkovic I., Larson M. (2002) Challenges of component-based development. *J. of Syst. and Soft.*, 61(3) 201–212
187. Cross J.M. (2002) *Fundamentals of Preventive Maintenance.* American Management Association
188. Cross N. (1985) Styles of learning, designing and computing. *Design Studies*, 6(3), 157–162
189. Cross N. (1998) Skills of expertise in engineering designers. *Res. in Eng. Des.,* 10(3), 141–149
190. Culik II K., Wood D. (1982) A note on some tree similarity measures. *Inform. Process. Lett.*, 15(1), 39–42
191. Da Silveira G.J.C. (2002) Improvement trajectories in operations and technology management: concepts, process and content issues. *Technol. Analysis & Strategic Manag.*, 14(2), 227–240
192. Dahmus J., Gonzalez-Zugasti J.P., Otto K.N. (2001) Modular product architecture. *Design Studies*, 22(5), 409–424.
193. Darr T., Klein M., McGuinness D.L. (eds) (1998) Special issue on configuration design. *AI EDAM,* 12(4), 293–294
194. Dasarthy B.V. (1994) *Decision Fusion.* IEEE Computer Society Press, Los Alamitos
195. Dasarthy B.V. (ed.) (1995) Special section on information fusion, *Optical Engineering*, 35(3)
196. Daskin M.S. (1995) *Networks and Discrete Location. Models, Algorithms, and Applications.* J. Wiley & Sons, New York
197. Davidovici V. (1993) Strengthening of existing buildings. In: *17th Eur. Seminar on Earthquake Eng.*, Israel, Haifa, pp. 389–415
198. Davis G. (1982) Strategies for information requirements determination. *IBM Syst. J.*, 21(1), 4–30

199. Davis C.C., Smolyaninov I.I., Milner S.D., (2003) Flexible optical wireless links and networks. *IEEE Communications Magazine*, 41(3), 51–57
200. De Lit P.G., Delchambre A., Henrioud J.-M. (2003) An integrated approach to product family and assembly system design. *IEEE Trans. on Robotics and Automation*, 19(2), 324–334
201. Dean P.M. (ed) (1994) *Molecular Similarity in Drug Design*, Kluwer Academic Publishers, Dordrecht
202. Deb K. (2001) *Multiobjective Optimization Using Evolutionary Algorithms*. J. Wiley & Sons, New York
203. Debevc M., Donlagic D., Svecko R., Spasovski S., Meyer B. (1994) Flexible user support with adaptive bar. In: *Proc. of Intl. Conf. on Human Computer Interaction EWHCI'94*, St. Petersburg, Vol. 1, pp. 129–134
204. Degood D.E., Crawford A.L., Jongsma Jr. A.E. (1999) *The Behavioral Medical Treatment Planner*. J. Wiley & Sons, New York
205. DeMarco T. (1979) *Structured Analysis and System Specification*. Prentice-Hall, Englewood Cliffs, NJ
206. Demes G.H., Fenves S.J., Grossmann I.E., Hendrickson C.T., Mitchell T.M., Prinz F.B., Sewiorek D.P., Subrahmanian E., Talukdar S., Westerberg A.W. (1993) The Engineering Design Research Center of Carnegie Mellon University. *Proc. of the IEEE*, 81(1), 10–23
207. Denning P.J. (2002) The profession of IT. Career redux. *Comm. of the ACM*, 45(9) 21–26
208. Deshayes P.J., Thissen W.A.H. (eds) (2000) Special issue on systems engineering education. *IEEE Trans. SMC, Part C*, 30(2) 161–163
209. Dixon J.R. (1966) *Design Engineering: Inventiveness, Analysis and Decision Making*. McGraw-Hill, New York
210. Dixon J.R. (1987) On research methodology towards a scientific theory of engineering design. *AI EDAM*, 1(3), 145–157
211. Dixon L.A., Colton J.S. (1998) An anchoring adjustment process model for redesign. *J. of Eng. Des.*, 9(4), 297–314
212. Dixon L.A., Colton J.S. (2000) A process management strategy for re-design: an anchoring adjustment approach. *J. of Eng. Des.*, 11(2), 159–174
213. Dobrescu G., Reich Y. (2003) Progressive sharing of modules among product variants. *Computer-Aided Design*, 35(9), 791–806
214. Dolk D.B., Konsynski B.R. (1984) Knowledge representation for model management systems. *IEEE Trans. on SMC*, 10(6), 619–628
215. Dominguez-Ballesteros B., Mitra G., Lucas C. Koutsoukis M.-S. (2002) Modeling and solving environments for mathematical programming (MP): a status review and new directions. *J. of the Oper. Res. Soc.*, 53(10), 1072–1092
216. Dosi G. (1982). Technological paradigms and technological trajectories: a suggested interpretation of the determinants and directions of technological change. *Research Policy*, 11(3) 147–162.
217. Du D.-Z., Pardalos P.M., Wang J. (eds) (2000) *Discrete Mathematical Problems With Medical Applications*, Dimacs Workshop, AMS, Providence
218. Du X., Jiao J., Tseng M.M. (2001) Architecture for product family. *Concurrent Eng.: Res. and Appl.*, 9(4), 309–325
219. Du X., Jiao J., Tseng M.M. (2002) Product platform modeling and design support: an approach based on graph rewriting systems. *AI EDAM*, 16(2), 103–120
220. Du Bois Ph., Brans J.P., Cantraine F., Mareschal B. (1989) MEDICS: an expert system for computer-aided diagnosis using the PROMETHEE multicriteria method. *Eur. J. Oper. Res.*, 39, 284–292

221. Duma G. (ed) (1994) *Earthquake Engineering: Proc. of the 10th Eur. Conf.,* Vienna
222. Dym C.L. (1994) *Engineering Design - A Synthesis of Views.* Cambridge University Press, Cambridge
223. Dym C.L. (1998) Design and design centers in engineering education. *AI EDAM,* 12, 43–46
224. Dym C.L. (1999) Learning engineering: design, languages, and experience. *J. of Eng. Education,* 88(2), 145–148
225. Dym C.L. (2004) Design, systems, and engineering education. *Int. J. of Eng. Education,* 20(3), 305–312
226. Dym C.L., Agogino A.M., Eris O., Frey D.D., Leifer L.J. (2005) Engineering design thinking, teaching, and learning. *J. of Engineering Education*, 94(1), 103–120
227. Eastman C.M., Bond A.H., Chase S.C. (1991) Application and evaluation of an engineering data model. *Res. in Eng. Des.*, 2(4), 185–207
228. Edvinsson L., Malone M. (1997) *Intellectual Capital.* Harper, New York
229. Edwards K.L. (1993) Improved design through guidelines support. *Eng. Designer*, 19(5), 22–23
230. Egenhofer M.J., Shariff A.R.B.M. (1998) Metric details for natural-language spatial relations. *ACM Trans. Inform. Syst.*, 16(4), 295–321
231. Egghe L., Michel C. (2002) Strong similarity measures for ordered sets of documents in information retrieval, *Inform. Proc. & Manag.*, 38(6), 823–848
232. El-Kwae E.A., Kabuka M.R. (2000) Efficient content-based indexing of large image databases. *ACM Trans. Inform. Syst.*, 18(2), 171–219
233. Elnashai A.S. (2002) A very brief history of earthquake engineering with emphasis on developments in and from the British Isles. *Chaos, Solutions and Fractals*, 13(5), 967–972
234. Ericsson A., Erixon G. (2000) *Controlling Design Variants: Modular Product Platforms.* ASME Press, New York
235. Ershov A.P. (1972) Aesthetics and human factor in programming. *Comm. of the ACM*, 15(7), 501–505
236. Eschenauer H.A. (1991) Structural optimization – a need in design process? In: Eschenauer H.A., Mattheck C., Olhoff N. (eds) *Engineering Optimization in Design Process*, Lecture Notes in Engineering 63, Springer, Berlin, pp. 1–13
237. Ethiraj S.K., Levinthal D. (2004) Modularity and innovation in complex systems. *Manag. Science* 50(2) 159–173
238. Fagin R., Halpern J.Y., Vardi M.Y. (1991) A model-theoretic analysis of knowledge. *J. of the ACM*, 91(2), 382–428
239. Fagin R., Geanakoplos J., Halpern J.Y., Vardi M.Y. (1992) The expressive power of the hierarchical approach to modeling knowledge and common knowledge. In: *Proc. of Fourth Conf. on Theoretical Aspects of Reasoning about Knowledge*, pp. 229–244
240. Fahlman S.E. (1979) *NETL: A System for Representing and Using Real-World Knowledge.* MIT Press, Cambridge, MA
241. Farach M., Thorup M. (1997) Sparse dynamic programming for evolutionary tree comparison. *SIAM J. on Computing*, 26(1), 210–230
242. Farn K.-J., Lo D.-H. (1992) A method for selection of enterprise information system based on the combination of the analytic hierarchy process and the information system management planning. In: *Proc. of 10th Int. Conf. on MCDM*, vol. III, Taiwan, pp. 221–236
243. Fayad M., Cline M.P. (1996) Aspects of software adaptability. *Comm. of the ACM*, 39(10), 58–59

244. Fedorovicz J., Williams G.B. (1986) Representing modeling knowledge in an intelligent decision support system. *Decision Support Syst.*, 2(1), 3–14
245. Fedra K., Zhao C., Winkelbauer L. (1993) Interactive multicriteria decision support: combining rule-based and numerical approaches. In: Wessels J., Wierzbicki A.P. (eds) *User-Oriented Methodology and Techniques of Decision Analysis and Support.* Lecture Notes in Economics and Mathematical Systems, Vol. 397. Springer, Vienna, pp. 48–64
246. Feiler P.H. (1991) *Configuration management models in commercial environment.* TR CMU/SEI-91-TR-7, Software Engineering Inst., CMU, PA
247. Feiler P.H. (ed) (1991) *Proc. of the 3rd Int. Workshop on Software Configuration Management*, Norway. ACM Press, New York
248. FEMA172 (1992) *NEHRP Handbook of Techniques for the Seismic Rehabilitation of Existing Buildings.* Building Seismic Safety Council for the Federal Emergency Management Agency, Washington, DC
249. FEMA273 (1997) *BSSC NEHRP Guidelines for the Seismic Rehabilitation of Buildings.* Building Seismic Safety Council for the Federal Emergency Management Agency, Washington, DC
250. Fensel D. (2000) *Ontologies: Silver Bullet for Knowledge Management and Electronic Commerce.* Springer, Berlin
251. Fensel D., Angele J., Studer R. (1998) The knowledge acquiaition and representation language KARL. *IEEE Trans. KDE*, 10(4), 527–550
252. Fenton N., Pfleeger S. (1997) *Software Metrics: A Rigorous and Practical Approach.* PWS Publishing, Boston
253. Finden C.R., Gordon A.D. (1985) Obtaining common pruned trees. *J. of Classification*, 2, 255–276
254. Finger S., Dixon J.R. (1989) A review of research in mechanical engineering design. Part II: representations, analysis, and design for the life-cycle. *Res. in Eng. Des.*, 1, 121–137
255. Finkelstein A. (1996) Requirements engineering research: coordination and infrastructure. *Requirements Engineering*, 1(1), 63–69
256. Finney D.J. (1978) *Statistical Methods in Biological Assay,* 3rd ed. Griffin High Wycombe, Bucks
257. Finnie G.R., Wittig G.E., Petkov D.I. (1993) Prioritizing software development productivity factors using the analytic hierarchy process. *J. Syst. Soft.*, 22(2), 129–139
258. Firer M.A., Hosking C.S., Hill D.J. (1981) Milk-specific antibody measurement by ELISA: development of an assay. *J. of Immunological Meth.*, 46, 31–40
259. Firer M.A., Krozman T., Shoenfeld Y., Slor H. (1991) Assessment of temperature and coating conditions on the measurements of antibodies to cardiolipin. *J. of Immunological Meth.*, 143, 31–39
260. Fischer G., Makowski M., Antoine J. (1996) *Multiple criteria land use analysis.* Working paper WP-96-006, International Institute for Applied Systems Analysis, Austria, Laxenburg
261. Fishburn P.C. (1970) *Utility Theory for Decision Making.* J. Wiley & Sons, New York
262. Fishman G.S. (1996) *Monte Carlo: Concepts, Algorithms, and Applications.* 2nd ed. Springer, New York
263. Fiskas S., Helm B.R. (1992) Knowledge representation and reasoning in the design of composite systems. *IEEE Trans. on Software Engineering*, 18(6), 470–482
264. Fleischanderl G., Friedrich G.E., Haselbock A., Schreiner H., Stumptner M. (1998) Configuring large systems using generative constraint satisfaction. *IEEE Expert*, 13(4), 59–68

265. Fletcher M., Brennan R.W., Norrie D.H. (2003) Modeling and reconfiguring intelligent holonic manufacturing systems with Internet-based agents. *J. of Intell. Manufact.*, 14(1), 7–23
266. Flood I., Gagarin N., Kartam N. (1998) Modelling earthquake accelerogramms using neural networks and linear predictors. *AI EDAM*, 12(3), 243–258
267. Floudas C.A. (1995) *Nonlinear and Mixed-Integer Optimization: Fundamentals and Applications (Topics in Chemical Engineering).* Oxford University Press, New York
268. Floudas C.A., Pardalos P. (eds) (1996) *State of the Art in Global Optimization: Computational Methods and Applications.* Kluwer Academic Publishers, Boston
269. Floudas C.A. (1999) *Deterministic Global Optimization.* Kluwer Academic Publishers, Boston
270. Fogel D.B. (2000) What is evolutionary computation? *IEEE Spectrum,* 37(2), 26–32
271. Fogliatto F.S., Albin S.L. (2001) A hierarchical method for evaluation products with quantitative and sensory characteristics. *IEE Trans.*, 33(12), 1081–1092
272. Fonseca C.M., Fleming P.J. (1995) An overview of evolutionary algorithms for multiobjective optimization. *Evolutionary Computation,* 3(1), 1–16
273. Ford G. (1996) *The SEI Undergraduate Curriculum in Software Engineering.* Software Engineering Institute, CMU, Pennsylvania
274. Forgionne G.A. (1991) Decision technology system: a vehicle to consolidate decision making support. *Inform. Process. & Manag.*, 27(6), 679–697
275. Forrester J.W. (1994) System dynamics, systems thinking, and soft OR. *System Dynamics Review*, 10, 2–3
276. Fox J., Johns N., Rahmanzadeh A. (1998) Disseminating medical knowledge: the PROforma approach. *Artif. Intell. in Medicine*, 14, 157–181
277. French M. (1994) *Invention and Evolution. Design in Nature and Engineering.* 2nd ed., Cambridge University Press, Cambridge
278. Furems J.M., Gnedenko L.S. (1992) STEPCLASS – technique and system for knowledge acquisition. In: *Proc. of 10th Int. Conf. on Multiple Criteria Decision Making.* Taiwan, 4, pp. 225–232
279. Gabriel K.J. (1998) Scanning the technology. In: *Proc. of the IEEE*, 86(8), 1534–1535
280. Gallopoulos E., Houstis N.E., Rice J.R. (1995) Workshop on problem-solving enviroments: findings and recommendations. *ACM Comput. Surveys,* 27(2), 277–279
281. Garey M.R., Johnson D.S. (1979) *Computers and Intractability. The Guide to the Theory of NP-Completeness.* W.H.Freeman and Company, San Francisco
282. Garlan D., Krueger C.W., Lerner B.S. (1994) TranformGen: automating the maintenance of structured environments. *ACM Trans. on Programming Languages and Systems*, 16(3), 727–774
283. Garlan D., Perry D.E. (1995) Introduction to the special issue on software architecture. *IEEE Trans. Soft. Eng.*, 21(4), 269–274
284. Gary T., Sitaraman M. (eds) (2000) *Foundations of Component-Based Systems.* Cambridge University Press, New York
285. Gasfield D. (1997) *Algorithms on Strings, Trees, and Sequences: Computer Science and Computational Biology.* Cambridge Univ. Press, New York
286. Gasparski W.W. (2000) Aesthetic considerations in evaluating technical products: selected issues of design methodology. In: *Proc. of 15th Eur. Meeting on Cybern. and Syst. Res.,* 1, pp. 269–274

287. Gavish B. (1992) Topological design of telecommunication networks – the overall design problem. *EJOR*, 58, 149–172
288. Gavrilova T.A., Zudilova E.V. (1994) Conceptual design of interfaces for knowledge acquisition systems. *Eng. Cybernetics*, 2, 3–11, (in Russian)
289. Geoffrion A.M. (1987) An introduction to structured modeling. *Manag. Sci.*, 33(5), 547–588
290. Geoffrion A.M. (1992) The SML language for structured modeling. *Oper. Res.*, 40(1), 38–75
291. Gerchak Y., Henig M. (1986) An inventory model with component commonality. *Oper. Res. Lett.*, 5(3) 157–160
292. Gerchak Y., Magazine M.J., Gamble A.B. (1988) Component commonality with service level requirements. *Manag. Sci.*, 34(6) 753–760
293. Gero J.S. (ed) (1985) *Design Optimization.* Academic Press, New York
294. Gero J., Sudweeks F. (eds) (1996) *Advances in Formal Design Methods.* Kluwer Academic Publishers, Boston
295. Gero J., Sudweeks F. (eds) (1998) *Artificial Intelligence in Design'98.* Kluwer Academic Publishers, Dordrecht
296. Gershenson J.K., Prasad G.J., Allamneni S. (1999) Modular product design: a life-cycle view. *Trans. of the SDPS*, 3(4), 13–26
297. Gerstl P., Pribbenow S. (1996) A conceptual theory of part-whole relations and its applications. *Data and Knowledge Engineering*, 20(3), 305–322
298. Gertsbakh I. (1977) *Models of Preventive Maintenance.* North Holland, Amsterdam
299. Gertsbakh I. (2000) *Reliability Theory with Applications to Preventive Maintenance.* Springer, Berlin
300. Giachetti R.E. (1998) A decision support system for material and manufacturing process selection. *J. of Intell. Manufact.*, 9(3), 265-276
301. Giachetti R.E. (1999) A standard manufacturing information model to support design for manufacturing in virtual enterprises. *J. of Intell. Manufact.*, 10(1), 49–60
302. Gijselaers W., Tempelaar W.H., Keizer P.K., Blommaert J.M., Bernard E.M., Ksaper H. (eds) (1995) *Educational Innovations in Economics and Business Administration: The Case of Problem Solving.* Kluwer Academic Publishers, Dordrecht
303. Gil-Aluja J. (1997) *The Interactive Management of Human Resources in Uncertanty.* Kluwer Academic Publishers, Dordrecht
304. Girault C., Valk R. (2002) *Petri Nets in Systems Engineering.* Springer
305. Glotov V.A., Paveljev V.V. (1984) *Vector Stratification.* Nauka, Moscow (in Russian)
306. Glover F. (ed) (2003) *Handbook of Meta-Heuristics.* Kluwer Academic Publishers, Boston
307. Glover F., Klingman D., Phillips N., Ross, T. (1985) Integrating modeling, algorithm design and computational implementation to solve large scale nonlinear mixed integer programming problems. In: Monma C., (ed.), *Annals of Oper. Res.*, Vol. 5, pp. 395–411
308. Glover F., Laguna M. (1997) *Tabu Search.* Kluwer Academic Publishers, Boston
309. Godor I., Magyar G. (2005) Cost-optimal topology planning of hierarchical access networks. *Computers and Operations Res.* 32(1), 59–86
310. Goebel K. (2001) Architecture and design of a diagnostic information fusion system. *AI EDAM*, 15(4), 335–348

311. Goel P.S., Singh N. (1998) Creativity and innovation in durable product development. *Comp. & Ind. Eng.*, 35(1–2), 5–8
312. Goldberg D.E. (1989) *Genetic Algorithm in Search, Optimization and Machine Learning.* Addison-Wesley, Reading, MA
313. Golden B.L., Hevner A., Power D. (1986) Decision insight system for microcomputers: a critical evaluation. *Comp. & Oper. Res.*, 13(2–3), 287–300
314. Gomez F., Chandrasekaran B. (1981) Knowledge organization and distribution for medical diagnosis. *IEEE Trans. SMC*, 11(1) 34–42
315. Gonzalez T. (1985) Clustering to minimize the maximum intercluster distance. *Theoret. Comput. Sci.*, 38, 293–306
316. Gonzalez-Zugasti J.P., Otto K.N., Baker J.D. (2000) A method for architecting product platform. *Res. in Eng. Des.*, 12(2), 61–72
317. Gonzalez-Zugasti J.P., Otto K.N., Baker J.D. (2001) Assessing value in platform product family design. *Res. in Eng. Des.*, 13(1), 30–41
318. Gordon A.D. (1986) Consensus of supertrees: the synthesis of rooted trees containing overlapping sets of labeled leaves. *J. of Classification*, 3(2), 335–348
319. Gordon A.D. (1990) Constructing dissimilarity measures. *J. of Classification*, 7(2), 257–269
320. Gower J.C. (1985) Measures of similarity, dissimilarity, and distance. In: Kotz S., Johnson N.L. (eds), *Encyclopedia of Statistical Science*, vol. 5. J. Wiley & Sons, New York, pp. 397–405
321. Grady J.O. (1994) *System Integration.* CRC Press, Roca Raton, FL
322. Grant D., Steiblitz P.H., Walter W. (1999) On developing system architecture, systems engineering, and project management courses at RIT. In: *Proc. of Intl. Conf. on Syst. Eng. ICSE99*, Las Vegas, pp. SE109–113
323. Griese J., Kurpicz R. (1985) Investigating the buying process for the introduction of data processing in small and medium-sized firms. *Inform. & Manag.*, 8, 41–51
324. Griswold W.R. (1987) Theoretical analysis of the sensitivity of the solid phase antibody assay (ELISA). *Molecular Immunology*, 24, 1291–1294
325. Grosh D., Agarwal R. (1991) Model selection and sequencing in decision support systems. *OMEGA*, 2(2-3), 157–167
326. Grossmann I.E. (1990) Mixed-integer non-linear programming techniques for the synthesis of engineering systems. *Res. in Eng. Des.*, 1(2–3), 205–228
327. Grossmann I.E., Westerberg A.W. (2000) Research challenges in process systems engineering. *AIChE Journal*, 46, 1700–1703
328. Grover V., Malhotra M.K. (1997) Business process reengineering: a tutorial on the concept, evolution, method, technology and application. *J. of Oper. Manag.*, 15(3), 193–213
329. Gruber T. (1995) Toward principles or the design of ontologies used for knowledge sharing. *Int. J. of Human-Computer Studies*, 43(5–6), 907–928
330. Gudivada V.N., Raghavan V.V. (1995) Design and evaluation of algorithms for image retrieval by spatial similarity. *ACM Trans. Inf. Syst.*, 13(2), 115–144
331. Guenov M.D., Barker S.G. (2005) Application of axiomatic design and design structure matrix to the decomposition of engineering systems. *Systems Engineering*, 8(1), 29–40
332. Gupta A., Shah H.C. (1997) *Performance based strategy evaluation methodology for earthquake risk management.* Technical report 122, Stanford University, Stanford
333. Gupta A.P., Birmingham W.P., Siewiorek D.P. (1993) Automating the design of computer systems. *IEEE Trans. on Computer-Aided Design of Integrated Circuits and Systems,* 12(4), 473–487

334. Guzakov N.N., Matsnev D.N. (2005) Multicriteria comparison analysis of design decisions for problem *last mile* in access to service of common usage networks. In: *Int. Workshop on Distributed Computer and Communication Networks DCCN2005*, (Sofia, Bilgaria), Technosphera, Moscow, pp. 105–110 (in Russian)
335. Haas O.C.L. (1998) *Radiotherapy Treatment Planning: New System Approaches*. Springer, London
336. Hackbarth A., Grover V. (1999) The knowledge repository: organization memory information systems. *Inform. Syst. Manag.*, 16(3) 21–30
337. Haimes Y.Y. (ed) (1977) *Hierarchical Analysis of Water Resources Systems. Modeling and Optimization of Large Scale Systems*. McGraw Hill, New York
338. Haimes Y.Y. (1981) Hierarchical holographic modeling. *IEEE Trans. SMC*, 11(9), 606–617
339. Haimes Y.Y. (ed) (1982) *Large Scale Systems*. North Holland, Amsterdam
340. Haimes Y.Y. (1982) Modeling of large scale systems in a hierarchical-multiobjective framework. In: Haimes, Y.Y. (ed), *Large Scale Systems*. North Holland, Amsterdam
341. Haimes Y.Y., Tarvainen K., Shima T., Thadathil, J. (1990) *Hierarchical Multiobjective Analysis of Large-Scale Systems*. HPC, New York
342. Hajela P., Lin C.Y. (1992) Genetic search strategy in multicriterion optimal design. *Structural Optimization*, 4, 99–107
343. Hales C. (1985) Designer as Chameleon. *Design Studies*, 6(2), 111–114
344. Hall A.D., III (1989) *Metasystems Methodology. A New Synthesis and Unification*. Pergamon, Oxford
345. Hall P.A.V. (1973) Equivalence between AND/OR graphs and context-free grammars. *Comm. of the ACM*, 16(7), 444–445
346. Halpern J.Y., Moses Y. (1990) Knowledge and common knowledge in a distributed environment. *J. of the ACM*, 38(3), 549–587
347. Hamacher H.W., Kuefer K.-H. (2002) Inverse radiation therapy planning - a multiple objective optimization approach. *Discr. Appl. Math.*, 118(1–2), 145–161
348. Hamlin G.J., Sanderson A.C. (1998) *Modular Approach to Reconfigurable Parallel Robotics*. Kluwer Academic Publishers, Boston
349. Hammer M., Champy J. (1993) *Reengineering the Corporation: A Manifesto for Business Revolution*. Harper Business, Boston
350. Hanne T. (2000) *Intelligent Strategies for Meta Multiple Criteria Decision Making*. Kluwer Academic Publishers, Boston
351. Hannenhalli S., Pevzner P. (1995) *Transforming men into mice*, Technical report CSE-95-012, Dept. of Comp. Sci. and Eng., Pennsylvania State University
352. Hansen C.T., Riitahuhta A. (2001) Issues on the development and application of computer tools to support product structuring and configuring. *Int. J. of Technology Management*, 21(3–4), 240–256
353. Harary F. (1995). *Graph Theory*. Addison Wesley, Reading, MA
354. Harary F., Norman R.Z., Carthwright D. (1965) *Structural Models: An Introduction to the Theory of Directed Graphs*. J. Wiley & Sons, New York
355. Harary F., Batell M.F. (1981) What is a system? *Social Networks*, 3(1), 29–40
356. Harel D. (1980) And/Or programs: a new approach to structured programming. *ACM Trans on Programming Languages and Systems*, 2(1), 1–17
357. Harel D., Lachover H., Naamad A., Pnueli A., Politi M., Sherman R., Shtull-Trauring A., Trakhtenbrot (1990) STATEMATE: a working environment for the development of complex reactive systems. *IEEE Trans. on SE*, 16(4), 403–414

358. Harel D., Naamad A. (1996) The STATEMATE semantics of statecharts. *ACM Trans. of Software Engineering and Methodology*, 5(4), 293–333
359. Harhalakis G., Lin C.P., Nagi R., Proth J.M. (1992) Hierarchical decision making in computer integrated manufacturing systems. In: *Proc. of the Third Intl. Conf. on CIM*. IEEE CS Press, pp. 15–24
360. Hart A. (1992) *Knowledge Acquisition for Expert Systems*, 2nd ed. Kogan Page Publishers, London
361. Hartigan J.A. (1975) *Clustering Algorithms*. J. Wiley & Sons, New York
362. Hartman D.E., Larson D. (2000) Design4Practice. In: *The 28th Israel Conf. on Mechanical Engineering*, Ben-Gurion University, Beer Sheva, pp. 419–423
363. Hatamura Y. (1999) *The Practice of Machine Design*. Clarendon Press, Oxford
364. Hatcher M (2001) Tutorial on technology transfer and survey design and data collection for measuring Internet and Intranet existence, usage, and impact (Survey-2000) in acute care hospitals in the United States. *J. of Medical Syst.*, 25(1), 27–45
365. Hatcher M. (2001) Tutorial on technology transfer and survey design and data collection for measuring Internet and Intranet existence, usage, and impact (Survey-2000) in acute care hospitals in the United States. *J. of Medical Syst.*, 25(5), 333–344
366. Hatley D.J. Hruschka P., Pirbhai I.A. (2000) *Process for System Architecture and Requirements Engineering*. Dorset House, New York
367. Hayes-Roth F., Waterman D.A., Lenat D. (eds) (1983) *Building Expert Systems*, Addison-Wesley, MA
368. Hazelrigg G.A. (1996) *Systems Engineering: An Approach to Information Based Design*. Prentice Hall, NJ
369. Hedberg S. (1993) New knowledge tools. *Bite*, 7, 104-111
370. Heineman G.T., Council W.T. (eds) (2001) *Component Based Software Engineering*. Addison-Wesley, Reading, MA
371. Henderson R.M., Clark K.B. (1990) Architectural innovation: the reconfiguration of existing product technologies and failure of established firms. *Administrative Science Quarterly*, 35, 27–38
372. Henderson P.H.J., Vriens D.J. (1999) Knowledge-based systems and knowledge management: friends or foes? *Inform. & Manag.* 35(2), 113–125
373. Hernandez G., Allen J.K., Mistree F. (2003) Platform design for customizable products as a problem of access in a geometric space. *Eng. Optimization*, 35(3), 229–254
374. Herrera-Viedma E., Herrera F., Chiclana F. (2002) A consensus model for multiperson decision making with different preference structures. *IEEE Trans. SMC, Part A*, 32(3), 394–402
375. Hessami A.G. (1999) Risk management: a systems paradigm. *Syst. Eng.*, 2(3), 156–167
376. Hien W.N., Poh L.K., Feriadi H. (2000) The use of performance-based simulation tools for building design and evaluation – a Singapore perspective. *Building and Environment*, 35(8), 709–736
377. Himmelblau D.M. (ed) (1973) *Decomposition of Large-Scale Problems*. North-Holland, New York
378. Hofer A.P., Halman J.I.M. (2005) The potential of layout platforms for modular complex products and systems. *J. of Engineering Design*, 16(2), 237–255
379. Holland J.H. (1975) *Adaptation in Natural and Artificial Systems*, University of Michigan Press, Ann Arbor, MI
380. Holmquist T.K.P., Person M.L. (2003) Analysis and improvement of product modularization methods: their ability to deal with complex products. *Systems Engineering*, 6(3), 195–209

381. Holsapple C.W., Joshi K.D. (2002) A collaborative approach to ontology design. *Comm. of the ACM*, 45(2), 42–47
382. Hon T., Chon S.K., Bong T.Y. (2000) Building simulation: an overview of developments and information sources. *Building and Environment*, 35(4), 347–361
383. Horaud R., Skordas T. (1989) Stereo correspondence through feature grouping and maximal cliques. *IEEE Trans. PAMI*, 11(11), 1168–1180
384. Horowitz R., Maimon O. (2000) Computer aided conceptual design based on and/or trees. In: *2000 Int. CIPR Design Seminar*, Haifa, Israel, pp. 453–456
385. Howard R.A. (1988) Decision analysis: practice and promise. *Manag. Science*, 34(6), 679–695
386. Hu Y.X., Liu S.C., Dong W. (1996) *Earthquake Engineering.* Chapman and Hall, London
387. Huang C.C., Kusiak A. (1998) Modularity in design of products and systems. *Trans. SMC, Part A*, 28(1), 66–77
388. Huang G., Jiao R., Tseng M. (eds) (2004) Special issue on platform product development and customization. *AI EDAM*, 18(1)
389. Hubka V., Eder W.E. (1988) *Theory of Technical Systems.* Springer, Berlin
390. Humphreys P. (1986) Intelligence in decision support. In: *New Directions in Research on Decision Making.* Elsevier, Amsterdam, pp. 333–361
391. Hutchings J.F. (1996) *Builder's Guide to Modular Construction.* McGraw-Hill, New York
392. Huttenlocher D.P., Klanderman G.A., Rucklidge W.J. (1993) Comparing images using the Hausdorff distance. *IEEE Trans. PAMI*, 15(9), 850–863
393. Isaksson O., Keski-Seppala S., Eppinger S.D. (2000). Evaluation of design process alternatives using signal flow graphs. *J. of Eng. Des.*, 11(3), 211–224
394. Ishida K., Ohta T. (2001) On a mathematical comparison between hierarchy and networks with classification of coordination structures. *Computational & Mathematical Organization Theory*, 7(4), 311–330
395. Ishino Y., Jin Y. (2001) Acquiring engineering knowledge from design processes. *AI EDAM,* 16(2), 73–91
396. Ivari J., Maansaari J. (1998) The usage of system development methods: are we stuck to old practice? *Inform. & Soft. Techn.*, 40(9), 501–510
397. Ivins J.R. (1997) Interdisciplinary project work: practice makes perfect? *IEEE Trans. on Education*, 40(3), 179–183
398. Jackson M.C. (2000) Critical system thinking and pratice. *Eur. J. of Operational Research*, 128(2) 233–244
399. Jain A.K., Dubes R.C. (1988) *Algorithms for Clustering.* Prentice-Hall, Englewood Cliffs, NJ
400. Jain A.K., Murty M.N., Flynn P.J. (1999) Data clustering: a review. *ACM Computing Surveys*, 31(3), 264–323
401. Janson M.A., Subramanian A. (1996) Packaged software: selection and implementation policies. *INFOR*, 34(2), 133–154
402. Jell T. (1998) *Component-Based Software Engineering.* Cambridge University Press, New York
403. Jiang X., Munger A., Bunke H. (2001) On median graphs: properties, algorithms, and applications, *IEEE Trans. PAMI*, 23(10), 1144–1151
404. Jiao J., Tseng M.M. (2000) Understanding product family for mass customization by developing commonality indices. *J. of Eng. Des.*, 11(3), 225–243
405. Johannesson H., Claesson A. (2005) Systematic product platform design: a combined function-means and parametric modeling approach. *J. of Engineering Design*, 16(1), 25–43

406. Johnson S.C. (1967) Hierarchical clustering schemes. *Psychometrika*, 2, 241–254
407. Jolion J.-M. (2001) Feature similarity. In: Lev M.S. (ed), *Visual Information Retrieval.* London, Springer, pp. 121–143
408. Jones C.V. (1996) *Visualization and Optimization.* Kluwer Academic Publishers, Boston
409. Jones J.C. (1992) *Design Methods.* 2nd ed. J. Wiley & Sons, New York
410. Jones R.W., Lowe A., Harrison M.J. (2002) A framework for intelligent medical diagnosis using the theory of evidence. *Knowledge-Based Syst.*, 15(1–2) 77–84
411. Jonsson A. (2000) Tools and methods for environments: assessment of building products – methodological analysis of six selected approaches. *Building and Environment*, 35(13), 223-228
412. Jordan P.W., Keller K.S., Tucker R.W., Vogel D. (1989) Software storming. Combining rapid prototyping and knowledge engineering. *Computer*, 22(5), 39–48
413. Jorgensen P.C. (2002) *Software Testing. A Craftman's Approach.* 2nd. ed. CRC Press, Boca Raton, FL
414. Josephson J.R., Chandrasekaran B., Carrol M., Iyer N., Wasacz B., Rizzoni G., Li Q., Erb D.A. (1998) An architecture for exploring large design spaces. In: *Proc. of the National Conf. on AI AAAI-98.* AAAI Press/MIT Press, pp. 143–150
415. Joshi A., Mishra N., Batta R., Nagi R. (2004) *Ad hoc* sensor network topology design for distributed fusion: a mathematical programming approach. In: *Proc. of the Seventh Int. Conf. Information Fusion*, Stockholm, pp. 836–841
416. Juengst W.E., Heinrich M. (1998) Using resource balancing to configure modular systems. *IEEE Expert*, 13(4), 50–58
417. Juttner A., Orban A., Fiala Z. (2005) Two new algorithms for UMTS access network topology design. *EJOR*, 164(2), 456–474
418. Kacprzyk J., Nurmi H., Fedrizzi M. (eds) (1997) *Consensus Under Fuzziness*, Kluwer Academic Publishers, Boston
419. Kamrani A.K., Salhieh S.M. (2000) *Product Design for Modularity.* Kluwer Academic Publishers, Boston
420. Kan S.H., Parrish J., Manlove D. (2001) In-process metrics for software testing. *IBM Syst. J.*, 40(1), 220–241
421. Kanda J., Shah H. (1997) Engineering role in failure cost evaluation for buildings. *Structural Safety,* 19(1), 79–90
422. Kaner C., Falk J., Nguyen H.Q. (1999) *Testing Computer Software*, 2nd ed. J. Wiley & Sons, New York
423. Karne R.K., Baras J.S., Ball M.O., Bashyam S., Kebede A., Williams J., Trichur V.S., Karir M., Lai H.-T., Dandekar S. (1998) Integrated product and process design environment tool for manufacturing T/R modules. *J. of Intell. Manufact.,* 9(1), 9–15
424. Karp R. (1997) Probabilistic analysis of partitioning algorithm for the traveling-salesman problem. *Math. of Oper. Res.*, 2(3), 209–224
425. Katz R.H. (1990) Toward a unified framework for version modeling in engineering databases. *ACM Comput. Surv.*, 22(4), 375–408
426. Kaula R. (1994) Integrating decision support systems in organizations: a three-level framework. *Industrial Manag. & Data Syst.*, 94(4), 6–14
427. Keeney R.L., Raiffa H. (1976) *Decisions with Multiple Objectives: Preferences and Value Tradeoffs.* J. Wiley & Sons, New York
428. Kellerer H., Pferschy U., Pisinger D. (2004) *Knapsack Problems.* Springer, Berlin

429. Kemeny J.G., Snell J.L. (1972) *Mathematical Models in the Social Sciences.* MIT Press, Cambridge, MA
430. Kendall G., Burke E.K. (eds) (2005) *Search Methodology: Introductory Tutorials in Optimization and Decision Techniques.* Springer, London
431. Keravnou E., Lavra M. (2001) AIM portraits: tracing the evolution of artificial intelligence in medicine and predicting its future in the new millenium. *Artif. Intell. in Medicine*, 23(1), 1–4
432. Key D. (1988) *Earthquake Design Practice for Buildings.* Thomas Telford, London
433. Kim D.-J., Kogut B. (1996) Technological platforms and diversification. *Organization Science*, 7(3) 283–301
434. Kim J., Courtney J. (1988) A survey of knowledge acquisition techniques and their relevance to managerial problem solving. *Decision Support Systems*, 4, 269–284
435. Kimbrough S.O., Pritchett C., Bieber M., Bhargava H. (1990) The Coast Guard's KSS Project. *Interfaces*, 20(6), 5–16
436. King W.R., Marks P.V. Jr., McCoy S. (2002) The most important issues in knowledge management. *Comm. of the ACM*, 45(9) 93-97
437. Kitamura Y., Sano T., Namba K., Mizoguchi R. (2002) A functional concept ontology and its application to automatic identification of functional structures. *Advanced Engineering Informatics*, 16, 145–163
438. Kitts B., Edvinsson L., Beding T. (2001) Intellectual capital: from intangible assets to fitness landscapes. *Expert Syst. with Appl.*, 20(1), 35–50
439. Klein J.H. (1994) Cognitive processes and operations research: a human information processing perspective. *J. of Oper. Res. Soc.*, 45(8), 855–866
440. Knjazew D. (2002) *OmeGa: A Competent Genetic Algorithm for Solving Permutation and Scheduling Problems.* Kluwer Academic Publishers, Boston
441. Knosala R., Pedrycz W. (1992) Evaluation of design alternatives in mechanical engineering. *Fuzzy Sets and Syst.*, 47, 269–280
442. Knuth D.E., Raghunathan A. (1992) The problem of compatible representatives. *SIAM J. on Disc. Math.*, 5(3), 422–427
443. Kobbacy K.A.H. (2004) On the evolution of an intelligent maintenance optimization system. *J. of the ORS*, 55(2), 139–146
444. Kobsa A., Wahlster W. (eds) (1989) *User Models in Dialog Systems*, Springer, Berlin
445. Kokkolaras M., Fellini R., Kim H.M., Michelena N., Papalambros P. (2002) Extension of the target cascading formulation to the design of product families. *Structural and Multidisciplinary Optimization*, 24(4), 293–301
446. Koksalan M.M., Karwan M.H., Zionts S. (1984) An improved method for solving multiple criteria problems involving discrete alternatives. *IEEE Trans. SMC*, 14, 24–34
447. Kolodner J.L., Riesbeck C.K. (1986) *Experience, Memory, and Reasoning.* Lawrance Erlbaum Associates, Hillsdale, NJ
448. Kononenko I. (2001) Machine learning for medical diagnosis: history, state of the art and perspective. *Artif. Intell. in Medicine*, 23(1), 89–109
449. Korhonen P., Wallenius J., Zionts S. (1984) Solving the discrete multiple criteria problem using convex cones. *Manag. Science*, 30(11), 1336-1345
450. Korte B., Vygen J. (2002) *Combinatorial Optimization: Theory and Algorithms.* Springer, Berlin
451. Kozin F., Zhou H.K. (1988) *Systems study of urban response and reconstruction due to catastrophic earthquake.* Technical report NCEER-88-0027, National Center for Earthquake Engineering Research, Buffalo, NY

452. Kramer S.L. (1995) *Geotechnical Earthquake Engineering.* Prentice-Hall, NJ
453. Krasnoshekov P.S., Morozov V.V., Fedorov, V.V. (1979) Decomposition in design problems. *Eng. Cybernetics*, 2, 7–17 (in Russian)
454. Kreinovich V., Nguyen H.T., Prasad N.S., Santiprabhob P. (2004) Intelligent technologies: an introduction. *Int. J. of Intelligent Systems*, 19(1–2), 1–8
455. Krishnan V., Ulrich K. (2001) Product development decisions: a review of the literature. *Manag. Sci.*, 47(1), 1–21
456. Kricka L.J. (1993) Trends in immunoassay technologies. *J. of Clinical Immunoassay*, 16, 267–271
457. Kron G. (1963). *Diakoptics.* MacDonald, London
458. Kudinov O.P., Levin M.Sh. (2005) Towards structural approach to modeling of political administration. Unpublished manuscript (in Russian)
459. Kupeev K.Y., Wolfson H.J. (1996) A new method of estimating shape similarity. *Pattern Recogn. Lett.*, 17, 873–887
460. Kuppuraju N., Ittimakin P., Mistree F. (1985) Design through selection: a method that works. *Design Studies,* 6(2), 91–106
461. Kuppuraju N., Ganesan S., Mistree F., Sobieski J.S. (1985) Hierarchical decision making in system design. *Eng. Opt.*, 8(3), 223–252
462. Kurtz D.A., Skerritt J.H., Stanker L. (eds) (1995) *New Frontiers in Agrochemical Immunoassay.* Aoac International
463. Kusiak A. (1992) *Concurrent Engineering: Automation, Tools, and Techniques.* J. Wiley & Sons, New York
464. Kusiak A. (1999) *Engineering Design: Products, Processes, and Systems.* Academic Press, New York
465. Kusiak A. (2002) Integrated product and process design: a modularity perspective. *J. of Eng. Des.*, 13(3), 223–231
466. Kvasnicka V., Pospichal J. (1990) Maximal common subgraphs of molecular graphs. *Reports Molecular Theory*, 1, 99–106
467. Kyng M. (1991) Designing for cooperation: cooperating in design. *Comm. of the ACM*, 34(12), 65–75
468. La Fleur R.S. (1991) Evolutionary design theory using dynamic variation and thermodynamic selection. *Res. in Eng. Des.*, 3(1), 39–55
469. Lagorio H.J. (1990) *Earthquakes: An Architect's Guide to Nonstructural Seismic Hazards.* J. Wiley & Sons, New York
470. Laird J.E., Newell A., Rosenbloom P.S. (1987) SOAR: an architecture for general intelligence. *Artif. Intell.*, 33, 1–64
471. Lammari N., Metais E. (2004) Building and maintaining ontologies: a set of algorithms. *Data and Knowledge Engineering*, 48(2), 155–176
472. Lang G.T., Levin M.Sh. (1999) Multilevel approach to systems engineering education. In: *13th Intl. Conf. on Systems Engineering ICSE99*, Las Vegas, USA, pp. CE181–185
473. Laporte G., Osman I. (eds) (1995) *Annals of Oper. Res., Metaheuristics in Combinatorial Optimization*, Vol. 69
474. Larichev O.I., Moshkovich E.M., Furems E.M., Mechitov A.I., Morgoev V.K. (1991) *Construction of Full and Contradiction-Free Knowledge Bases.* Iec ProGAMMA, The Netherlands
475. Le Blanc A., Jellassi M.T. (1989) DSS software selection: a multiple criteria decision methodology. *Inform. & Manag.*, 17(2), 49–66
476. Lee H. (1993) A structured methodology for software development effort prediction using the analytic hierarchy process. *J. Syst. Soft.*, 21(2), 179–186
477. Lee J. (2004) *A First Course in Combinatorial Optimization.* Cambridge University Press, New York

478. Lee J.H., Kim Y.-G. (2001) A stage model of organizational knowledge management: A latent content analysis. *Expert Syst. with Appl.*, 20(4), 299–311
479. Lee Y.H., Shin K.G. (1987) Optimal reconfiguration strategy for a degradable multimodule computing system. *J. of the ACM*, 34(2), 326–348
480. Lehman M.M., Ramil J.F. (2001) Rules and tools for software evolution planning and management. *Annals of Soft. Eng.*, 11, 15–44
481. Lehner P.S., Barth S.W. (1985) Expert systems on microcomputers, *Expert Syst.*, 2(4), 198–208
482. Leibovitch E., Yankelevsky D., Segal D. (1997) *Evaluation of Earthquake Damage for Typical Structures.* National Building Research Institute, Technion, Haifa (in Hebrew)
483. Lemieux M., Bordage G. (1992) Professional versus structural semantic analysis of medical diagnostic thinking. *Cognitive Sci.* 16, 198–204
484. Lenat D.B., Guha R.V. (1990) *Building Large Knowledge-Based Systems.* Addison-Wesley, Reading, MA
485. Lendaris G.G. (1980) Structural modeling – a tutorial guide. *IEEE Trans. SMC*, 10(12), 807–840
486. Lethbridge T.C. (2000) Priorities for the education and training of software engineers. *J. of Syst. and Soft.*, 53(1), 53–71
487. Levary R.R. (1988) Introduction to engineering design using operations research methods. In: Levary R.R. (ed), *Engineering Design. Better Results Through Operations Research Methods.* North Holland, New York, pp. 1–16
488. Levin M.Sh. (1982) Deterministic planning problems for identical processors and simultaneous arrival of tasks. *Eng. Cybern.*, 20(4), 49–55
489. Levin M.Sh. (1986) *Application of Optimization Combinatorial Models in Computer-Aided Systems.* VNIITEMR, Moscow (in Russian)
490. Levin M.Sh. (1989) Hierarchical hypertext system, *Aut. Doc. & Math. Ling.*, 23(3), 52–59
491. Levin M.Sh. (1992) Some complicated discrete multi-criteria decision making problems. In: *Proc. of Tenth Intl. Conf. on Multiple Criteria Decision Making*, 3, Taiwan, pp. 449–458
492. Levin M.Sh. (1993) Hierarchical components of human-computer systems. In: *Human–Computer Interactions,* LNCS 753. Springer, Berlin, pp. 37–52
493. Levin M.Sh. (1995) The third literacy. *Aut. Doc. & Math. Ling.*, 29(3), 66–81
494. Levin M.Sh. (1996) Hierarchical morphological multicriteria design of decomposable systems. *Concurrent Engin.: Res. and Appl.*, 4(2), 111–117
495. Levin M.Sh. (1996) Improvement of decomposable systems. In: *Advances in Concurrent Engineering.* Technomic Publishing Co., Toronto & Pennsylvania, pp. 319–325
496. Levin, M.Sh. (1996) Hierarchical combinatorial approach to career planning, *Nauchno-Tekhnicheskaya Informatsiya, Ser. 2*, 12, 22–27 (in Russian)
497. Levin M.Sh. (1998) *Combinatorial Engineering of Decomposable Systems.* Kluwer Academic Publishers, Dordrecht
498. Levin M.Sh. (1999) Algorithm systems for combinatorial optimization: hierarchical multistage framework. In: *13th Intl. Conf. on Systems Engineering ICSE99*, Las Vegas, USA, pp. CS109–114
499. Levin M.Sh. (2000) Towards systems engineering education. In: *Proc. of 15th Eur. Meeting on Cybernetics and Systems Research.* Vol. 1, Vienna, Austria, pp. 257–262
500. Levin M.Sh. (2000) Allocation on binary relation: combinatorial models. In: *14th Intl. Conf. on Systems Engineering ICSE2000*, Coventry University, UK, pp. 372–376

501. Levin M.Sh. (2001) Hierarchical approach for engineering skills acquisition. In: Monostori L., Vancza J., Ali M. (eds), *Engineering of Intelligent Systems*, LNCS 2070, Springer, Berlin, pp. 92–100
502. Levin M.Sh. (2001) Digraph description of $K$-exchange technique for optimization over permutations and adaptive algorithm system. *Foundations of Comput. and Decision Sci.*, 26(3), 225–235
503. Levin M.Sh. (2001) System synthesis with morphological clique problem: fusion of subsystem evaluation decisions. *Information Fusion*, 3(4), 225–237
504. Levin M.Sh. (2002) Towards combinatorial analysis, adaptation and planning of human–computer systems. *Appl. Intell.*, 16(3), 235–247
505. Levin, M.Sh (2002) Combinatorial evolution of composite systems. In: *Proc. of the 16th Eur. Meeting on Cybernetics and System Research EMCSR2002*, Vol. 1, Vienna, Austria, 275–280
506. Levin M.Sh. (2003) Common part of preference relations. *Foundations of Comput. and Decision Sci.*, 28(4), 223–246
507. Levin M.Sh, Home page http: //www.iitp.ru/mslevin/
508. Levin M.Sh. (2005) Modular system synthesis: example for composite packaged software. *IEEE Trans. on SMC, Part C*, 35(4), 544–553
509. Levin M.Sh. (2005) Hierarchical morphological design approach: some new applications in communication networks. Presentation at *Int. Workshop on Distributed Computer and Communication Networks DCCN 2005*, Sofia, Bulgaria
510. Levin M.Sh., Mihailov A.A. (1988) *Technology's Fragments of Object Set's Stratification.* Preprint, Institute for System Analysis, Moscow (in Russian)
511. Levin M.Sh., Rival I. (1999) A procedure: common part of two digraphs. In: *Proc. Int. Conf. on Control Problems*, 2, Moscow, pp. 53–57
512. Levin M.Sh., Shraga R., Zamir H., Shiff A., Inon S. (2000) Multicriteria design of product trajectory: example. Presentation at *ORSIS 2000*, Eilat, Israel.
513. Levin M.Sh., Feldman B.J. (2000) System evolution: example for signal processing. In: *14th Intl. Conf. on Systems Engineering ICSE2000*, Coventry University, UK, pp. 377–380
514. Levin M.Sh., Nisnevich M.L. (2001) Combinatorial scheme for management of life cycle: example for concrete macrotechnology. *J. of Intell. Manufact.*, 16(4), 393–401
515. Levin M.Sh., Sokolova L.V. (2004) Hierarchical combinatorial planning of medical treatment. *Computer Methods and Programs in Biomedicine*, 73(1), 3–11
516. Levin M.Sh., Danieli M.A. (2005) Hierarchical decision making framework for evaluation and improvement of composite systems (example for building). *INFORMATICA*, 16(2), 213–240
517. Levin M.Sh., Firer M.A. (2005) Hierarchical morphological design of immunoassay technology. *Computers in Biology and Medicine*, 35(3), 229–245
518. Levinson R. (1992) Pattern associativity and the retrieval of semantic networks. *Comput. Math. Appl.*, 23, 573–600
519. Levitt J. (2002) *Complete Guide to Preventive and Predictive Maintenance.* Industrial Press, New York
520. Levy R., Rutenberg A., Segal F., Marianchik E. (1996) Analytical evaluation of elevators safety code seismic provisions. *Elevator World,* pp. 110–115
521. Li H.L. (1987) Solving discrete multicriteria decision problems based on logic-based decision support systems. *Decision Support Syst.*, 3, 101–118
522. Li S.-H., Danzig P. (1997) Boolean similarity measures for resource discovery. *IEEE Trans. Knowl. Data Eng.*, 9(6), 863–876

523. Li S., Ying M. (2003) *Generalized Region-Connection Calculus.* Elsevier server of preprints in CS: http: //www.compscipreprints.com
524. Li W.D., Ong S.K., Fuh J.Y.H., Wong Y.S., Lu Y.Q., Nee A.Y.C. (2004) Feature-based design in a distributed and collaborative environment. *Computer-Aided Design* 36(9), 775–797
525. Liang T.-P. (1988) Development of a knowledge-based model management system. *Oper. Res.*, 36(6), 849–863
526. Liang W.-Y., O'Grady P. (2000) A constrained evolutionary search formalism for remote design with modules. *Intl. J. of Computer-Integrated Manufact.,* 13(2), 65–74
527. Liebman J.S. (1986) Implementation issues for operations research software, *Comp. & Oper. Res.*, 13(2&3), 347–358
528. Liebisch D.C., Jain A. (1992) JESSI COMMON FRAMEWORK design nanagement – the means to configuration and execution of the design process. In: *Proc. of European Design Automation Conference EURO-DAC'92*, CS Press, Los Alamitos, pp. 552–557
529. Liebowitz J. (1993) Roll your own hybrids. *Bite*, 7, 113–115
530. Lindeburg M.R. (1996) *Seismic Design of Building Structures: A Professional's Introduction to Earthquake Forces and Design Details.* Professional Publicationns, New York
531. Lindell M.K., Perry R.W. (1997) Hazardous materials releases in the Northridge earthquake: implications for seismic risk assessment. *Risk Analysis*, 17(2), 147–156
532. Linstone H.A., Turoff M. (eds) (1975) *The Delphy Method: Techniques and Applications.* Addison-Wesley, Readings, MA
533. Lipson H., Pollack J.B., Suh N.P. (2002) On the origin of modular evolution. *Evolution*, 56(8), 1549–1556
534. Llinas J., Waltz E.L., White F.E. Jr. (1990) *Multisensor Data Fusion*, Artech House, Boston
535. Lomnitz C., Rosenblueth E. (eds) (1976) *Seismic Risk and Engineering Decisions.* Elsevier, New York
536. MacDonald A.S. (2001) Aesthetic intelligence: optimizing user-centered design. *J. of Eng. Des.*, 12(1), 59–74
537. Mackworth A.K. (1987) Constraint satisfaction. In: Shapiro S.C. (ed) *Encyclopedia on Artificial Intelligence*, J. Wiley & Sons, New York, pp. 205–211
538. Madanshetty S.I. (1995) Cognitive basis for conceptual design. *Res. in Eng. Des.,* 7(4), 234–240
539. Maher M.L., Tang H.-H. (2003) Co-evolution as a computational and cognitive model of design. *Res. in Eng. Des.* 14(1), 47–64
540. Maher M.L., de Silva Garza A.G. (1997) Case-based reasoning in design. *IEEE Expert*, 12(2), 34–39
541. Mailharro D. (1998) A classification and constraint-based framework for configuration. *AI EDAM*, 12(4), 383–397
542. Makinen E. (1988) On the rotation distance of binary trees. *Inform. Process. Lett.*, 26(5), 271–272
543. Malhorta Y. (2000) knowledge assets in the global economy: assessment of national intellectual capital. *J. of Global Information Management*, 8(3), 5–15
544. Manheim J.B., Rich R.C., Willnat L. (2001) *Empirical Political Analysis: Research Methods in Political Science.* Longman, New York
545. Mareschal B., Brans, J.-P. (1988) Geometrical representation for MCDA. *Eur. J. of Oper. Res.*, 34, 69–77
546. Margush T. (1982) Distance between trees. *Discr. Appl. Math.*, 4, 281–290

547. Marino G.G. (1997) *Earthquake Damage: Inspection, Evaluation, and Repair.* Lawyers & Judges Publishing Co., New York
548. Marosi A., Stiesmeyer J. (2001) Improving pediatric asthma patient outcomes by incorporation of effective interventions. *J. of Asthma*, 38(8), 681–690
549. Marquardt W., von Wedel L., Bayer B. (2000) Perspective on lifecycle process modeling. In: Malone M.F., Trainham J.A., Carnhan B. (eds), *Foundations of Computer-Aided Process Design,* AIChE Symposium Series, No. 323, 96, pp. 192–214
550. Marshall R., Leaney P.G. (2002) Holonic product design: a process for modular product realization. *J. of Eng. Des.*, 13(4), 293–303
551. Martello S., Toth P. (1990) *Knapsack Problem: Algorithms and Computer Implementation.* J. Wiley & Sons, New York
552. Martin J.M., Bahill A.T. (1996) *Systems Engineering Guidebook: A Process for Developing Systems and Products.* CRC Press, Boca Raton, FL
553. Martin M.V., Ishii K. (2002) Design for variety: developing standardized and modular product platform architecture. *Res. in Eng. Des.*, 13(4), 213–235
554. Mateus G.R., Cruz F.R.B., Luna H.P.L. (1987) An algorithm for hierarchical network design. *Location Science*, 21, 123–125
555. Matthews P.C., Blessing L.T.M., Wallace K.M. (2002) The introduction of a design heuristics extraction methods. *Advanced Eng. Informatics*, 16(1), 3–19
556. McDermott J. (1982) R1: a rule-based configurer of computer systems, *Artificial Intelligence,* 19(2), 39–88
557. McDermott J. (1988) A taxonomy of problem-solving methods. In: Marcus S. (ed), *Automating Knowledge Acquisition for Expert Systems.* Kluwer Academic Publishers, Boston, pp. 225–256
558. McDermott J. (1999) Why information technology inspired but cannot deliver knowledge management. *Calif. Manag. Review*, 41(4) 103–117
559. McGregor J.J. (1982) Backtracking search algorithms and the maximum common subgraph problem, *Software – Practice and Experience*, 12, 23-34
560. McKinley P.K., Sadjadi S.M., Kasten E.P., Cheng B.H.C. (2004) Composing adaptive software. *IEEE Computer*, 6, 56–64
561. McKinley P.K., Sadjadi S.M., Kasten E.P., Cheng B.H.C. (2004) *A taxonomy of compositional adaptation.* Tech. report MSU-CSE-04-17, Dept. Computer Science and Engineering, Michigan State University, Michigan
562. Mechitov A.I., Moshkovich H.M., Olson D.L., Killingsworth B. (1995) Knowledge acquisition tool for case-based reasoning systems. *Expert Systems with Applications*, 9(2), 201–212
563. Meesad P., Yen G.G. (2003) Combined numerical and linguistic knowledge representation and its application to medical diagnosis. *IEEE Trans. SMC, Part A* 33(2), 206–222
564. Mehrabi M.G., Ulsoy A.G., Koren, Y. (2000) Reconfigurable machining systems: key to future manufacturing. *J. of Intell. Manufact.*, 11, 403–419
565. Mesarovic M.D., Macko D., Takahara Y. (1970) *Theory of Hierarchical, Multilevel Systems.* Academic Press, New York
566. Messac A., Chen X. (2000) Visualizing the optimization process in real-time using physical programming. *Eng. Opt.*, 32(6), 721–747
567. Messac A., Martinez M.P., Simpson T.W. (2002) Effective product family design using physical programming. *Eng. Opt.*, 34(3), 245–261
568. Meyer M.H., Lehnerd A.P. (1997) *The Power of Product Platforms.* The Free Press, New York
569. Michalewicz M.D. (1996) *Genetic Algorithms + Data Structure = Evolutionary Programs.* 3rd ed. Springer, Berlin

570. Michel C. (2000) Ordered similarity measures taking into account the rank of documents. *Inform. Proc. & Manag.*, 37(4), 603–622
571. Michelena N., Papalambros P. (1997) A hypergraph framework for optimal model-based decomposition of design problems. *Computational Optim. and Appl.*, 8(3), 173–196
572. Miettinen K. (1999) *Nonlinear Multiobjective Optimization.* Kluwer Academic Publishers, Boston
573. Mikkola J.H., Gassmann O. (2003) Managing modularity of product architectures: Toward an integrated theory. *IEEE Trans. on Eng. Manag.*, 50(2), 204–218
574. Miles J.C., Gray W.A., Carnduff T.W., Santoyridis I., Faulconbridge A. (2000) Versioning and configuration management in design using CAD and complex wrapped objects. *Adv. Eng. Informatics*, 14(3), 249–260
575. Miller R.A. (1994) Medical diagnosis decision support systems – past, present, and future: a threaded bibliography and brief commentary. *J. Amer. Med. Inform. Assoc. JAMIA* 1(1) 8–27
576. Miller T. (2001) *Modular engineering: an approach to structuring business with coherent modular architectures of activities, artifacts and knowledge.* Ph.D. Thesis, Technical University of Denmark.
577. Mili F., Shen W., Martinez I., Noel Ph., Ram M., Zouras E., (2001) Knowledge modeling for design decisions. *Artif. Intell. in Engineeeing*, 15(2), 153–164
578. Mills K.L., Gomaa H. (2002) Knowledge-based automation of a design method for concurrent systems. *IEEE Trans. Soft. Eng.*, 28(3), 228–255
579. Minieka E. (1978) *Optimization Algorithms for Networks and Graphs.* Marcel Dekker, New York
580. Minsky M. (2000) Commonsense-based interfaces. *Comm. of the ACM*, 43(8), 67–73
581. Mirchandani P., Mishra A.K. (2002) Component commonality: models with product-specific service constraints. *Production and Oper. Manag.*, 11(2), 199–215
582. Mirkin, B.G. (1996) *Mathematical Classification and Clustering.* Kluwer Academic Publishers, Boston
583. Mirkin B.G. (2005) *Clustering for Data Mining: A Data Recovery Approach.* Chapman & Hall/CRC, New York
584. Mirkin B.G., Chernyi, L.B. (1970) On measurement of distance between partition of a finite set of units. *Automation and Remote Control*, 31, 786–792
585. Mirkin B.G., Roberts F.S. (1993) Consensus functions and patterns in molecular sequences. *Bulletin of Mathematical Biology*, 55, 695–713
586. Mirkin B.G., Muchnik I., Smith T. (1995) A biologically consistent model for comparing molecular phylogenies. *J. of Molecular Biology*, 2(4), 493–507
587. Miyasato G., Dong W., Levitt R., Boissounade A. (1986) Implementation of a knowledge based seismic risk evaluation system on microcomputers. *Artif. Intell. in Eng.,* 1(1), 29–35
588. Molina A., Sanchez J.M., Kusiak A. (eds) (1999) *Handbook of Life Cycle Engineering: Concepts, Models, and Technologies.* Kluwer Academic Publishers, Boston
589. Montello D. (1991) The measurement of cognitive distances: methods and construct validity. *J. of Environmental Psychology*, 11(2), 101–122
590. Moreno L., Aguilar R.M., Pifiero J.D., Estevez J.I., Sigut J.F., Gonzalez C. (2001) Using KADS methodology in a simulation assisted knowledge based system: application to hospital management. *Expert Syst. with Appl.*, 20(3), 235–249

591. Morgan C.L. (1927) *Emergent Evolution.* Northgate and Williams, London
592. Morisio M., Stamelos I., Tsoukias A. (2003) Software product and process assessment through profile-based evaluation. *Int. J. of Software Engineering and Knowledge Engineering*, 13, 495–512
593. Morse, D.V., Hendrickson, C. (1990) A communication model to aid knowledge-based systems. *AI EDAM*, 4(2), 99–115
594. Muhanna W.A., Pick R.A. (1994) Meta-modeling concepts and tools for model management: a systems approach. *Management Science*, 40(9), 1093–1123
595. Murata S., Yoshida E., Kirokawa H., Tomita K., Kokaji S. (2001) Concept of self-reconfigurble modular robotic system. *Artificial Intelligence in Engineering*, 15(4), 383–387
596. Myaeng S.H., Lopez-Lopez A. (1992) Conceptual graph matching: a flexible algorithm and experiments. *J. of Exper. and Theor. Artif. Intell.*, 4, 107–126
597. Nadler G. (1985) Systems methodology and design. *IEEE Trans. SMC*, 15(6), 685–697
598. Naeim F. (1989) *Seismic Design Handbook.* Van Nostrand Reinhold, New York
599. Nau D., Ball M., Baras J., Chowdhury A., Lin E., Meyer J., Rajamani R., Splain J., Trichur V. (2000) Generating and evaluating designs and plans for microwave modules. *AI EDAM*, 14, 289–304
600. Navinchandra D. (1991) *Exploration and Innovation in Design: Towards a Computational Model.* Springer, New York
601. Neap, H.S., Celik T. (2001) A knowledge-based system for determination of marginal value of building projects. *Expert Syst. with Appl.*, 21(3), 119–129
602. Nemhauser G.L., Trick, M.A. (1998) Scheduling a major college basketball conference. *Oper. Res.*, 46(1), 1–8
603. Newell A. (1980) Reasoning, problem solving and decision processes: the problem space as a fundamental category. In: Nickerson R. (ed), *Attention and Performance VIII.* Lawrence Erlbaum, Hillsdale, NJ
604. Newell A. (1981) The knowledge level. *Artif. Intell.*, (Summer) 1–19
605. Ng J.K.C., Ip W.H., Lee T.C. (1998) The development of an enterprise resources planning system using a hierarchical design pyramid. *J. of Intell. Manufact.,* 9(5), 385–399
606. Nielsen J. (1993) *Usability Engineering.* Academic Press, New York
607. Nierstrasz O., Gibbs S., Tsichritzis D. (1992) Component-oriented software development. *Comm. of the ACM*, 35(9), 160–165
608. Nihtila J. (1999) R & D – production integration in the early phases of new product development project. *J. of Eng. and Techn. Manage.*, 16(1), 55–81
609. Nijland G.O. (2002) The tetrahedron of knowledge acquisition: a meta-model of the relations among observation, conceptualization, evaluation and action in the research on socio-economical systems. *Systems Research and Behavior Science*, 19(3), 211–221
610. Nilsson N. (1971) *Problem Solving Methods in Artificial Intelligence.* McGraw Hill, New York
611. Nisnevich M. (1997) Improving lightweight concrete with bottom ash. *Concrete International*, 19(12), 56–60
612. Nisnevich M., Schlesinger T., Eshel Y. (1997) Use of porous aggregates containing radionuclides for light-weight concrete radiological aspects. In: *The 2nd Regional Mediterranean Congress on Radiation Protection*, Tel-Aviv, pp. 270–275
613. Nisnevich M., Kompaneetz B. (1998) Utilization of furnace bottom ash wastes from thermal power stations for lightweight concrete production. In: *Proc. of The 14th Conf.*, The Israel Mineral Science and Engineering Association, Beer-Sheva, pp. 139–159

614. Norman D.A. (1992) Design principles for cognitive artifacts. *Res. in Eng. Des.*, 4(1), 43–50
615. Norris M., Davis R., Pengelly A. (2000) *Component-Based Network System Engineering.* Artech House, Boston
616. Noy N.F., Musen M.A. (2004) Ontology versioning as an element of an ontology-management framework. *IEEE Intelligent Systems*, 19(4), 6–13
617. Oblinger D.A., Reid M., Brodie M., de Salvo Braz R. (2002) Cross training and its application to skills mining. *IBM Systems J.*, 41(3), 449–460
618. O'Leary D. (1998) Using AI in knowledge management: knowledge bases and ontologies. *IEEE Intell. Syst.*, 13(3), 34–39
619. Ong Y.S., Keane A.J. (2002) A domain knowledge based search advisor for design problem solving environments. *Eng. Appl. of Artif. Intell.*, 15(1), 105–116
620. Onkvisit S., Shaw K.J. (1999) *Product Life Cycles and Product Management.* Quorum Books, New York
621. Opricovic S., Tzeng G.-H. (2000) Applying MCDM to post-earthquake reconstruction. Presentation at *Int. Conference on Multicriteria Decision Making MCDM'2000*, Ankara, Turkey
622. Ore O. (1962) *Theory of Graphs.* American Mathematical Society, Providence
623. Otto K.N., Wood K.L. (1998) Product evolution: a reverse engineering and redesign methodology. *Res. in Eng. Des.*, 10(4), 226–243
624. Otto K.N., Wood K. (2001) *Product Design.* Prentice Hall, New York
625. Ouzzani M., Benatallah B., Bouguettaya A. (2000) Ontological approach for information discovery in internet databases. *Distr. and Paral. Databases*, 8(3), 367–392
626. Ozer M. (1999) A survey of new product evolution models. *The Intl. J. of Prod. Innovation Manag.*, 16(1), 77–94
627. Ozer M.N., Payton O.D., Nelson C.E. (2000) *Treatment Planning for Rehabilitation: A Patient-Centered Approach*, 2nd ed. McGraw-Hill, New York
628. Pahl G., Beitz, W. (1996) *Engineering Design. A Systematic Approach*, 2nd ed. The Design Council & Springer, London
629. Pal S.B. (ed) (1988) *Reviews on Immunoassay Technology.* Chapman and Hall, New York
630. Pallo J. (2000) An efficient upper bound of the rotation distance of binary trees, *Inform. Process. Lett.*, 73(3-4), 87–92
631. Palmer S.D. (1989) A new dimension for flat-file databases, *InfoWorld*, 11(5), 45–51
632. Palmer R.D. (1999) *Maintenance Planning and Scheduling Handbook.* McGraw-Hill, New York
633. Papalambros P., Michelena N. (1997) Partitioning in optimal design of large engineering systems. In: Alexandrov N., Hussani M. (eds), *Multidisciplinary Design Optimization: State-of-the Art.* SIAM, pp. 209–226
634. Papadimitriou C.H., Steiglitz K. (1982) *Combinatorial Optimization: Algorithms and Complexity.* Prentice Hall, NJ
635. Park J.H. (2000) Subsymmetry analysis of architectural design: Some examples. *Environments and Planning B: Planning and Design,* 27(1), 121–136
636. Parmee I.C. (2001) *Evolutionary and Adaptive Computing in Engineering Design.* Springer, Berlin
637. Parnas D.L. (1972) On the criteria to be used in decomposing systems into modules. *Comm. of the ACM,* 15(12), 1053–1058
638. Parola P. (2005) Inference in the SOOKAT object-oriented knowledge acquisition tool. *Knowledge and Information Systems*, 8(3) 310–329

639. Pasher E. (1999) *The Intellectual Capital of the State of Israel: A Look to the Future – The Hidden Value of the Desert.* Herzelia Pituah, Israel
640. Patrone C., Peskar B.A. (eds) (1987) *Radioimmunoassay in Basic and Clinical Pharmacology.* Springer, New York
641. Paulay C.D., Priestley M.J.N. (1992) *Seismic Design of Reinforcement Concrete and Masonary Buildings.* J. Wiley & Sons, New York
642. Pavlac R. (1990) All-in-one for the road. *InfoWorld*, 12(6), 55–67
643. Pearl J. (1986) *Heuristics.* Prentice-Hall, NJ
644. Pedersen M.K., Larsen M.H. (2001) Distributed knowledge management based on product state model – the case of decision support in health care administration. *Decision Support Syst.*, 31(1), 139–158
645. Pelillo M. (2002) Matching free trees, maximal cliques, and monotone game dynamics. *IEEE Trans. PAMI*, 24, 1535–1541
646. Pena-Mora F., Vadhavkar S., Dirisala S.K. (2001) Component-based software development for integrated construction management software applications, *AI EDAM*, 15(2), 173–187
647. Perry D.E., Wolf A.L. (1992) Foundations for the study of software architecture. *ACM SIGSOFT Soft. Eng. Notes*, 17, 40–52
648. Peterson K. (2000) Development of spatial decision support systems for residential real estate. *J. of Housing Res.*, 9(1), 135–156
649. Peterson J. (1977) Petri nets. *Computing Surveys*, 9(3), 223–252
650. Peterson J. (1980) A note on colored Petri nets. *Information Processing Letters*, 11(1), 40–43
651. Petreley N., Banapour Z., Slovick L. (1990) Analyzing relational databases, *InfoWorld*, 12(2), 51–68
652. Petreley N., Duncan J., Slovick L., Banapour Z. (1990) Relational power: part II. *InfoWorld*, 12(26), 56–61
653. Petrovsky J., Milutinovic Z. (1987) *Development of Vulnerability Functions and Models for Assessment of Urban Seismic Risk.* Institute for Earthquake Engineering and Engineering Seismology, University of Kiril and Metodij, Skopje
654. Petrowsky H. (1994) *Design Paradigm: Case Histories of Error and Judgment in Engineering.* Cambridge University Press, Cambridge, UK
655. Pevzner P.A. (2000) *Computational Biology: An Algorithmic Approach.* MIT Press, Cambridge
656. Phan D.D. (2001) Software quality and management. *Inform. Syst. Manag.*, 18(1), 56–67
657. Poole J., Campbell J.A. (1995) A novel algorithm for matching conceptual and related graphs. In: *Proc. of the Third Int. Conf. on Conceptual Structures,* LNCS 954. Springer, pp. 293–307
658. Prasad B. (1996) *Concurrent Engineering Fundamentals: Integrated Product and Process Organization.* Prentice Hall, NJ
659. Prasad B. (1999) Integration techniques of sharing and collaboration among work-groups, computers and process. *J. of Syst. Integration*, 9(2), 115–139
660. Prasad B (2000) Survey of life-cycle measures and metrics for concurrent product and process design. *AI EDAM*, 14(2), 163–176
661. Preiss B., Black R., Caron C., Shapcott D. (1992) Graphic summaries of expert knowledge for the medical curriculum: an experiment in second-year nephrology. *Methods of Information in Medicine*, 11, 303–309
662. Preiss B., Kaltenbach M., Zanezaka J., Echave V. (1992) Concept graphics: A language for medical knowledge. In: *Proc. of the 16th Annual Symp. on Computer Applications in Medical Care (SAMC'92)*, Baltimore, pp. 515–519

663. Pressman R. (1987) *Software Engineering*, McGraw-Hill, New York
664. Prisner E. (1995) *Graph Dynamics*. CRC Press, Boca Raton
665. Pruslin F.H., To S.E., Winston R., Rodman T.C. (1991) Caveats and suggestions for the ELISA. *J. Immunological Meth.*, 137, 27–35
666. Punakivi M., Yriola H., Holmstrom J. (2001) Solving the last mile issues: reception box or delivery box? *Int. J. of Physical Distribution & Logistics Management*, 31(6), 427–439
667. Raghavan S., Ball M.O., Trichur V.S. (2002) Bicriteria product design optimization: an efficient solution procedure using And/Or trees. *Naval Research Logistics*, 49(6), 574–592
668. Ramamoorthy C.V., Wah B.W. (1989) Knowledge and data engineering. *IEEE Trans. on Knowledge and Data Eng.*, 1(1), 9–16
669. Ramamoorthy C.V., Chandra C., Kim H.G., Shim Y.C., Vij V. (1992) Systems integration: problems and approaches. In: Ng P.A., *et al.* (eds), *The Second Int. Conf. on Systems Integration*, IEEE Computer Press, Los Alamitos, pp. 522–529
670. Rappoport A.M. (1978) Measurement of distance between weighted graphs of expert judgment. In: *Multicriteria Choice for Solving of Ill-structured Problems*, 5. Institute for System Analysis, Moscow, 97–108 (in Russian)
671. Ray T.S. (1996) Software evolution. *Systems, Control and Information*, 40, 337–343
672. Raymond J.W., Gardiner E.J., Willett P. (2002) Heuristic for rapid similarity searching of chemical graphs using a maximum common edge subgraph algorithm. *J. of Chem. Inf. Comput. Sci.*, 42, 305–316
673. Raymond J.W., Gardiner E.J., Willett P. (2002) RASCAL: calculation of graph similarity using maximal common edge subgraph. *The Computer J.*, 45(6), 631–644
674. Reddy Y.V.R., Srinivas K., Jagannathan V., Karinthi R. (1993) Computer support for concurrent engineering. *Computer*, 26(1), 12–15
675. Reeves C.R. (ed) (1993) *Modern Heuristic Techniques for Combinatorial Problems*. J. Wiley & Sons, New York
676. Regina A., Da Rocha C. (1989) Software quality assurance in HEP. *Computer Physics Comm.*, 26(1-3), 524–527
677. Reich Y. (1991) Design knowledge acquisition: task analysis and a partial implementation. *Knowledge Acquisition*, 3(3), 237–254
678. Reimann B.C., Waren A.D. (1985) User-oriented criteria for the selection of DSS software. *Comm. of the ACM*, 28(2), 166–179
679. Reinelt G. (1994) *The Traveling Salesman*. Springer, Berlin
680. Reiter R. (1987) A theory of diagnosis from first principles. *Artificial Intelligence*, 32(1), 57–95
681. Renhorn A.M. (1999) Toward performance based design in new earthquake engineering standards. In: *Proc. of The 7th National Congress of Earthquake Engineering*, Tel Aviv, pp. 3–8
682. Renner G., Ekart A. (2003) Genetic algorithms in computer aided design. *Computer-Aided Design* 35(8), 709–726
683. Reynolds M.T. (1997) *Test and Evaluation of Complex Systems*. J. Wiley & Sons, New York
684. Ribero C.C., Hanson P. (eds) (2001) *Essays and Surveys in Metaheuristics*. Kluwer Academic Publishers, Boston
685. Rice, J.R., Boisvert R.F. (1996) From scientific software libraries to problem-solving environments. *IEEE Comput. Sci. & Eng.*, 3(3), 44–53

686. Rinderle J.R. (1991) Grammatical approaches to engineering design, part II: melding configuration and parametric design using attribute grammars. *Res. in Eng. Des.*, 2(3), 137–146
687. Roberts F.R. (1976) *Discrete Mathematical Models with Applications to Social, Biological and Environmental Problems.* Prentice Hall, Englewood Cliffs, NJ
688. Roberts T.L. Jr, Gibson M.L., Fields K.T., Rainer R.K. Jr. (1998) Factors that impact implementing a system development methodology. *IEEE Trans. Soft. Eng.*, 24(8), 640–649
689. Robertson S., Robertson J. (1999) *Mastering the Requirements Process.* Addison-Wesley, Boston
690. Robertson D., Ulrich K. (1998) Planning for product platforms. *Sloan Manag. Review*, 39(4), 19–34
691. Robey D., Welke R., Turk D. (2001) Traditional, iterative, and component-based development: a social analysis of software development paradigms. *Inform. Techn. & Manag.*, 2(1), 53–70
692. Robinson D.F., Foulds L.R. (1981) Comparison of phylogenetic trees. *Math. Biosciences*, 53(1–2), 131–147
693. Rogers G.G., Bottaci L. (1997) Modular production systems: a new manufacturing paradigm. *J. of Intell. Manufact.*, 8(2), 147–156
694. Rohleder T.R., Silver E.A. (1997) A tutorial on business process improvement. *J. of Oper. Manag.*, 15(2), 139–154
695. Rook F.W., Croghan J.W. (1989) The knowledge acquisition activity matrix: a systems engineering conceptual framework. *IEEE Trans. SMC*, 19(3), 586–597
696. Rossi P.H., Freeman H.E., Lipsey M.W. (1999) *Evaluation: A Systematic Approach.* Sage Publications, London
697. Roth M.A., Wolfson D.C., Kleewein J.C., Nelin C.J. (2002) Information integration: a new generation of information technology. *IBM Syst. J.*, 41(4), 563–577
698. Rouse W.B. (1986) A note on the nature of creativity in engineering: implications for supporting system design. *Inform. Process. & Manag.*, 22(4), 279–285
699. Rouse W.B., Cannon-Bowers J.A., Salas E. (1992) The role of mental models in team performance in complex systems. *IEEE Trans. SMC*, 22(6), 1296–1308
700. Roy B. (1990) The outranking approach and foundations of ELECTRE methods. In: Bana e Costa C.A. (ed), *Readings in Multi-Criteria Decision Aid.* Springer, Berlin, 155–183
701. Roy B. (1996) *Multicriteria Methodology for Decision Aiding.* Kluwer Academic Publishers, Dordrecht
702. Roy R.H. (1986) *Operations Technology: Systems and Evolution.* Johns Hopkins Univiversity Press, Baltimore
703. Rubinstein R.Y., Kroese D.P. (2004) *The Cross Entropy Method: A Unified Approach to Combinatorial Optimization, Monte-Carlo Simulation and Machine Learning.* Springer, New York
704. Rus D. (1998) Self-reconfiguring robots. *IEEE Intell. Syst.*, 13(4), 2–4
705. Rutenberg A. (ed) (1994) *Proc. of the 17th Eur. Regional Seminar on Earthquake Engineering*, Haifa, Israel
706. Saaty T.L. (1988) *The Analytic Hierarchy Process.* MacGraw-Hill, New York
707. Sabin D., Weigel R. (1998) Product configuration frameworks – a survey. *IEEE Intell. Syst.*, 13(4), 42–49
708. Sage A.P. (1991) *Decision Support Systems Engineering.* J. Wiley & Sons, New York
709. Sage A.P. (1992) *Systems Engineering.* J. Wiley & Sons, New York

710. Sage A.P. (2000) Systems engineering education. *IEEE Trans on SMC, Part C*, 30(2) 164–174
711. Sage A.P., Rouse W.B. (eds) (1999) *Handbook of Systems Engineering and Management.* J. Wiley & Sons, New York
712. Sahal D. (1981) *Patterns of Technological Innovations.* Addison-Wesley, Reading, MA
713. Sait S., Youssef H. (1999) *Iterative Computer Algorithms with Applications in Engineering.* IEEE Press, NJ
714. Salvador F., Forza C., Rungtusanatham M. (2002) Modularity, product variety, production volume, and component sourcing: theorizing beyond genetic proscriptions. *J. of Oper. Manag.*, 20(5), 549–575
715. Samdani G., Ondrey G., Moore S. (1992) Predictive maintenance. *Chemical Eng.*, 99(11), 30–33
716. Sanchez R. (2000) Modular architecture, knowledge assets and organizational learning: new management processes for product creation. *Intl. J. of Techn. Manag.*, 19(6), 610–629
717. Sanchez R. (2002) *Modularity, Strategic Flexibility and Knowledge Management.* Oxford University Press, Oxford
718. Sanchez R., Mahoney J.T. (1996) Modularity, flexibility and knowledge management in product and organizational design. *Strategic Manag. J.*, 17, 63–76
719. Sanchez R., Collins R.P. (2001) Competing – and learning – in modular markets. *Long Range Planning*, 34(6), 645–667
720. Sanderson S.W., Uzumeri M. (1997) *Managing Product Families.* Irwin, Chicago.
721. Sause R., Powell G.H. (1991) A design process model for computer integrated structural engineering: design phases and tasks. *Eng. with Comp.*, 7(3), 145–160
722. Sawhney M.S. (1998) Leveraged high-variety strategies: from portfolio thinking to platform thinking. *J. of the Academy of Marketing Sci.*, 26(1), 54–61
723. Sawyer S., Guinan P.J. (1998) Software development: processes and performance. *IBM Syst. J.*, 37(4), 552–569
724. Saxena K.B.C. (1993) Computer-aided decision support engineering. In: Holsapple C.W., Whinston A.B. (eds), *Recent Developments in Decision Support Systems*, NATO ASI Series F 101. pp. 313–335
725. Scarlat A.S. (1996) *Approximate Methods in Structural Seismic Design.* Chapman and Hall, New York
726. Schierholt K. (2001) Process configuration: combining the principles of product configuration and process planning. *AI EDAM*, 15(5), 411–424
727. Schmalhofer F. (1997) *Constructive Knowledge Acquisition: A Computational Model and an Experimental Evaluation.* Lawrence Erlbaum, Hillsdale, NJ
728. Schmitt M., Teodorescu H.-N., Jain A. (eds) (2001) *Computational Intelligence Processing in Medical Diagnosis.* Physica Verlag, Berlin
729. Schneiderman B. (1980) *Software Psychology.* Winthrop Publishers, Cambridge, MA
730. Schniederjans M.J., Wilson R.L. (1991) Using the analytic hierarchy process and goal programming for information system project selection. *Inform. & Manag.*, 20, 333–342
731. Schreiber G., Wielinga B., Breuker J. (eds) (1993) *KADS: A Principled Approach to Knowledge-based System Development.* Academic Press, London
732. Schrijver A. (2003) *Combinatorial Optimization.* Springer, Berlin
733. Scott A.C., Clayton J.E. (1991) *A Practical Guide to Knowledge Acquisition.* Addison-Wesley, Boston

734. Seker R., Tanik M.M. (2004) An information-theoretical framework for modeling component-based systems. *IEEE Trans. on SMC, Part C*, 34(4), 475–484
735. Sekhniashvili M.L., Danielashvili M.A., Zhorzholadze T.A. (1992) *Recommendations for Investigating the Technical Conditions and Seismic Stability of Civil and Public Buildings in Georgia.* Tbilisi, pp. 1–140 (in Georgian)
736. Selby R.W. (1993) Interconnectivity analysis techniques or error localization in large systems. *J. Syst. Soft.*, 20(3), 267–272
737. Sen P., Yang J.-B. (1995) Multiple criteria decision making in design: selection and synthesis. *J. of Engineering Design*, 6(3), 207–230
738. Sen P., Yang J.-B. (1998) *Multiple Criteria Decision Support in Engineering Design.* Springer: Berlin
739. Sengupta J. (2000) *Dynamic and Stochastic Efficiency Analysis: Economics of Data Envelopment Analysis.* World Scientific, Singapore
740. Serzantov A.V. (1984) On optimal deciphering algorithm for a monotone function of algebraic logic. *Reports of Russian Academy of Sci.*, 277(2), 204–206 (in Russian)
741. Seward M.W., Lev A.M. (1985) The inportance of antibody affinity in the performance of immunoassays for antibody. *J. of Immunological Meth.*, 78, 173–190
742. Shakun M.F. (1988) *Evolutionary System Design: Policy Making Under Complexity and Group Decision Support Systems.* Holden Day Inc., Oakland, CA
743. Shahani A.K., Korve N., Jones K.P., Paynton D.J. (1994) Towards an operational model for prevention and treatment of asthma attacks. *J. of the Oper. Res. Soc.*, 45(8), 916–926
744. Shai O. (2001) The multidisciplinary combinatorial approach and its applications in engineering. *AI EDAM*, 15(2), 109–144
745. Shapiro L.G., Haralik R.M. (1981) Structural description and inexact matching, *IEEE Trans. PAMI*, 3, 504–519
746. Shaw M., Garlan D. (1996) *Software Architecture: Perspectives on an Emerging Discipline.* Prentice-Hall, Englewood Cliffs, NJ
747. Shearer K., Bunke H., Venkatesh S. (2001) Video indexing and similarity retrieval by largest common subraph detection using decision trees. *Pattern Recogn.*, 34(5), 1075–1091
748. Shenhar A.J. (1994) Systems engineering management: a framework for the development of a multidiciplinary discipline. *IEEE Trans. SMC*, 24(2), 327–332
749. Shenhar A.J. (1998) From theory to practice: toward a typology of project-management styles. *IEEE Trans. Eng. Manag.*, 45(1), 33–48
750. Shibata T., Yano M., Kodama F. (2005) Empirical analysis of evolution of product architecture. Fanuc numerical controllers from 1962 to 1997. *Research Policy*, 34(1), 13–31
751. Shilling M.A. (2000) Towards a general modular systems: theory and its application to interfirm product modularity. *Academy of Manag. Review*, 25, 312–324
752. Shirley G. (1990) Models for managing the redesign and manufacture of product sets. *J. of Manufact. Oper. Manag.*, 3, 85–104
753. Shortliffe E.H. (1976) *Computer-Based Medical Consultations: MICYN.* Elsevier, New York
754. Shoval P., Lugasi U. (1987) Models for computer systems evaluation and selection. *Inform. & Manag.*, 12(3), 117–129
755. Shoval P., Lugasi U. (1988) Computer systems selection: the graphical cost-benefit approach. *Inform. & Manag.*, 15, 163–172

756. Shubnikov A.V., Koptsik V.A. (1974) *Symmetry in Science and Art.* Plenum Press, New York
757. Siddal JN (1972) *Analytical Deision-Making in Engineering Design.* Prentice Hall, Englewood Cliffs, NJ
758. Siddique Z., Rosen D.W. (2001) On combinatorial design spaces for the configuration design of product family. *AI EDAM*, 15(2), 91–108
759. Simon H.A. (1977) *Models of Discovery and Other Topics in the Methodology of Science.* D. Reidel Publishing Company, Boston
760. Simon H.A. (1992) *The Science of Artificial*, 3rd ed. MIT Press, Cambridge, MA
761. Simon H., Newell A. (1958) Heuristic problem solving: the next advance in operations research. *Oper. Res.*, 6(1), 1–10
762. Simon H.A., Dantzig G.B., Hogarth R., Plott C.R., Raiffa H., Schelling T.C., Shepsle K.A., Thaler R., Tversky A., Winter S. (1987) Decision making and problem solving. *Interfaces*, 17(5), 11–31
763. Simpson T.W., Maier J.R.A., Mistree F. (2001) Product platform design: method and application. *Res. in Eng. Des.*, 13(1), 2–22
764. Skuce D., Lethbridge T. (1995) CODE4: a unified system for managing conceptual knowledge. *Int. J. of Human-Computer Studies*, 42, 413–451
765. Sloman A. (1998) The *semantic* of evolution: trajectories and trade-offs in design space and niche space. In: Coelho H. (ed), *Progress in Artificial Intelligence: Proc. of 6th Ibero-American Conf.*, LNCS 1484. Springer, Berlin, pp. 27–38
766. Smith B. (1996) Mereology – a theory of parts and boundaries. *Data and Knowledge Engineering*, 20(3), 287–303
767. Smith T.F., Waterman M.S. (1981) Identification of common molecular subsequencies. *J. of Molecular Biology*, 147, 195-197
768. Sobol I.M. (1992) An efficient approach to multicriteria optimum design problems. *Surveys on Math. in Industry*, 1, 259-281
769. Sobol I.M. (1994) *A Primer for the Monte Carlo Method.* CRC Press, Boca Raton
770. Soebarto V.I., Williamson T.J. (2001) Multi-criteria assessment of building performance: theory and implementation. *Building and Environment*, 36(6), 681–690
771. Soininen T., Stumptuer M. (eds) (2003) Special issue on configuration. *AI EDAM,* 17(2)
772. Somani A., Choy D., Kleewein J.C. (2002) Bridging together content and data management systems: challenges and opportunities. *IBM Syst. J.*, 41(4), 686–698
773. Sommerville I. (1989) *Software Engineering.* Addison-Wesley, MA
774. Sommerville I. (1989) Integrated project support environment (IPSE). *Microprocessors and Microsystems*, 13(4), 254–262
775. Sommerville I., Sawyer P. (1997) *Requirements Engineering: A Good Practice Guide*, 1st ed. J. Wiley & Sons, New York
776. Sokolova L.V., Furems E.M. (2000) Expert system for diagnosis of bronchial children asthma. *Computer Chronics*, 1, 103–118 (in Russian)
777. Song S., Dong A., Agogino A. (2002) Modeling information needs in engineering databases using tacit knowledge. *J. of Computing and Information Science in Engineering*, 2(3), 199–207
778. Song X., Osterweil L.J. (1992) Towards objective systematic design method comparisons. *IEEE Software*, 9(3), 43–53

779. Souder W.E., Ziegler R.W. (1977) A review of creativity and problem solving techniques. *Research Manag.*, 20(4), 34–42
780. Sowa J.F. (2002) Architectures for intelligence systems. *IBM Systems J.*, 41(3), 331–349
781. Sprague R.H., Carlson E.D. (1982) *Decision Support Systems.* Prentice-Hall, Cliffs, NJ
782. Sriram D., Logeher R. (1993) The MIT dice project. *Computer*, 64–65
783. Sproles N. (2002) Formulating measures of effectiveness. *Syst. Eng.*, 5(4), 253–263
784. Staab S., Schnurr H.-P., Studer R., Sure Y. (2001) Knowledge processes and ontologies. *IEEE Intell. Syst.*, 16(1), 26–34
785. Stamelos I., Tsoukias A. (2003) Software evaluation problem situations. Eur. J. of Oper. Res., 145, 273–286
786. Starr M.K. (1963) *Product Design and Decision Theory.* Prentice Hall, Englewood Cliffs, NJ
787. Statnikov R.B., Matusov J. (1995) *Multicriteria Optimization and Engineering.* Chapman and Hall, New York
788. Statnikov R.B. (1999) *Multicriteria Design: Optimization and Identification.* Kluwer Academic Publishers, Dordrecht
789. Steel M., Warnow T. (1993) Kaikoura tree theorem: computing the maximum agreement subtree. *Inform. Process. Lett.*, 48(2), 77–82
790. Stefanelli M. (2001) The socio-organizational age of artificial intelligence in medicine. *Artif. Intell. in Medicine*, 23(1), 25–47
791. Stenberg M., Werthen M., Theander S., Nygren H. (1990) A diffusion limited reaction theory for a microtiter plate assay. *J. Immunotechnological Meth.*, 132, 247–254
792. Stern L.A. (1997) Postmodular systems: architectural principles for cognitive robotics. *Cybernetics and Systems*, 28(6), 471–487
793. Steuer R.E. (1986) *Multiple Criteria Optimization: Theory, Computation, and Application.* J. Wiley & Sons, New York
794. Stevens R., Brook P., Jackson K., Arnold S. (1998) *Systems Engineering.* Prentice Hall, London
795. Stewart T. (1997) *Intellectual Capital: The New Wealth of Organizations*, Doubleday, New York
796. Stidolph W. (2000) Evolutionary design of complex software (EDCS). Demonstration days. *Software Eng. Notes*, 25(1), 95–108
797. Stilman B. (1993) Network languages for complex systems. *Int. J. Computers and Math. with Appl.*, 26(8), 51–79
798. Stilman B., Yakhnis V., Umanskiy O. (2002) Knowledge acquisition and strategy generation with LG wargaming tools. *Int. J. of Computational Intelligence and Applications*, 2(4), 385–410
799. Stiny G. (1991) The algebras of design. *Res. in Eng. Des.*, 2(3), 171–181
800. Stub A., Bard J.F., Globerson S. (1994) *Project Management: Engineering, Technology, and Implementation.* Prentice Hall, Englewood Cliffs, NJ
801. Stumptner M., Friedrich G.E., Haselbock A. (1998) Generative constraint-based configuration of large technical systems. *AI EDAM*, 12(4), 307–320
802. Stumptner M., Wotawa F. (2001) Diagnosing tree-structured systems. *Artif. Intell.*, 127(1), 1–29
803. Subbu R., Goebel K., Frederick D.K. (2005) Evolutionary design and optimization of aircraft engine controllers. *IEEE Trans. on SMC, Part C*, 35, (in press)
804. Suh N.P. (1990) *The Principles of Design.* Oxford University Press, New York

805. Suh N.P. (1998) Axiomatic design theory for systems. *Res. in Eng. Des.*, 10(4), 189–209
806. Suh N.P. (2001) *Axiomatic Design: Advances and Applications.* Oxford University Press, New York
807. Sussmann G.J. (1975) *A Computer Model of Skill Acquisition.* Elsevier, Amsterdam
808. Sutherland J.W. (1986) Assessing the artificial intelligence contribution to decision technology. *IEEE Trans. SMC*, 16(1), 3–20
809. Sykes E.A., White C.C. III (1989) Multiobjective intelligent computer-aided design. *IEEE Trans. SMC*, 21(6), 1498–1511
810. Tahan M., Ben-Asher J.Z. (2005) Modeling and analysis of integration processes for engineering systems. *Systems Engineering*, 8(1), 62–77.
811. Tai K.-C. (1979) The tree-to-tree correction problem. *J. of the ACM*, 26(3), 422–433
812. Tanaka E., Takemasa K., Masuda S. (1998) A distance measure for molecular structures and its computing method. *Pattern Recogn. Lett.*, 19(3–4), 373–381
813. Taura T., Kubota A. (1999) A study on engineering history base. *Res. in Eng. Des.*, 11(1), 45–54
814. Tavares L.V. (1995) On the development of educational policies. *Eur. J. of Oper. Res.,* 83(3), 409–421
815. Terenziani P., Molino G., Torchio M. (2001) A modular approach for representing and executing clinical guidelines. *Artif. Intell. in Medicine*, 23(3), 249–276
816. Thompson A., Layzell P., Zebulum R.S. (1999) Explorations in design space: unconventional electronics design through artificial evolution. *IEEE Trans. on Evolutionary Computation*, 3(3), 167–196
817. Tichy W. (ed) (1994) *Configuration Management.* J. Wiley & Sons, New York
818. Tillman F.A., Hwang C.-L., Kuo W. (1977) Optimization techniques for system reliability with redundancy – a review. *IEEE Trans. Reliability*, 26(3), 148–155
819. Timkovsky V.G. (1990) Complexity of common subsequence and supersequence problems and related problems. *Cybernetics*, 25, 565–580
820. Timpka T. (2001) Proactive health computing. *Artif. Intell. in Medicine*, 23(1), 13–24
821. Tockus L., Joskowicz L., Simkin A., Milgrom C. (1998) Computer-aided image-guided bone fracture surgery: modeling, visualization, and preoperative planning. In: *Proc. 1st Int. Conf. on Medical Image Computing and Computer-Assisted Intervention*, LNCS 1496, Springer, pp. 29–38
822. Todd D.S. (1997) *Multiple criteria genetic algorithms in engineering design and operation.* PhD Thesis, University of New Castle, Australia
823. Tomer A., Schach S.R. (2002) A three-dimensional model for system design evolution. *Syst. Eng.*, 5(4), 264–273
824. Tomes A., Erol R., Armstrong P. (2000) Technological entrepreneurship integrating technological and product innovation. *Technovation*, 20(3), 115–127
825. Tong Ch., Sriram D. (eds) (1992) *Artificial Intelligence in Engineering Design: Knowledge Acquisition, Commercial Systems, and Integrated Environments.* Academic Press, New York
826. Trakhtenbrot B.A., Barzdin Y.M. (1973) *Finite Automata: Behaviour and Synthesis.* North Holland, Amsterdam
827. Trinkaus H.L., Hanne Th. (2005) knowCube: a visual and interactive support for multicriteria decision making. *Computers & Oper. Res.*, 32(5), 1289–1309

828. Tsa C.-H., Hsu D.-S. (1999) Damage diagnosis of existing reinforced concrete structures. In: *Proc. of The Fifth Int. Conf. on The Application of AI in Civil and Structural Eng.*, Edinburgh, pp. 85–92
829. Tsa C.-H., Hsu D.-S. (2001) Synthetic damage assessment for RC structure based on fuzzy logic. In: Monostori L., Vancza J., Ali M. (eds), *Engineering of Intelligent Systems*, LNCS 2070. Springer, Berlin, pp. 339–348
830. Tsai C.-J., Tseng S.S. (2002) Building a CAL expert system based upon two-phase knowledge acquisition. *Expert Systems and Applications*, 22(3), 235–248
831. Tsai Y.-T., Wang K.-S. (1999) The development of modular-based design in considering technology complexity. *Eur. J. of Oper. Res.*, 119(3), 692–703
832. Tsoukias A. (2003) *From decision theory to decision aiding methodology.* DIMACS Technical Report, 2003-21, Rutgers University, NJ
833. Tsoukias A. (2005) On the concept of decision aiding process. *Annals of Operations Research*, (in press)
834. Tsukune H., Tsukamoto M., Matsushita T., Tomita F., Okeda K., Ogasawara T., Takese K., Yuba T. (1993) Modular manufacturing. *J. of Intell. Manufact.*, 4(2), 163–181
835. Tudor F.D., Ciuhandu G.C. (1992) Design principles concerning the strengthening of coupling beams. In: *Proc. of the 10th World Congress on Earthquake Eng.,* vol. 9, Madrid, pp. 5127–5130
836. Turban E. (1990) *Decision Support System and Expert System: Management Support System*, 2nd ed. Macmillan, New York
837. Turing A. (1936) On computable numbers with an application to the Enscheidungsproblem. *Proc. of Lond. Math. Soc.,* XLII, 239–265 (with correction, *ibid* (1937) XLIII, 544–546)
838. Tversky A. (1977) Features of similarity. *Psychological Review*, 84(4), 327–352
839. Ueda K., Vaario V., Ohkura K. (1997) Modeling of biological manufacturing systems for dynamic reconfiguration. *Ann. CIRP*, 46(1), 343–346
840. Ueda K. (2000) Emergent synthesis. In: Shpitalni M. (ed), *2000 Intl. CIRP Seminar*, Haifa, Israel, pp. 9–16
841. Ueda K. (2001) Synthesis and emergence - research overview. *Artif. Intell. in Engineering*, 15(4)321–327
842. Ulaby F.T., Director S.W. (eds) (2000) Special issue on electrical and computer engineering education. *Proc. of the IEEE*, 88(1)
843. Ulrich K.T., Eppinger S.D. (1999) *Product Design and Development*, 2nd ed. Irwin/McGraw-Hill, New York
844. Ulungu E.L., Teghem J. (1994) Multi-objective combinatorial optimization problems: a survey. *J. of Multi-Criteria Decision Analysis*, 3(2), 83–104
845. *United States Patent 5,772,751* (1998) Cement-bound light-weight insulating structural monolitical aggregate concrete, June 30
846. Uschold M., Gruninger M. (1996) Ontologies: principles, methods and applications. *The Knowledge Engineering Review*, 11(2), 93–136
847. Usher J.S., Kamal A.H., Syed W.H. (1998) Cost optimal preventive maintenance and replacement scheduling. *IIE Trans.*, 30, 1121–1128
848. Van Bemmel J.H., Gremy F., Zvarova J. (eds) (1985) *Medical Decision Making. Diagnostic Strategies and Expert Systems.* Elsevier, Amsterdam
849. Van Gigch J.P. (1978) *Applied General Systems Theory*, 2nd ed., Vols. 1 and 2. Harper and Row Publishers
850. Van Hentenryck P. (1997) Constraint programming for combinatorial search problems. *Constraints*, 2(1), 99–101
851. Van Ryzin J. (ed) (1977) *Classification and Clustering.* Academic Press, New York

852. Van Schijndel S., Pistikopoulos E.N. (2000) Towards the integration of process design, process control, and process operability: current status and future trends. In: Malone M.F., Trainham J.A., Carnhan B. (eds), *Foundations of Computer-Aided Process Design, AIChE Symposium Series*, No. 323, 96, American Institute of Chemical Engineers, pp. 99–112
853. Van Tassel D. (1978) *Program Style, Design, Efficiency, Debugging, and Testing.* Prentice-Hall, Englewood Cliffs, NJ
854. Varzi A. (1996) Parts, wholes, and part-whole relations. *Data and Knowledge Engineering*, 20(3), 259–286
855. Vassilakopoulos M., Manolopoulos Y. (1994) Analytical comparison of two spatial data structures. *Information Systems*, 19(7), 569–582
856. Venter F.J., Oosthuizen G.D., Roos J.D. (1997) Knowledge discovery in databases using lattices. *Expert Syst. with Appl.*, 13(4), 259–264
857. Vetschera R., Walterscheid H. (1993) Graphical interaction in multi-criteria decision support: some implementation issues. In: Wessels J., Wierzbicki A.P. (eds), *User-Oriented Methodology and Technology of Decision Analysis and Support.* Lecture Notes in Economics and Mathematical Systems, Vol. 397. Springer, Vienna, pp. 79–87
858. Vico F.J., Veredas F.J., Bravo J.M., Almaraz J. (1999) Automatic design synthesis with AI techniques. *Adv. Eng. Des.*, 13(3), 251–256
859. Vincke Ph. (1982) Aggregation of preferences: a review. *Eur. J. of Oper. Res.*, 9, 17–22
860. Vincke Ph. (1992) *Multicriteria Decision Aid.* J. Wiley & Sons, New York
861. Vitharana P., Jain H., Zahedi F.M. (2004) Strategy-based design of reusable business components. *IEEE Trans. SMC, Part C*, 34(4), 460–474
862. Vlahavas I., Stamelos I., Refanidis I., Tsouskias A. (1999) ESSE: an expert system for software evaluation. *J. of Knowledge Based Systems*, 12, 183–197
863. Voss S., Martello S., Roncairol C., Osman, I.H. (1999) *Meta-Heuristics: Advances and Trends in Local Search Paradigm for Optimization.* Kluwer Academic Publishers
864. Wagner R.A., Fischer M.J. (1974) The string-to-string correction problem. *J. of the ACM*, 23(1), 31–42
865. Waiyamai K., Taouil R., Lakhal L. (1997) Towards an object database approach for managing concept lattices. In: Embley D.W., Goldstein R.C. (eds), *Conceptual Modeling – ER'97*, LNCS 1331. Springer, Berlin, pp. 299–312
866. Wakabayashi M. (1984) *Design of Earthquake-Resistant Building.* McGraw-Hill, New York
867. Waller R.J. (1976) The synthesis of hierarchical structures: techniques and applications. *Decision Sci.*, 7, 659–674
868. Wallis W.D., Shoubridge P., Kraetz M., Ray D. (2001) Graph distances using graph union. *Pattern Recogn. Lett.*, 22(6-7), 701–704
869. Wang J., Malakooti B. (1992) A feedforward neural network for multiple criteria decision making. *Comp. & Oper. Res.*, 19(2), 151–167
870. Wang L., Shen W., Xie H., Neelamkavil J., Pardasani A. (2002) Collaborative conceptual design – state of the art and future trends. *Computer-Aided Design* 34(13), 981–996
871. Wang Y., Ishii N. (1997) A method of similarity metrics for structured representations. *Expert Syst. with Appl.*, 12(1), 89–100
872. Warshavsky A., Gluck J., Segal D. (1996) Economic aspects of seismic design. *J. of Structural Eng., ASCE,* 122(12), 1400–1408
873. Weiss C.H. (1997) *Evaluation.* Prentice Hall, Englewood Cliffs, NJ

874. Werman M., Peleg S., Rosenfeld A. (1985) A distance metric for multidimensional histograms. *Comput. Vision, Graph., Image Processing*, 32, 328–336
875. Wert M. (1961) *Productive Thinking.* Tavistock Publications, London
876. White C.C. (1990) A survey on the integration of decision analysis and expert systems for decision support. *IEEE Trans. SMC*, 20(2), 358–364
877. Wiegers K.E. (2003) *Software Requirements*, 2nd ed. Microsoft Press
878. Wielinga B.J., Schreiber A.Th., Breuker J.A., (1992) KADS: a modeling approach to knowledge engineering. *Knowledge Acquisition*, 4(1), 5–53
879. Wielinga B.J., Schreiber A.Th. (1997) Configuration design problem solving. *IEEE Expert*, 12(2), 49–56
880. Wiig K.M. (1997) Integrating intellectual capital and knowledge management. *Long Range Planning*, 30(3), 399–405
881. Wild D. (ed) (2000) *Immunoassay Handbook*, 2nd ed. Nature Publishing Group, London
882. Wille R. (1992) Concept lattices and conceptual knowledge systems. *Computers Math. Applications*, 23, 493–515
883. Willet P. (1999) Matching of chemical and biological structures using subgraphs and maximal common subgraphs isomorphism algorithms. *IMA Vol. Math. Appl.*, 108, 11–38
884. Williams A. (1997) *Seismic Design of Buildings and Bridges: For Civil and Structural Engineers.* Engineering Press, New York
885. Williams T. (1994) New CAE tools aimed at coordinating complex projects. *Computer Design*, 33(5), 65–68
886. Wilson R.J. (1972) *Introduction to Graph Theory.* Oliver & Boyd
887. Wireman T. (2004) *Total Productive Maintenance.* Industrial Press
888. Wirth N. (1976) *Systematic Programming. An Introduction*, Prentice-Hall, Englewood Cliffs, NJ
889. Wolsey L.A., Nemhauser G.L. (1999) *Integer and Combinatorial Optimization.* J. Wiley & Sons, New York
890. Wong A., Sriram D. (1993) SHARED: an information model for cooperative product development. *Res. in Eng. Des.*, 5(1), 21–39
891. Wood N.K. (1999) *Review of Diagnosis, Oral Medicine, Radiology, and Treatment Planning.* Mosby-Year Book, Inc. Saint Louis, MO
892. Wynants Gh. (2001) *Network Synthesis Problems.* Kluwer, Boston
893. Yao J.F.-F., Yao J.-S. (2001) Fuzzy decision making for medical diagnosis based on fuzzy number and compositional rule of inference. *Fuzzy Sets and Syst.*, 120(2), 351–366
894. Yasar O., Landau R.H. (2003) Elements of computational science and engineering education. *SIAM Review*, 45(4), 787–805
895. Yerramareddy S., Lu S.C.-Y. (1993) Hierarchical and interactive decision refinement methodology for engineering design. *Res. in Eng. Des.*, 4(4), 227–240
896. Yewlett C.J.L. (2001) OR in strategic land-use planning. *J. of the Oper. Res. Soc.*, 52(1), 4–13
897. Yigit A.S., Ulsoy A.G., Allahverdi A. (2002) Optimizing modular product design for reconfigurable manufacturing. *J. of Intell. Manufact.*, 13(2), 309–316
898. Yong R.R. (2004) *The Requirements Engineering Handbook.* Artech House, Boston
899. Yourdan E. (1975) *Techniques of Program Structure and Design.* Prentice-Hall, Englewood Cliffs, NJ
900. Zack M. (1999) Managing codified knowledge. *Sloan Manag. Review*, 40(4), 45–58

901. Zakarian A., Kusiak A. (2001) Process analysis and reengineering. *Comp. & Ind. Eng.*, 41(2), 135–150
902. Zakarian A., Rushton G.J. (2003) Development of modular electrical systems. *IEEE–ASME Trans. on Mechatronics*, 6(4), 507–520
903. Zang W. (1999) *State Space Search: Algorithms, Complexity, Extensions, and Applications.* Springer, New York
904. Zapounidis C., Doumpos M. (2002) Multi-criteria decision aid in financial decision making: Methodologies and literature review. *J. of Multi-Criteria Analysis*, 11(4–5), 167–186
905. Zaslavsky Y., Shapira A. (1997) *Dynamic characteristics of low rise buildings in Eilat using seismic measurements.* Report No. 550/87/96 (118), The Geophysical Institute of Israel
906. Zave P. (1997) Classification of research efforts in requirements engineering. *ACM Comput. Surveys*, 29(4), 315–321
907. Zeichik A.L. (1989) Integrated software. *InfoWorld*, 11(33), 45–60
908. Zhang K, Wang J.T.L., Shasha D. (1996) On the editing distance between undirected acyclic graphs. *Int. J. Foundations of Comp. Sci.*, 7(1), 43–57
909. Ziegler C.A. (1983) *Programming System Methodologies*, Prentice-Hall, Englewood Cliffs, NJ
910. Zilberstein S. (1996) Using anytime algorithms in intelligent systems. *AI Magazine*, 17(3), 73–83
911. Zitzler E., Deb K., Thiele L., Coello C.A. (eds) (2001) *Evolutionary Multi-Criterion Optimization*, LNCS 1993. Springer, Berlin
912. Zupancic J., Wojtkowski W. (eds) (1999) *Evolution and Challenges in System Development.* Plenum, New York
913. Zuse H. (1990) *Software Complexity: Measures and Methods.* Walter de Gruer & Co., New York
914. Zwicky F. (1969) *Discovery Invention, Research Through the Morphological Approach.* McMillan, New York

# About the Author

**Dr Mark Sh. Levin** received the M.S. degree in Radioengineering from Moscow Technological University for Communication and Informatics (1970), the M.S. degree in Mathematics from *M.V. Lomonosov* Moscow State University (1975), the Ph.D. degree in Systems Analysis and Combinatorial Optimization from the Institute for Systems Analysis of the Russian Academy of Sciences (1982). From 1970 to 1983 he was with Moscow R & D organizations as an Engineer, a Senior Engineer, and Head of Laboratory (algorithms for air-traffic control, software & information engineering for government and industry, management and decision support systems). After that he conducted his (mainly independent) research projects as a Researcher (Senior Researcher, Leading Researcher, Independent Researcher, Visiting Researcher/Scholar) in Russia (Research Institute for Normalization in Machine-Building, the Russian Academy of Sciences), Japan (The University of Aizu), Canada (University of Ottawa, University of Toronto), and Israel (Ofakim Center of Technology, The Ariel College, The Ben-Gurion University). Now, Dr Levin is with the Institute for Information Transmission Problems of the Russian Academy of Sciences (Moscow) as a Senior Scientific Researcher. Dr Levin has multiyear experience in advanced development and in leadership roles for advanced systems development projects.

# Index