107707423824 33152244219 1008671.6538462 24725161.728814 39451547798 54734109858 31992950808 3817700 21259039.133333 76983761890 102357906000 28230897300 6493965541 108589514733 13488806.782609 92255026.25 181995865.77778 18661638.568421 78276943122 167214057520 122714916480 15208823616 1215744299 28770924515 17656030.933333 23885183.263889 98065473660

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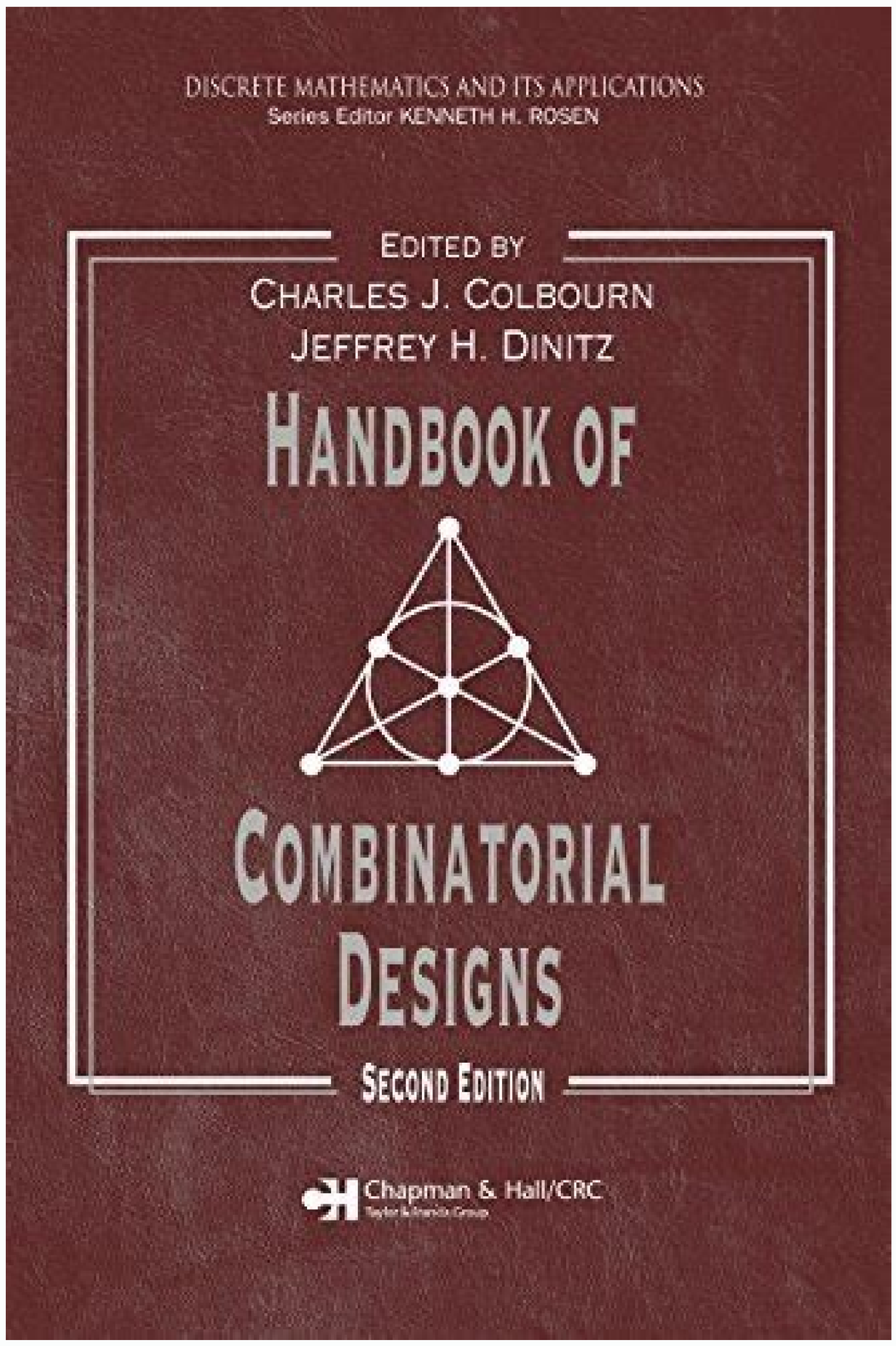


CHAPTER 2
FUNDAMENTALS OF LOGIC

Section 2.1

1. The sentences in parts (a), (c), (d), and (f) are statements.

2. The statements in parts (a), (c), and (f) are primitive statements.

3. Since $p \to q$ is false the truth value for p is 1 and that of q is 0. Consequently, the truth values for the given compound statements are

   (a) 0 (b) 0 (c) 1 (d) 0

4. (a) $r \to q$ (b) $q \to p$ (c) $(s \wedge r) \to q$

5. (a) If triangle ABC is equilateral, then it is isosceles.
   (b) If triangle ABC is not isosceles, then it is not equilateral.
   (c) Triangle ABC is equilateral if and only if it is equiangular.
   (d) Triangle ABC is isosceles but it is not equilateral.
   (e) If triangle ABC is equiangular, then it is isosceles.

6. (a) True (1) (b) False (0) (c) True (1)

7. (a) If Darci practices her serve daily then she will have a good chance of winning the tennis tournament.
   (c) If Mary is to be allowed on Larry's motorcycle, then she must wear her helmet.

8.

p	q	$p \vee q$	(a) $\neg(p \vee \neg q) \leftrightarrow \neg p$	$p \to q$	$q \to p$	(d) $(p \to q) \to (q \to p)$
0	0	0	1	1	1	1
0	1	1	1	1	0	0
1	0	1	1	0	1	1
1	1	1	1	1	1	1

9.

p	q	$p \to q$	$p \wedge (p \to q)$	(c) $(p \wedge (p \to q)) \to q$	(f) $\neg q \wedge$
0	0	1	0	1	0

Con. 297-BQ-7022-19. 2

(c) Prove that a convergent sequence has a unique limit.

(d) Check if the following sequences converge by using Sandwich Theorem.

i. $(x_n) = \left(\frac{\sin n}{n}\right)$ ii. $(x_n) = \left(\frac{2n}{n^2+1}\right)$

(e) Find limit point/s of following sets:

i. $\left\{\frac{1}{3^n} / n \in \mathbb{N}\right\}$ ii. $\left\{1 + \frac{(-1)^{n+1}}{n} / n \in \mathbb{N}\right\}$

(f) Prove that if $\sum a_n$ is a convergent then $\lim_{n \to \infty} a_n = 0$

Q.3 Attempt any **four** questions from the following. 16

(a) Find Particular solution of $(2D^2 + 5D + 3)y = 0$,y(0)=3 ,$y'(0) = -4$

(b) Solve $(D^2 - 2D - 3)y = e^{4x}$ by using Undetermined Coefficients.

(c)Solve $Cos^2x \frac{dy}{dx} + y = \tan x$

(d) Solve $(D^2 + 9)y = Sec3x$ by using Variation of Parameters.

(e)Solve $(x + 2)Sin y\, dx + x\, Cos\, y\, dy = 0$

(f)Show that $y_1(x) = e^{\frac{-x}{2}} Sin(\frac{\sqrt{3}}{2}x)$ & $y_2(x) = e^{\frac{-x}{2}} Cos(\frac{\sqrt{3}}{2}x)$ are Linearly Independent.

Q.4 Attempt any **four** questions from the following. 16

(a)Find the Volume of Solid Bounded by $Z = x^2 + y^2$ & Z=4

(b) Solve the Double integral $\int_0^1 \int_0^x x^2\, y\, dydx$

(c) Evaluate $\oint ydx - xdy$ over a Triangle bounded by y=0, x+y=1 & x=0

15. (a) Write down the minterm normal form of $f(x_1, x_2) = \bar{x}_1 \vee \bar{x}_2$.

Or

(b) Let B be the Boolean algebra $\{0, 1\}$ with the usual $\wedge, \vee$ operations, and B be any given finite Boolean algebra. Let $p, q \in P_n$. If $p_B = q_B$, then prove that $p_B = q_B$.

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Show that $(Z_n, +n)$ is an abelian group.

17. Write the recurrence relation for Fibonacci numbers and solve it.

18. Solve the recurrence relation $S(n) = S(n-1) + 2(n-1)$ with $S(0) = 3, S(1) = 1$ by finding its generating function.

19. Let L be a complemented distributive lattice. For $a, b \in L$, prove that the following are equivalent.

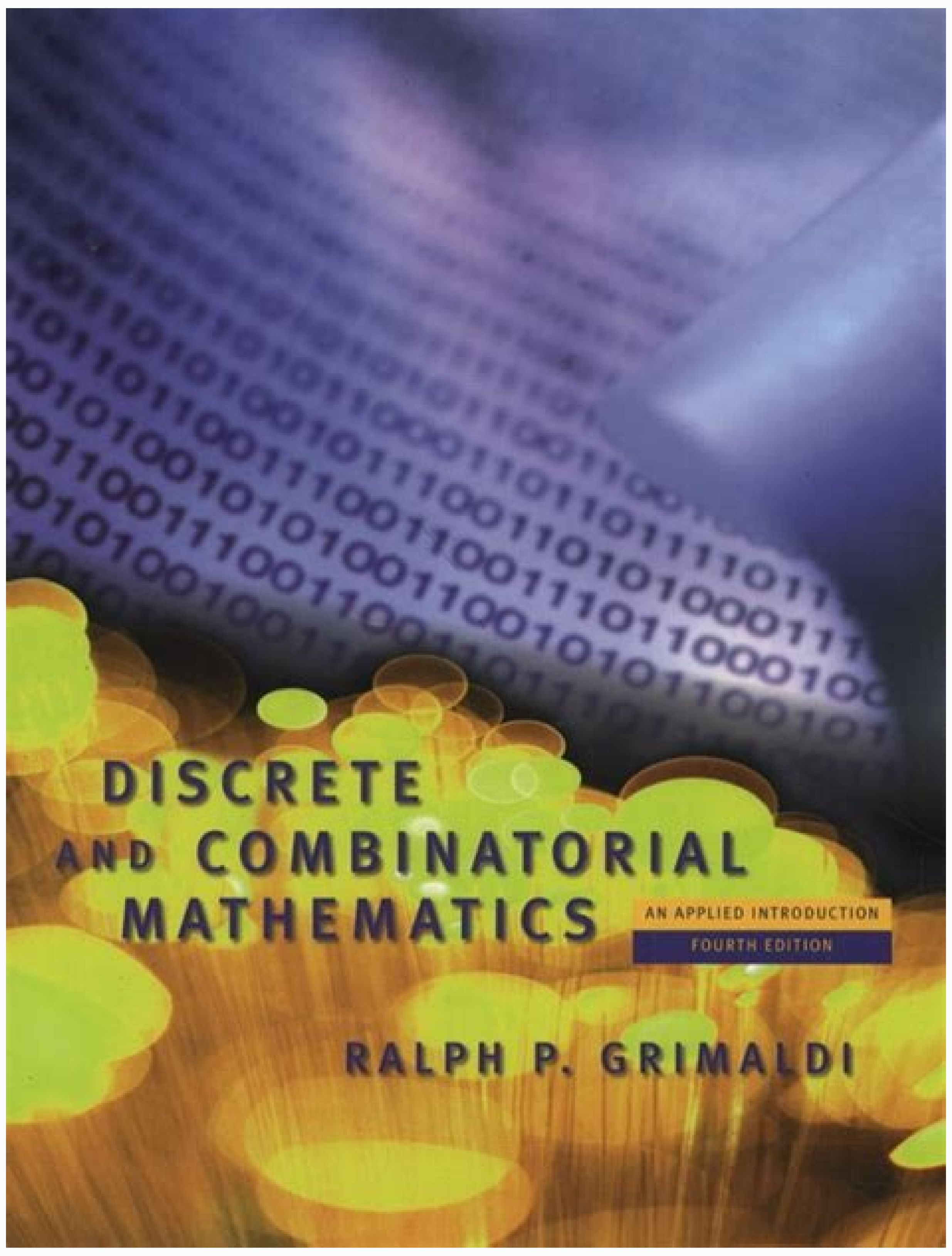
(a) $a \leq b$

(b) $a \wedge b' = 0$

(c) $a' \wedge b = 1$

(d) $b' \leq a'$.

20. Describe the addition of two one-digit binary numbers.



Deb, S. Solving the winner determination problem via a weighted maximum clique heuristic. Polynomial unconstrainted binary optimisation - Part II. International Journal of Metaheuristics 1(4): 317-354, 2011. (Eds.) SEAL 2012, Lecture Notes in Computer Science 7673: 128-137, 2012.(pdf) Springer Yang Wang, Zhipeng Lu, Fred Glover, Jin-Kao Hao. A Multilevel Algorithm for Large Unconstrained Binary Quadratic Optimization. (Eds.): EvoCOP 2011, Lecture Notes in Computer Science 6622: 72-83, 2011. Benchmark instances are HERE.Nicolas Pech-Gourg, Jin-Kao Hao, Métaheuristiques pour l'optimisation de règles de classification de bouchons naturels en liege. Fermé and J. Breakout local search for the quadratic assignment problem. Breakout local search for maximum clique problems. Kuntz, Polytech'Nantes, joint Master of the Polytech'Nantes and the University of Politehnica de Bucarest, Romania, PhD Sept. Selected papers from AE-01, Lecture Notes in Computer Science 2310: 168-179, Springer-Verlag, 2002. 2006, graduate of Universidade Federal de Santa Catarina, Brazil) Herve Deleau (Research Engineer at University of Reims Champagne-Ardenne, PhD defense in 2005, graduate of University of Amiens, co-supervisor F. Iterated multilevel simulated annealing for large-scale graph conductance minimization. 2010 - December 2013) Philippe Galinier (Professor at the Ecole Polytechnique de Montreal, Canada, PhD defense in 1999, graduate of University of Montpellier II) Adrien Goëffon (Associate Professor at the University of Angers, co-supervisor J.M. Richer, PhD Oct. on Tools for Artificial Intelligence (ICTAI-90), pp494-500, Washington D.C., Nov. A review of algorithms for maximum clique problems. European Journal of Operational Research242(3): 693-709, 2015 (pdf, doi) Elsevier. Yuning Chen and Jin-Kao Hao. Expert Systems with Applications 42(1): 584-595, 2015. Xiangjing Lai and Jin-Kao Hao. He has initiated a number of large R&D projects including an EC funded Esprit project (96-99) and French National Research Network RNRT project (1999-2002). (pdf, doi) Elsevier Qinghua Wu, Jin-Kao Hao, Fred Glover. (pdf, doi) IEEE CSP. Computers & Operations Research 86: 65-78, 2017 (pdf, doi)Elsevier (Program Code is HERE) Yi Zhou, Jin-Kao Hao, Adrien Goëffon. 2014 - December 2017, co-supervisor Dr. B. In silico evaluation of the influence of the translocon on partitioning of membrane segments. BMC Bioinformatics 15:156, (pdf, doi) 2014. Minimum sum coloring for large graphs with extraction and backward expansion search. Knowledge guided local search for the Prize-collecting Steiner Tree Problem in Graphs. Zuo-cheng Li (2019-2021, visiting PhD student from Northeastern University, supervised by Prof. Cutello, K. Computers & Operations Research 35(10): 3331-3346, 2008. Distance-guided local search. International Journal of Applied Metaheuristic Computing 1(3): 20-36, 2010. Computers & Operations Research 127: 105131, March 2021 (pdf, doi)Elsevier (Program Code is HERE)Yangming Zhou, Jin-Kao Hao, Zhang-Hua Fu, Zhe Wang, Xiangjing Lai. 1995. (pdf) Springer Jin-Kao Hao, A clausal genetic representation and its related evolutionary procedures for satisfiability problems. Knowledge-Based Systems 125: 26-38, 2017 (pdf, doi)Elsevier (Program Code is HERE) Fuda Ma, Yang Wang, Jin-Kao Hao. Qinghua Wu and Jin-Kao Hao. (Program Code is HERE) Yangming Zhou, Béatrice Duval, Jin-Kao Hao. Michel Vasquez and Jin-Kao Hao, A "logic-constrained" knapsack formulation and a Tabu algorithm for the daily photograph scheduling of an earth observation satellite. Lecture Notes in Computer Science 3871: 73-84, Springer-Verlag, 2006. Finke (Ed.), Operational Research and Networks, Chapter 7, Wiley, 2008. Rongqiang Zeng, Matthieu Basseur, Jin-Kao Hao. A two-phase tabu-evolutionary algorithm for the 0-1 multidimensional knapsack problem. Computers & Operations Research 134: 105362, 2021 (pdf, doi)Elsevier. (Program Code is HERE)Pengfei He, Jin-Kao Hao, Qinghua Wu. Grouping memetic search for the colored traveling salesmen problem. EMO-03, Lecture Notes in Computer Science 2632: 88-101, Springer-Verlag, 2003. RAIRO Operational Research 39:87-103, 2005. Journal of Tsinghua Science and Technology, 8(1): 8-13, 2003. Draft (pdf,doi) Springer Fred Glover, Jin-Kao Hao, Gary Kochenberger. (pdf) Springer Raphaël Dorne and Jin-Kao Hao, Constraint handling in evolutionary search: a case study on frequency assignment. Cardoso, Sheth, Amit (Eds.) Semantic Web Services, Processes and Applications, Chapter 8, 2006, (pdf), Springer Jean-Philippe Hamiez, Jin-Kao Hao, An analysis of solution properties of the graph coloring problem. Metaheuristics: Computer Decision-Making, Chapter 15, pp325-346, M.G.C. Resende and J.P. de Sousa (Eds.), Kluwer, 2003. (pdf, doi)IEEE CSP.Xiangjing Lai, Jin-Kao Hao, Zhang-Hua Fu, Dong Yue. Yang Wang, Zhipeng Lü, Fred Glover, Jin-Kao Hao.Backbone guided tabu search for solving the UBQP problem. Journal of Heuristics19(4): 679-695, 2013(pdf, doi) Springer Wassim Ayadi, Mourad Elloumi, Jin-Kao Hao. BiMine+: An efficient algorithm for discovering relevant biclusters of DNA microarray data.Knowledge-based Systems 35: 224-234, 2012. Annals of Operations Research 238:651-657, 2016 (pdf, doi) Springer Yi Zhou, Jin-Kao Hao, Adrien Goëffon. Accepted to European Journal of Operational Research 297(1): 27-39, 2022(pdf, doi) Elsevier. (Program Code is HERE).Qing Zhou, Jin-Kao Hao, Qinghua Wu. A hybrid evolutionary search for the generalized quadratic multiple knapsack problem. A clique-based exact method for optimal winner determination in combinatorial auctions. Lecture Notes in Computer Science 4926: 243-254, Springer, 2008. (pdf, doi) Elsevier Una Benlic and Jin-Kao Hao. (The drwaing software tool is available here). Gaspar-Cunha et al. (pdf, doi), Elsevier Benoit Laurent and Jin-Kao Hao. 2003, graduate of University of Angers) Meriema Belaidouni (PhD defense in 2001, graduate of the University of Houari Boumediene, Algeria) Una Benlic (Research Scientist, Tesco PLC, London, UK, PhD study Oct 2009 - Sept. Punnen (Ed.) The Quadratic Unconstrained Binary Optimization Problem: Theory, Algorithms, and Applications, Chapter 9, pages 209-225, 2022. Hybrid metaheuristics for the graph partitioning problem. Journal of Combinatorial Optimization 28(1): 58-81, 2014. (pdf, doi) Springer Yan Jin, Jin-Kao Hao, Jean-Philippe Hamiez. A genetic embedded approach for gene selection and classification of microarray data. Applied Soft Computing6:10-19, 2014. (pdf, doi) Elsevier. Journal of Combinatorial Optimization 7(1): 87-103, 2003. European Journal of Operational Research231(2): 452-464, 2013. Computational Optimization and Applications 50(3): 483-506, 2011. (pdf,doi) Springer Fred Glover and Jin-Kao Hao. Journal of Heuristics 7(5): 443-472, 2001. Information Sciences 352-353: 15-34,.2016 (pdf, doi)Elsevier. Coloring large graphs based on independent set extraction. Computers & Operations Research39(2): 283-290, 2012. Lecture Notes in Artificial Intelligence 5027: 466-475, Springer, 2008, Draft (pdf) Springer Benoit Laurent and Jin-Kao Hao, A study of neighborhood structures for the multiple depot vehicle scheduling problem. Computers & Operations Research 77: 226-239, 2017 (pdf, doi)Elsevier (Instances are HERE) Fuda Ma, Jin-Kao Hao, Yang Wang. IEEE Transactions on Evolutionary Computation 20(6): 908-923, 2016 (pdf, doi)IEEE CSP Xiangjing Lai and Jin-Kao Hao. (pdf, doi) Elsevier(Program Code is HERE, Readme is HERE) Zhipeng Lü and Jin-Kao Hao. (pdf) Springer Adrien Goëffon, Jean-Michel Richer and Jin-Kao Hao, A distance-based information preservation tree crossover for the maximum parsimony problem. Providence, Rhode Island, USA, December 4-5, 2014. 2003 - Nov. Knowledge-Based Systems 128: 78-92, 2017 (pdf, doi)Elsevier. Expert Systems with Applications 42(23): 9252-9263, 2015 (pdf, doi) Elsevier. (Informal Proceedings) Una Benlic and Jin-Kao Hao. Towards effective exact algorithms for the maximum balanced biclique problem in bipartite graphs. Meta-heuristiques et Intelligence Artificielle. 2008, Mexican COSNET scholarship, graduate of the Instituto Tecnologico Apizaco, co-supervisor B. CONTINUOUS RANDOM VARIABLES 5.1 Introduction 5.2 Expectation and Variance of Continuous Random Variables 5.3 The Uniform Random Variable 5.4 Normal Random Variables 5.5 Exponential Random Variables 5.6 Other Continuous Distributions 5.7 The Distribution of a Function of a Random Variable Summary Problems Theoretical Exercises Self-Test Problems and Exercises 6. Hypervolume-based multi-objective local search. Computers & Industrial Engineering 53(3): 542-558, 2007. on Evolutionary Computation (IEEE CEC-94), IEEE Press, pp450-455, June-July 1994. (pdf) Jin-Kao Hao, Jean-Jacques Chabrier. (Eds.). (pdf, doi) Elsevier Edmundo Bonilla Huerta, Béatrice Duval, Jin-Kao Hao, A Hybrid LDA and Genetic Algorithm for Gene Selection and Classification of Microarray Data. Solution-based tabu search for the maximum min-sum dispersion problem. Efficient Evaluation for Solving 0-1 Unconstrained Quadratic Optimization Problems. International Journal of Metaheuristics 1(1): 3-10, 2010. Engineering Applications of Artificial Intelligence 26(3): 1162-1173, 2013. (pdf, doi) Elsevier Una Benlic and Jin-Kao Hao. Panorama de l'Intelligence Artificielle - Ses bases méthodologiques et ses développements, sous la direction de Pierre Marquis, Odile Papini et Henri Prade. In Pierre Marquis, Odile Papini, Henri Prade (Eds). Chapter 26, pages 579-597, 2011. Draft (pdf) Wiley Oliver Bailleux and Jin-Kao Hao, Stochastic search algorithms (in French). (pdf) Springer Yang Wang, Zhipeng Lü, Jin-Kao Hao. (pdf) Springer Jean-Philippe Hamiez and Jin-Kao Hao, Solving the sports league scheduling problem with Tabu search. We are especially interested in metaheuristics and hybrid approaches combined with machine learning and data mining techniques. SIMULATION 10.1 Introduction 10.2 General Techniques for Simulating Continuous Random Variables 10.3 Simulating from Discrete Distributions 10.4 Variance Reduction Techniques Summary Problems Self-Test Problems and Exercises Answers to Selected Problems Solutions to Self-Test Problems and Exercises Index Common Discrete Distributions Common Continuous Distributions "Metaheuristics, Optimization and Learning" LERIA (Former Director) Faculty of Sciences - University of Angers 2, Boulevard Lavoisier, 49045 Angers Cedex 01 - France Email: Jin-Kao.Hao[at]univ-angers.fr Phone: (+33) 2 41 73 50 76, Fax: (+33) 2 41 73 50 73Metaheuristics & intelligent computing, learning-driven combinatorial optimization, constraint solving and constrained optimization, data mining and artificial intelligence, and applications (timetabling, resource planning, transportation, mobile networks, bioinformatics).Our work is about search algorithms and methods for solving large-scale complex combinatorial problems. Information Sciences 502: 91-108, 2019. Cowling (Eds.): EvoCOP 2009, Lecture Notes in Computer Science 5482: 1–12. Adaptive neighborhood search for nurse rostering. 2021 (pdf, doi) Elsevier.Sun Wen, Jin-Kao Hao, Yuhao Zang, Xiangjing Lai. Solving bi-objective flow shop problem with hybrid path relinking algorithm. Iterated Local Search for Biclustering of Microarray Data. (pdf) Springer Frédéric Lardeux, Frédéric Saubion and Jin-Kao Hao, Recombination operators for satisfiability problems. LIMIT THEOREMS 394 8.1 Introduction 8.2 Chebyshev's Inequality and the Weak Law of Large Numbers 8.3 The Central Limit Theorem 8.4 The Strong Law of Large Numbers 8.5 Other Inequalities and a Poisson Limit Result 8.6 Bounding the Error Probability When Approximating a Sum of Independent Bernoulli Random Variables by a Poisson Random Variable 8.7 The Lorenz Curve Summary Problems Theoretical Exercises Self-Test Problems and Exercises 9. An iterated "hyperplane exploration" approach for the Quadratic Knapsack Problem. Journal of Heuristics 17(2): 97-118, 2011. Jin-Kao Hao, Rapid prototyping in Prolog. (pdf, doi)IEEE CSP.Yinuo Li, Jin-Kao Hao. (pdf) Una Benlic, Jin-Kao Hao. Ahmad (Eds.): PRIB 2012, Lecture Notes in Computer Science 7632: 2012.(pdf) Springer Daniel Porumbel, Jin-Kao Hao, Pascale Kuntz. Artificial Intelligence and Mathematics V, Electronic Proceeding amai/Proceedings.html, January 1998. 11eme Congres on Reconnaissance des Formes et Intelligence Artificielle (RFIA-98), Vol. (pdf), Inderscience Publishers Zhipeng Lü, Fred Glover, Jin-Kao Hao. Lecture Notes in Computer Science 5253: 262-273, Springer, 2008, Draft (pdf) Springer Benoît Laurent and Jin-Kao Hao, Simultaneous vehicle and crew scheduling for extra urban transports. C. Herrera, M. Algorithms for the minimum sum coloring problem: a review. Forrest, G. Technical Gazette 22(1):11-24, 2015 (pdf, doi) Xiujun Zhang, Juan Zhao, Jin-Kao Hao, Xing-Ming Zhao, Lunan Chen. Ph.D thesis, Université de Franch-Comté (defended at the Université de Bourgogne), February 1991. In I. Software is available HERE. A Tabu Search Algorithm with Direct Representation for Strip Packing. 1995, IEEE Press. (pdf, doi) Elsevier Zhipeng Lü and Jin-Kao Hao. PUSH: a generalized operator for the maximum weight clique problem. AXIOMS OF PROBABILITY 2.1 Introduction 2.2 Sample Space and Events 2.3 Axioms of Probability 2.4 Some Simple Propositions 2.5 Sample Spaces Having Equally Likely Outcomes 2.6 Probability as a Continuous Set Function 2.7 Probability as a Measure of Belief Summary Problems Theoretical Exercises Self-Test Problems and Exercises 3. A hybrid metaheuristic for multiobjective unconstrained binary quadratic programming. (Eds.): LION 2015, Lecture Notes in Computer Science 8994: 1–7, 2015. (pdf) Springer José Crispin Hernandez Hernandez, Béatrice Duval and Jin-Kao Hao. 2020, co-supervised by Dr. Olivier Goudet)Pengfei He (CSC scholarship, graduate of Nanjing Agricultural University, School of Management Science & Engineering, PhD starting Oct 2019, PhD defence planned for 2022) Yuji Zou (CSC scholarship, graduate of Chongqing University, School of Mechanical Engineering,PhD starting Oct 2021) Visiting Ph.D. candidates Wassim Ayadi (Assistant Professor at University of Tunis El Manar, Tunisia, PhD study Oct 2008 - Dec. Artificial Intelligence and Mathematics VI, Fort Lauderdale, Florida, January 2000. Habilitation thesis (Professorship Diploma), Univerisity of Montpellier II, January 1998. Neural Computing and Applications 21(8): 1917-1929, 2012, Draft (pdf,doi) Springer Xiujun Zhang, Xing-Ming Zhao, Kun He, Le Lu, Yongwei Cao, Jingdong Liu, Jin-Kao Hao, Zhi-Ping Liu, Luonan Chen. (pdf) Springer Giglia Gomez Villouta, Jean-Philippe Hamiez, Jin-Kao Hao.Tabu Search with Consistent Neighbourhood for Strip Packing. of IEEE Intl. Voss, S. 1997, Lecture Notes in Computer Science 1363, ISBN 3-540-64169-6, Springer-Verlag, 349 pages, February 1998. Abraham (Eds.) Handbook of Optimization. Swap-vertex based neighborhood for the broadly defined Steiner tree problems. A solution-driven multilevel approach for graph coloring. (Program Code is HERE).Zequn Wei, Jin-Kao Hao, A threshold search based memetic algorithm for the disjunctively constrained knapsack problem. Using Solution Properties within an Enumerative Search to Solve a Sports League Scheduling Problem. (pdf) Springer Michel Vasquez and Jin-Kao Hao, Une approche hybride pour le problème de sac-à-dos multidimensionnel. (pdf) Springer Jin-Kao Hao and Raphaël Dorne, A new population-based method for satisfiability problems. Duval and D. Applied Soft Computing 65: 542-553, 2018 (pdf, doi) Elsevier. Parallel iterative solution-based tabu search for the obnoxious p-median problem. CP-97, Lecture Notes in Computer Science 1330: 196-208, Springer-Verlag, Nov., 1997. Qinghua Wu, Qing Zhou, Yan Jin, Jin-Kao Hao. Moscato (Eds.) Handbook of Memetic Algorithms. Purshouse, P. Effective learning-based hybrid search for bandwidth coloring. Morgan Kaufmann Publishers. A study of recombination operators for the Cyclic Bandwidth Problem. European Journal of Operational Research 253(1): 25-39, 2016 (pdf, doi) Elsevier. A Memetic Algorithm for Graph Coloring. European Journal of Operational Research203(1): 241-250, 2010. Engineering Applications of Artificial Intelligence 97: 104018, Jan. A practical case of the multiobjective knapsack problem: Design, modelling, tests and analysis. European Journal of Operational Research 269(3): 834-843, 2018(pdf, doi) Elsevier Wenyu Wang, Jin-Kao Hao, Qinghua Wu. Tabu search with feasible and infeasible searches for equitable coloring. Accepted to IEEE Transactions on Cybernetics (pdf, doi)IEEE SMC. Selected and revised paper from AE 2015, Lecture Notes in Computer Science 2016 (to appear). Iterated two-phase local search for the colored traveling salesmen problem. A fusion condition for community detection with modularity. Discrete Applied Mathematics 143: 252-265, 2004. Hybrid search with neighborhood reduction for the multiple traveling salesman problem. Communications in Computer and Information Science (CCIS) 13: 599-598, Springer, 2008 (pdf) Springer Zhipeng Lü and Jin-Kao Hao. IEEE/ACM Transactions on Computational Biology and Bioinformatics 5(1): 136-145, 2008. A genetic algorithm for scaled-based translocon simulation. He was the Director of the LERIA Laboratory (2003-2015) (Angers Computer Science Lab) and the founder of the research group "Metaheuristics, Optimization and Applications". A dedicated genetic algorithm for two-dimensional non-guillotine strip packing. CONDITIONAL PROBABILITY AND INDEPENDENCE 3.1 Introduction 3.2 Conditional Probabilities 3.3 Bayes's Formula 3.4 Independent Events 3.5 P(·|F) Is a Probability Summary Problems Theoretical Exercises Self-Test Problems and Exercises 4. Hypervolume-Based Multi-Objective Path Relinking Algorithm. Elloumi, A.Y. Zomaya (Eds.) Algorithms in Computational Molecular Biology - Techniques, Approaches and Applications. (pdf, doi) Elsevier Daniel Cosmin Porumbel, Jin-Kao Hao, Pascale Kuntz. Elloumi, A.Y. Zomaya (Eds.) Biological Knowledge Discovery Handbook: Preprocessing, Mining and Postprocessing of Biological Data. Chapter 24, 2012. Chapter 20, pages 505-528, 2013. Draft (pdf) Springer. (pdf) Elsevier Valérie Guihaire and Jin-Kao Hao. A memetic algorithm for discovering negative correlation biclusters of DNA microarray data. Neurocomputing 145: 12-22, 2014 (pdf, doi) Elsevier. Memetic Algorithms in Discrete Optimization. Multi-neighborhood simulated annealing for personalized user project planning. Snasel, A. (Eds): EMO 2015, Lecture Notes in Computer Science 9018: 171-186, 2015. (pdf) Springer. Discrete Applied Mathematics 156(10): 1683-1693, 2008. Jin-Kao Hao, François Trousset, Jean-Jacques Chabrier, Prototyping an Inconsistency Checking Tool for Software Process Models. 2011 - May 2015, co-supervisor JP Hamiez) Frederic Lardeux (Associate Professor at University of Angers, co-supervisor F. (pdf) Mériéma Bélaidouni and Jin-Kao Hao, Analysis of the configuration space of the maximal constraint satisfaction problem. (pdf) Springer Cyril Grelier, Olivier Goudet, Jin-Kao Hao. Evolutionary Computation 14(2): 223-253, 2006. Stagnation-aware breakout tabu search for the Minimum Conductance Graph Partitioning Problem. Journal of Heuristics 4(1): 47-62, 1998. Diversity Control and Multi-Parent Recombination for Evolutionary Graph Coloring Algorithms. (pdf) Elsevier Benoit Laurent and Jin-Kao Hao. A study of adaptive diversification strategy for iterated local search. of Metaheuristics, Intl. Engineering Applications of Artificial Intelligence 71: 1-14, 2018 (pdf, doi) Elsevier. Xiangjing Lai, Dong Yue, Jin-Kao Hao, Fred Glover. Adelaide Freitas, Wassim Ayadi, Mourad Elloumi, Jose Luis Oliveira, Jin-Kao Hao. JOINTLY DISTRIBUTED RANDOM VARIABLES 6.1 Joint Distribution Functions 6.2 Independent Random Variables 6.3 Sums of Independent Random Variables 6.4 Conditional Distributions: Discrete Case 6.5 Conditional Distributions: Continuous Case 6.6 Order Statistics 6.7 Joint Probability Distribution of Functions of Random Variables 6.8 Exchangeable Random Variables Summary Problems Theoretical Exercises Self-Test Problems and Exercises 7. Qinghua Wu and Jin-Kao Hao. Solving the course timetabling problem with a hybrid heuristic algorithm. (pdf) Springer. Jean-Philippe Hamiez, Julien Robet, Jin-Kao Hao. (pdf, doi) World Scientific Daniel Cosmin Porumbel, Jin-Kao Hao, Pascale Kuntz. Studies in Computational Intelligence 379, Chapter 6, pages 73-94, 2012. AE-1995 Lecture Notes in Computer Science 1063: 333-344, Sept. 2000. A Memetic Algorithm for Gene Selection and Molecular Classification of Cancer. Computers & Operations Research 102: 141-149, 2019 (pdf, doi)Elsevier Wen Sun, Jin-Kao Hao, Alexandre Caminada. Computers & Operations Research 81: 78-89, 2017 (pdf, doi)Elsevier Fuda Ma and Jin-Kao Hao. GECCO-2017 Companon, pages 121-122, July 15-19, 2017. Information Sciences572: 182-199, 2021(pdf, doi) Elsevier. (Program Code is HERE or HERE).Yan Jin, Bowen Xiong, Kun He, Jin-Kao Hao, Chu-Min Li, Zhang-Hua Fu. Clustering driveniterated hybrid search for vertex bisection minimization. Accepted to IEEE Transactions on Computers, Oct. (Program Code is HERE) Yuning Chen, Jin-Kao Hao, Fred Glover. (pdf) Springer Jin-Kao Hao, Philippe Galinier and Michel Habib, Metaheuristiques pour l'optimisation combinatoire et l'affectation sous contraintes. 2013 - May 2017, co-supervisor Dr. A. (pdf) Springer Hakim Mabed, Alexandre Caminada, Jin-Kao Hao and Denis Renaud, A dynamic traffic model for frequency assignment.PPSN-02, Lecture Notes in Computer Science 2439: 779-788, Springer-Verlag, 2002. COMBINATORIAL ANALYSIS 1.1 Introduction 1.2 The Basic Principle of Counting 1.3 Permutations 1.4 Combinations 1.5 Multinomial Coefficients 1.6 The Number of Integer Solutions of Equations Summary Problems Theoretical Exercises Self-Test Problems and Exercises 2. Pizzuti, M.D. Ritchie, and M. A hybrid evolutionary algorithm for the Clique Partitioning Problem. Giacobini (Eds.): EvoBIO 2010, Lecture Notes in Computer Science 6023: 134-145, 2010. Pizzuti, M.D. Ritchie, M. PPSN-06, Lecture Notes in Computer Science 4193: 761-770, Springer-Verlag, 2006. Philippe Galinier and Jin-Kao Hao, A general approach for constraint solving by local search. Yan Jin and Jin-Kao Hao. (pdf)ACM Press. Computers & Operations Research40(1): 192-206, 2013. Jin-Kao Hao and Jérôme Pannier, Simulated annealing and tabu search for constraint solving. Hybrid evolutionary search for the minimum sum coloring problem of graphs. Memetic search for the max-bisection problem. (pdf) Springer Jean-Philippe Hamiez and Jin-Kao Hao, Scatter search for graph coloring. His work with his co-authors has been recognized by several awards (12th DIMACS Implementation Challenge on Vehicle Routing - SDVRP Track in 2022, Engineering Applications of AI Best Paper Award 2017, 11th DIMACS Implementation Challenge on Steiner Tree Problems in 2014, Bronze Medal at the Nurse Rostering Competition 2010, Silver Medal at the PATAT-WATT 2007 International Timetabling Competition, EvoCOP 2009, MICAI 2006, PPSN 1996 best paper awards or nominees) and received multiple citations. Beldiceanu, N. 2013 - July 2016) Olivier Gach (Lecturer at IUT Le Mans, co-supervisor Pr. Dominique Py, PhD Oct. Zhen Shang, Songzheng Zhao, Jin-Kao Hao, Xue Yang, Fuda Ma. Multiple phase tabu search for bipartite boolean quadratic programming with partitioned variables. Identifying dysregulated pathways in cancers from pathway interaction networks. Torres-Jimenez) Ines Sghir (Assistant at University of Tunis, co-Director supervised by K. (pdf, doi) Springer. (Program Code is available HERE)Jintong Ren, Jin-Kao Hao, Eduardo Rodriguez-Tello. 1994. Schaerfer et al. (pdf, doi), IGI Global. Applied Soft Computing 104: 107174, June 2021 (pdf, doi) Elsevier. Yinuo Li, Jin-Kao Hao, Brahim Chabane. User project planning in social and medico-social sector: models and solution methods. 2012) Edmondo Bonilla Huerta (Associate Professor at the Instituto Tecnologico Apizaco, Tlaxcala, Mexico, PhD study Nov. Arnaud Liefooghe, Sébastien Verel, Luis Paquete, Jin-Kao Hao. He graduated in 1982 from the National University of Defense Technology (School of Computer Science) (China). (pdf, doi) World Scientific Una Benlic and Jin-Kao Hao. Yangming Zhou, Jin-Kao Hao, Béatrice Duval. Computers & Industrial Engineering 59(1): 16-23, 2010. Lecture Notes in Artificial Intelligence: 4293: 392-403, Springer-Verlag, 2006 (5th Mexican International Conference on Artificial Intelligence, Best paper award, 3rd price), (pdf) Springer Jean-Philippe Hamiez and Jin-Kao Hao, Sports league scheduling: enumerative search for Prob026 from CSPLib. An effective two-stage simulated annealing algorithm for the Minimum Linear Arrangement problem. Frequency-driven tabu search for the maximum s-plex problem. In F. Hermes 2014. (pdf). Frédéric Lardeux, Frédéric Saubion and Jin-Kao Hao, Three truth values for SAT and MAX-SAT problems. (pdf) Philippe Galinier, Jin-Kao Hao, Solving the progressive party problem by local search. Meta-heuristics: Advances and Trends in Local Search Paradigms for Optimization, Chapter 29, pp418-432, S. (pdf) IEEE Press. He is on the Editorial Board of several International Journals and participated in the organization of a number of Conferences and Workshops in addition to co-editing 9 volumes of Springer LNCS series. (pdf) Springer Una Benlic and Jin-Kao Hao. In EG Talbi (Ed.) Hybrid Metaheuristics. (pdf, doi) Elsevier (Extended version of PRIB'08 paper) Béatrice Duval and Jin-Kao Hao. Revue d'Intelligence Artificielle 13(2): 283-324, 1999. (pdf) Hermes. Béatrice Duval, Jin-Kao Hao, José Crispin Hernandez Hernandez. Goeffon)Zequn Wei (Assistant Professor at Beijing University of Posts and Telecommunications, School of Management, CSC scholarship, graduate of Northwestern Polytechnical University, School of Automation, Xi'an, PhD study April 2018 - March 2021) Post-doc and visiting PhD students Zhanghua Fu (2012-2015, PhD from Huazhong University of Science and Technology, China, now at the Chinese University of Hong Kong, Shen Zhen Campus, China since September 2015) Xiangjing Lai (2013-2015, PhD from Huazhong University of Science and Technology, Research Professor at Nanjing University of Posts and Telecommunications, China since 2016) Zhipeng Lü (2007-2011, PhD from Huazhong University of Science and Technology, Full Professor at HUST, China since March 2011) Manuel Clergue (2000-2001, PhD from University of Nice, Associate Professor at Universite des Antilles et de la Guyane, France) Yufeng Hao (2004-2005, PhD from Southeast University, China, funded by the Franco-Chinese Foundation, R&D Director, Chief Scientist, Beijing Haitian Ruisheng Science Technology Ltd, China) Jian Zhou (2003-2004, Ph.D from Tsinghua University, China, funded by the French Research Ministry, Full Professor at Shanghai University, School of Management)Qing Zhou (2019-2020, PhD from Huazhong University of Science and Technology, Associate Professor at Northeastern University, School of Management). Drawing Euler diagrams from region connection calculus specifications with local search. of 2001 Genetic and Evolutionary Computation Conference (GECCO-01), pages 1382-1388, San Francisco, California, July 2001. Torres-Jimenez, A comparison of memetic recombination operators for the MinLA problem. MICAI-05, Lecture Notes in Computer Science 3789: 613-622, Springer, 2005. of 19th ACM Computer Science Conference (ACM CSC-91), San Antonio, ACM Press, pp203-210, March 1991. Conf. An iterated three-phase search approach for solving the Cyclic Bandwidth Problem. Ghedira, PhD defence in April 2016) Wen Sun (Assistant Professor at Southeast University, School of Cyber Science and Engineering, CSC scholarship, graduate of Northwestern Polytechnical University, Xi'an, PhD study April 2015-Nov. Typical examples of such applications include resource assignment, planning, scheduling and re-scheduling, timetabling, routing... Duval) Marc-Olivier Buob (Research Scientist at Nokia Bell Labs, PhD defense in November 2008, France Telecom R&D research scholarship, graduate of the Ecole Nationale Superieure d'Informatique pour l'Industrie et l'Entreprise (ENSIIE), Paris, co-supervisor J.L. Lutton, France Telecom R&D) Brahim Chabane (R&D Engineer, PhD Nov. Diversification-Driven Tabu Search for Unconstrained Binary Quadratic Problems. 5system demonstration paper) (pdf) Springer. General swap-based multiple neighborhood tabu search for the maximum independent set problem. Engineering Applications of Artificial Intelligence 37: 20-33, 2015 (pdf, doi) Elsevier. François Schwarzentruber and Jin-Kao Hao. IEEE Transactions on Evolutionary Computation 23(6): 1015-1028, February 2019. BMC Bioinformatics 13: 126, 2012. A distributed hybrid algorithm for the graph coloring problem. Engineering Applications of Artificial Intelligence 77: 86-97, 2019 (pdf, doi) Elsevier. A Memetic Approach for the Max-Cut Problem. 1998) from the University of Science and Technology of Montpellier (France). Yuning Chen and Jin-Kao Hao. Engineering Applications of Artificial Intelligence 56:102-120, 2016 (pdf, doi) Elsevier(Program Code is HERE) (The code of the presented IMS algorithm is integrated in the R package socialroulette for social grpupings). Yangming Zhou, Jin-Kao Hao, Béatrice Duval. Transit Network Timetabling and Vehicle Assignment for Regulating Authorities. (pdf) Springer Vincent Barichard and Jin-Kao Hao, A population and interval constraint propagation algorithm. Jussien, E. Metaheuristic algorithms. Informed reactive tabu search for graph coloring.Asia-Pacific Journal of Operational Research30(4): 1350010 2013. (pdf, doi) Elsevier Frédéric Lardeux, Frédéric Saubion and Jin-Kao Hao, GASAT: a genetic local search algorithm for the satisfibility problem. In 2015, he was nominated as Senior Fellow of the Institut Universitaire de France. INFORMS Journal on Computing 27(2): 221-237, 2015 (pdf, doi) (online supplement) Informs. A partial evaluator and its application to constraint logic programming. 2021 (pdf, doi) Elsevier(Program Code is HERE)Jian Chang, Lifang Wang, Jin-Kao Hao, Yang Wang. Path relinking for the fixed spectrum frequency assignment problem. Expert Systems with Applications 42(10): 4755-4767, 2015 (pdf, doi) Elsevier. of 3rd Intl. His work includes some 300 peer-reviewed publications in international journals, book chapters and conference proceedings in the fields of Metaheuristics, Evolutionary Computation, Combinatorial Optimization, Bioinformatics, Constraint Programming and Artificial Intelligence. (pdf) Raphaël Dorne and Jin-Kao Hao, A new genetic local search algorithm for graph coloring. Computers & Operations Research 38(7): 1066-1075, 2011. 2009. Elloumi) Vincent Barichard (Associate Professor at the University of Angers, PhD study in Oct 2000 - Nov. Knowledge-Based Systems 97: 89-100, 2016 (pdf, doi)Elsevier. EvoWorkshops 2006, Lecture Notes in Computer Science 3907: 34-44, Springer, 2006. Michel Vasquez and Jin-Kao Hao, Upper bounds for the SPOT 5 daily photograph scheduling problem. (pdf) Springer Eduardo Rodriguez-Tello, Jin-Kao Hao and Jose Torres-Jimenez, Memetic algorithms for the MinLA problem. Computing maximum k-defective cliques in massive graphs. (pdf, doi) Oxford Journals Zhipeng Lü and Jin-Kao Hao. Metaheuristics International Conference (MIC-2009), extended version, 2012 (pdf). (pdf, doi)IEEE CSP. Ali (Eds.): IEA/AIE 2010, Lecture Notes in Artificial Intelligence 2096: 21-30, 2010. (pdf) Springer Giglia Gomez Villouta, Jean-Philippe Hamiez, Jin-Kao Hao. Zhanghua Fu and Jin-Kao Hao. of the 23th Intl. International Journal of Mobile Network Design and Innovation, (1)1:24-33, 2005. Journal of Heuristics25(4-5): 565-590, 2019. Shibuya, H. (Eds.): PPSN 2010, Lecture Notes in Computer Science 6238: 556-565, 2010. A counting technique based on SVM-RFE for selection and classification of microarray data. European Journal of Operational Research 274(1): 35-48, 2019 (pdf, doi) Elsevier. In Abraham P. (pdf, doi) Elsevier Qinghua Wu and Jin-Kao Hao. An effective heuristic algorithm for sum coloring of graphs. 2013 - Dec 2017, Industrial research grant CIFRE, co-supervisor Dr. M. Basseur) Alain Chabrier (Senior Technical Staff Member (STSM) for Decision Optimization, IBM, PhD defense in 2003, graduate of the Ecole Polytechnique, Paris) Yuning Chen (Associate Professor at the National University of Defense Technology, Changsha, China, CSC scholarship, graduate of NUDT,PhD study Oct. AE-00, Lecture Notes in Computer Science 1829: 244-255, Springer-Verlag, 2000. (pdf), Inderscience Publishers Wassim Ayadi, Mourad Elloumi, Jin-Kao Hao. A Biclustering Algorithm based on a Bicluster Enumeration Tree: Application to DNA Microarray Data. Experiments on Local Search for bi-objective unconstrained binary quadratic programming.In A. (pdf) Springer Eduardo Rodriguez-Tello, Jin-Kao Hao and J. A tabu based memetic algorithm for the max-mean dispersion problem. (Eds): Selected and revised paper from AE 2013, Lecture Notes in Computer Science 8752: 145-156, 2014. European Journal of Operational Research 273(2): 464-487, 2019(pdf, doi) Elsevier. Computers & Operations Research127: 105155, March 2021 (pdf, doi)Elsevier (Program Code is HERE)Xiaoyu Chen, Yi Zhou, Jin-Kao Hao, Mingyu Xiao. of Mobile Network Design & Innovation, Knowledge-based Systems, Knowledge and Information Systems, Mathematical Programming Computation, Natural Computing and Applications, Neurocomputing, PeerJ Computer Science, RAIRO Operations Research, Transportation Research, IEEE/ACM Transactions on Computational Biology and Bioinformatics, BioData Mining, Bioinformatics, BMC Bioinformatics, Briefings in Bioinformatics, Genomics Proteomics & Bioinformatics, Nucleic Acids Research). Finke (Ed.) Recherche Operationnelle et Reseaux, traité IGAT, Chapitre 7, pp196-240, Hermes, 2002. The Case for Strategic Oscillation. Annals of Operations Research 183(1): 163-173, 2011. 1990, IEEE CS Press. (pdf) Jin-Kao Hao, Jean-Jacques Chabrier, An Interval calculus based Finite Domain Constraint Solver and its implementation in Prolog. Arnaud Liefooghe, Sébastien Verel, Jin-Kao Hao. Jintong Ren, Jin-Kao Hao, Eduardo Rodriguez-Tello. Memetic search for identifying critical nodes in sparse graphs. 3(4): 379-397, 1999. Iterated maxima search for the maximally diverse grouping problem. Operations Research Proceedings 2005: 703-708, Springer-Verlag, 2006. of Applied Metaheuristic Computing, Intl. (Eds.) Revised selected papers, 14th International Conference on Artificial Evolution (EA 2019), France, October 29-30, 2019, Lecture Notes in Computer Science 12052: 177-191, 2020. Dual probability learning based local search for the task assignment problem. IEEE Transactions on Automation Science and Engineering 19(1): 332-347, 2022 (pdf, doi)IEEE RAS.Yi Zhou, Weibo Lin, Jin-Kao Hao, Mingyu Xiao, Yan Jin. Variable population memetic search: A case study on the critical node problem. Oliver Gach and Jin-Kao Hao. Knowledge Guided Tabu Search for the Prize Collecting Steiner Tree Problem in Graphs. Expert Systems with Applications 64:412-422, 2016 (pdf, doi) Elsevier. A Local Search Approach for Transmembrane Segment and Signal Peptide Discrimination. In C. (pdf, doi) Springer(Program Code is HERE) Qinghua Wu and Jin-Kao Hao. Pavone (Eds.): PPSN 2012, Lecture Notes in Computer Science 7492: 297-306, 2012. PPSN-98, Lecture Notes in Computer Science 1498: 745-754, Springer-Verlag, Sept. (pdf) Springer Zhipeng Lü and Jin-Kao Hao. A Critical Element-Guided Perturbation Strategy for Iterated Local Search. of Mathematics in Operational Research, J. Fleming and C. Proceedings of the 22nd European Conference on Evolutionary Computation in Combinatorial Optimization (EvoCOP 2022), 20-22 April, 2022, Lecture Notes in Computer Science 13222: 1-16. (pdf, doi) Elsevier Benoit Laurent and Jin-Kao Hao. Information Sciences 436-437: 282-301, 2018 (pdf, doi)Elsevier. PROPERTIES OF EXPECTATION 7.1 Introduction 7.2 Expectation of Sums of Random Variables 7.3 Moments of the Number of Events that Occur 7.4 Covariance, Variance of Sums, and Correlations 7.5 Conditional Expectation 7.6 Conditional Expectation and Prediction 7.7 Moment Generating Functions 7.8 Additional Properties of Normal Random Variables 7.9 General Definition of Expectation Summary Problems Theoretical Exercises Self-Test Problems and Exercises 8. Simultaneous vehicle and driver scheduling: a case study in a limousine rental company. (Program Code is HERE) Brahim Chabane, Matthieu Basseur, Jin-Kao Hao. IEEE Transactions on Cybernetics 49(10): 3699-3712 2019 (pdf, doi)IEEE SMC. IEEE Transactions on Evolutionary Computation 21(5): 731-745, 2017 (pdf, doi)IEEE CSP. Tessier) Benoit Laurent (R&D team leader

at PERINFO SA, PhD defense in December 2008, Industrial research grant CIFRE with PERINFO SA, scholarship,graduate of the University of Angers)Yinuo Li (Industrial research grant CIFRE, graduate of Polytech'Nantes and Ocean University of China, School of Computer Science, PhD starting in March 2019, PhD defence November 2021) Zhi Lu (Assistant Professor at Shanghai University for Science and Technology, School of Management, PhD Oct. Stuetzle (Ed.), selected papers from Learning and Intelligent OptimizatioN (LION III), Lecture Notes in Computer Science 5851: 148-162, 2009. (pdf) Springer Daniel Cosmin Porumbel, Jin-Kao Hao, Pascale Kuntz. on on Software Engineering and Knowledge Engineering (SEKE-92), pages 227-234, June, 15-20 1992, Capri, Italy. European Journal of Operational Research April 2022 (pdf, doi) Elsevier. (Program Code is HERE).Yongliang Lu, Jin-Kao Hao, Qinghua Wu. Solving the Clustered Traveling Salesman Problem via TSP methods. Accepted to IEEE Transactions on Evolutionary Computation March 2022. Yang Wang,Zhipeng Lü, Fred Glover, Jin-Kao Hao. Draft (pdf), Inderscience Publishers Fred Glover and Jin-Kao Hao. Kashima, J. (pdf) Raphaël Dorne and Jin-Kao Hao, An evolutionary approach for frequency assignment in cellular radio networks. Combined neighborhood tabu search for community detection in complex networks. In G. 4OR -A Quarterly Journal of Operations Research 8(3): 239-253, 2010. Draft (pdf, doi) Springer Jean-Philippe Hamiez, Jin-Kao Hao, Fred Glover. A study of tabu search for coloring random 3-colorable graphs around phase transition. International Journal of Applied Metaheuristic Computing 1(4): 1-24, 2010. Zequn Wei and Jin-Kao Hao. Two-stage solution-based tabu search for the multidemand multidimensional knapsack problem. RFIA 2000, Paris, Jan. Conditional mutual inclusive information enables accurate quantification of associations in gene regulatory networks. Nucleic Acids Research 43(5):e31, 2015 (pdf, doi) Oxford Journals. Basseur) Yangming Zhou (Assistant Professor at Shanghai Jiao Tong University, Sino-US Global Logistics Institute, CSC scholarship,graduate of Zhejiang University and Donghua University, PhD study Nov. Dijkstra et al. Journal of Heuristics 26: 711-741, 2020(pdf, doi) Springer. He is involved in several international collaboration programs, in particular with China, Canada, Mexico, Tunisia and USA.He has served as an Invited Member of more than 200 Program Committees of some 30 International and National Conferences and serves regularly as a reviewer for some 35 well-established Journals in his research domain. (pdf, doi) Elsevier Qinghua Wu and Jin-Kao Hao. Springer-Verlag, 2005. A multi-agent based optimization method applied to the quadratic assignment problem. In T. A study of crossover operators for gene selection of microarray data. R2-IBMOLS applied to a practical case of the multiobjective knapsack problem. Dublin, Ireland. (pdf) Springer Vincent Barichard, Hervé Deleau, Jin-Kao Hao, Frédéric Saubion, A hybrid evolutionary algorithm for constraint satisfaction problems. (Program Code is HERE, Test Graphs are HERE) Yuning Chen and Jin-Kao Hao. (pdf) Springer Vincent Barichard and Jin-Kao Hao, Genetic tabu search for the multi-objective knapsack problem. RAIRO Operational Research 50(2): 269-293, 2016 (pdf,doi) EDP Sciences Xiangjing Lai, Jin-Kao Hao, Fred Glover. Legrand et al (Eds): Selected and revised paper from AE 2013, Lecture Notes in Computer Science 8752: 157-168, 2014. (pdf, doi) Elsevier. Draft (pdf, doi)Elsevier Wassim Ayadi, Mourad Elloumi, Jin-Kao Hao. BicFinder: A Biclustering Algorithm for Microarray Data Analysis. Knowledge and Information Systems: An International Journal 30(2): 341-358, 2012 (pdf, doi) Springer Wassim Ayadi, Mourad Elloumi, Jin-Kao Hao. (pdf, doi) BioMed Central Rongqiang Zeng, Matthieu Basseur, Jin-Kao Hao. (postscript) (pdf). Alexandre Caminada, Jin-Kao Hao, Jean-Luc Lutton, Vincent Martin, Réseaux de télécommunications. Transit network re-timetabling and vehicle scheduling? PPSN-04, Lecture Notes in Computer Science 3242: 650-659, Springer-Verlag, 2004. Target applications concern those highly combinatorial and strongly constrained problems which cannot be solved other ways. Polynomial unconstrained binary optimisation - Part 1. International Journal of Metaheuristics 1(3):232-256, 2011. (Short paper)(pdf) Springer. f-flip Strategies for unconstrained binary quadratic programming. Knowledge-Based Systems 167: 68-86, 2019 (pdf, doi)Elsevier. Studies in Computational Intelligence 434, Chapter 6, pages 157-184,2013. 1990. Iterated responsive threshold search for the quadratic multiple knapsack problem. Annals of Operations Research 226(1): 101-131, 2015 (pdf, doi) Springer(Program Code will be HERE). Pinson (Eds.): CPAIOR 2012, Lecture Notes in Computer Science 7298: 395-408, 2012. (pdf) EDP Sciences Philippe Galinier and Jin-Kao Hao, Hybrid evolutionary algorithms for graph coloring. Proc. He served as Program co-chair or General chair for several international Conferences (in particular, IEEE BIBM 2014, Area Chair for ICTAI 2014 2013, 2011, 2010, PRIB 2013, EvoCOP 2012, EvoCOP 2011, AE 2011, 1997, EMO 2009). A Hybrid Metaheuristic Approach to Solving the UBQP Problem. Complex Networks: Advances in Research and Applications, Chapter 4, pages 103-135, Nova Science Publishers, Inc., 2017. Giacobini, M.D. Ritchie, C. Identifying cancer-related microRNAs based on gene expression data. Sese, S. Mathematical Programming Computation 9(2): 297-320, 2017 (pdf, doi)Springer (Program Codes are HERE and HERE) Yi Zhou and Jin-Kao Hao. Jourdan et al. (pdf)ACM Press Jean-Michel Richer, Adrien Goëffon, Jin-Kao Hao. (Program Code is HERE) Zhanghua Fu and Jin-Kao Hao. Merz, J.K. Hao. Reinforcement learning based local search for grouping problems: A case study on graph coloring. Information Sciences570: 689-707, 2021.(pdf, doi) Elsevier. (Program Code is HERE).Qing Zhou, Jin-Kao Hao, Qinghua Wu. Responsive threshold search based memetic algorithm for balanced minimum sum-of-squares clustering. Neurocomputing 73(13-15): 2375-2383, 2010. Iterated two-phase local search for the Set-Union Knapsack Problem. (Program Code is HERE) Xiangjing Lai, Jin-Kao Hao, Dong Yue. IEEE Transactions on Evolutionary Computation 25(1): 187-200, 2021. Discrete Applied Mathematics 160(16-17): 2397-2407, 2012. Expert Systems with Applications 161: 113593, December 2020 (pdf, doi) Elsevier.Xiangjing Lai, Jin-Kao Hao, Zhang-Hua Fu, Dong Yue. Transit network design and scheduling: a global review. A Memetic Algorithm for Phylogenetic Reconstruction with Maximum Parsimony. Prof of 5th Rocky Mountain Conference on Artificial Intelligence (RMCAI-90), At Las Cruces New Mexico USA, Volume: Pragmatics in Artificial Intelligence pp 326- 331. of Intl. European Journal of Operational Research232(1): 209-220, 2014(pdf, doi) Elsevier(Program Code is HERE) Gary Kochenberger, Jin-Kao Hao, Fred Glover, Mark Lewis, Zhipeng Lü, Haibo Wang, Yang Wang. An iterated local search algorithm for the minimum differential dispersion problem. Computers & Operations Research40(1): 166-179, 2013. (pdf) Jin-Kao Hao and Raphaël Dorne, Study of genetic search for the frequency assignment problem. Applied Soft Computing 119: 108566, April2022 (doi) Elsevier.Mingjie Li, Jin-Kao Hao, Qinghua Wu. Learning-driven feasible and infeasible Tabu Search for airport gate assignment. Accepted to European Journal of Operational Research Dec. (pdf) Springer Mériéma Bélaidouni and Jin-Kao Hao, A measure of combinational landscape difficulty for the Metropolis algorithm. NARROMI: a noise and redundancy reduction technique improves accuracy of gene regulatory network inference. Lecture Notes in Computer Science 3612: 678-683. Expert Systems with Applications 71:457-468, 2017 (pdf, doi) Elsevier Yuning Chen and Jin-Kao Hao. Improving the Louvain algorithm for community detection with modularity maximization. Iterated variable neighborhood search for the capacitated clustering problem. Bioinformatics 31(8):1226-34, 2015. (Program Code is HERE).Zequn Wei, Jin-Kao Hao, Multistart solution-based tabu search for the Set-Union Knapsack Problem. Proceedings of GECCO-2017, pages 369-376, July 15-19, 2017. (Program code and instances are here) Yang Wang, Jin-Kao Hao, Fred Glover, Zhipeng Lü, Qinghua Wu. Solving the maximum vertex weight clique problem via binary quadratic programming.Journal of Combinatorial Optimization32(2): 531-549, 2016 (pdf, doi)Springer. Neri, C. Before joining the University of Angers, he has been an Associate Professor at the National Higher Engineering School "Ecole des Mines d'Ales" (Nimes Campus) and head of the "Constraints and Heuristics" research group until September 1999. His research focuses on the design of effective algorithms and methods for large-scale combinatorial search problems and practical applications. (pdf) Springer Vincent Derrien, J.M. Richer and Jin-Kao Hao, Plasma, a progressive algorithm for multiple sequence alignment (in French). Future Generation Computer Systems 106: 105-120, May 2020 (pdf, doi)Elsevier (Program Code is HERE) Xiangjing Lai, Jin-Kao Hao, Fred Glover. Draft (pdf, Doi) Wiley Adrien Goëffon, Jean-Michel Richer, Jin-Kao Hao, Heuristic methods for phylogenetic reconstruction with maximum parsimony. (pdf, doi) Elsevier Zhipeng Lü, Jin-Kao Hao, Fred Glover.Neighborhood Analysis: A Case Study on Curriculum-Based Course Timetabling. Breakout local search for the vertex separator problem. Intensification-driven tabu search for the minimum differential dispersion problem. Neighborhood decomposition-driven variable neighborhood search for capacitated clustering. Giglia Gomez Villouta, Jean-Philippe Hamiez, Jin-Kao Hao. A reinforced tabu search approch for 2D strip packing. Systematic and Stochastic biclustering algorithms for microarray data analysis. (postscript) Jean-Philippe Hamiez and Jin-Kao Hao, Recherche tabou et planification de rencontres sportives Tabu Search and sports league scheduling. Kernel-based tabu search for the Set-Union Knapsack Problem. Expert Systems with Applications 165: 113802, 1 March 2021 (pdf, doi) Elsevier. (Program Code is HERE)Mingjie Li, Jin-Kao Hao, Qinghua Wu. General swap-based multiple neighborhood adaptive search for the maximum balanced biclique problem. (Program Code and data files are HERE).Eduardo Rodriguez-Tello, Jin-Kao Hao, Hillel Romero-Monsivais. Engineering Applications of Artificial Intelligence 52: 81-91, 2016 (pdf, doi) Elsevier. Opposition-based memetic search for the maximum diversity problem. (pdf) Elsevier. (pdf, doi) Elsevier Fred Glover, Zhipeng Lü, Jin-Kao Hao. A multiple search operator heuristic for the max-k-cut problem. Le Thi Hoai An, Pascal Bouvry, Pham Dinh Tao (Eds.): MCO 2008, Communications in Computer and Information Science (CCIS) 14: 135-144, Springer, 2008 (pdf) Springer Edmundo Bonilla Huerta, Béatrice Duval and Jin-Kao Hao, Gene selection for Microarray data by a LDA-based genetic algorithm. A learning-based path relinking algorithm for the bandwidth coloring problem. Revue d'Intelligence Artificielle 16(6): 785-806, Hermes, 2002. Memetic search for the quadratic assignment problem. Computers & Operations Research 39(7): 1593-1600, 2012. Grégoire (Ed.): ICTAI 2010, pages 121-128, 2010. (pdf) IEEE CSP Wassim Ayadi, Mourad Elloumi, Jin-Kao Hao. M. Lixin Tang, Assistant Professor at Kunming University of Science and Technology, Faculty of Information Engineering and Automation)Liwen Li (2018-2019, visiting PhD student from Huazhong University of Science and Technology, supervised by Kun He) Zhen Shang (2017-2018, visiting PhD student from Northwestern Polytechnical University, supervised by Yang Wang, Assistant Professor at Chang'an University, School of Management) Ke-Qin Liu (2011-2013, visiting PhD student from Shanghai University, supervised by Xingming Zhao, Fudan University) Xiujun Zhang (2011-2013, visiting PhD student from Shanghai University, now Research Professor at Wuhan Botanical Garden, Chinese Academy of Sciences, supervised by Xingming Zhao, Fudan University) Jin-Kao Hao holds a full Professor position in the Department of Computer Science of the University of Angers (France) since 1999. (pdf) Wassim Ayadi, Mourad Elloumi, Jin-Kao Hao. Pizzuti (Eds.): EvoBIO 2011, Lecture Notes in Computer Science 6623: 134-145, 2011. In C. He has supervised and worked on several real world applications including business relationship inference in the Internet, antenna positioning and frequency assignment for mobile radio networks, daily photograph scheduling of an earth observation satellite, integrated scheduling of vehicles and drivers, sports league scheduling, timetabling and nurse rostering. Saubion) Vincent Derrien (Assistant Professor at the Higher Engineering School ESIGELEC, Regional scholarship, graduate of the University of Angers, PhD defense in March 2008, co-supervisor J.M. Richer) Raphaël Dorne (Senior research scientist at British Telecom's Advanced Communications Technology Centre, Suffolk, U.K., PhD defense in 1998, graduate of the University of Montpellier II) Fuda Ma (R&D Engineer, Huawei Technologies CO., Xi'an, China, CSC scholarship,graduate ofNorthwestern Polytechnical University, Xi'an, PhD Oct. Daniela Claro, Patrick Albers, Jin-Kao Hao, Web services composition. Proceedings of GECCO-2011, pages 1061-1068, July 12-16, 2011. List Graph Coloring for Multi-depot Vehicle Scheduling. International Journal of Mathematics in Operational Research 1(1-2): 228-245, 2009. Inderscience Publishers. (Program Code is available HERE) Una Benlic and Jin-Kao Hao. 2012 - May 2016) Daniela Claro (Associate Professor, Universidade Federal da Bahia, Brasil, co-supervisor P. Lecture Notes in Computer Science 4926: 124-135, Springer, 2008. Cowling (Eds.): EvoCOP 2009 (Best Paper Nominee), Lecture Notes in Computer Science 5482: 121–132, 2009. Genomics Proteomics & Bioinformatics6(2): 61-73, 2008. Path relinking for unconstrained binary quadratic programming.European Journal of Operational Research 223(3): 595-604, 2012. Proceedings of French Open Days on Biology, Computer Science and Mathematics (JOBIM-05), Lyon, July 6-8 2005. 1998. Rossi (Ed.): Proc. In P. (pdf) Philippe Galinier and Jin-Kao Hao, Tabu search for maximal constraint satisfaction problems. A Memetic Algorithm for Community Detection in Complex Networks. of the 19th International Joint Conference on Artificial Intelligence (IJCAI-05), pp187-192, Edinburgh, July-August, 2005. Sais (Ed.), "Problem SAT: progresses and challenges", Chapter 5, Draft (pdf), Hermes, 2008. A three-phase search approach for the quadratic minimum spanning tree problem. Engineering Applications of Artificial Intelligence 46: 113-130, 2015 (pdf, doi) Elsevier. Yang Wang, Jin-Kao Hao. (pdf) Springer. (Program Code is available HERE) Inès Sghir, Jin-Kao Hao, Ines Ben Jaafar, Khaled Ghédira. Pavone (Eds.): PPSN 2012, Lecture Notes in Computer Science 7492: 327-336, 2012. Engineering Applications of Artificial Intelligence46: 269-278, 2015 (pdf, doi) Elsevier. Selected papers from the 8th International Conference on Artificial Evolution (AE-07). pp539-544. Fonseca (Eds.): EMO 2013, Lecture Notes in Computer Science 7811: 185-199, 2013. Inferring gene regulatory networks from gene expression data by PC-algorithm based on conditional mutual information. Selected papers from AE-03, Lecture Notes in Computer Science 2936: 103-114, Springer-Verlag, 2004. Yang Wang,Jin-Kao Hao, Fred Glover, Zhipeng Lü. A tabu search based memetic algorithm for the maximum diversity problem. Engineering Applications of Artificial Intelligence 27: 103-114, 2014. Fyfe, N. European Journal of Operational Research239(2): 313-322, 2014 (pdf, doi) Elsevier(Program Code is HERE). Dynamic programming driven memetic search for the Steiner tree problem with revenues, budget and hop constraints. A three-phased local search approach for the Clique Partitioning problem.Journal of Combinatorial Optimization 32(2): 469-491, 2016 (pdf, doi)Springer. Lorenz dominance based algorithms to solve a practical multiobjective problem. BioData Mining 2:9, 2009. (pdf) Springer Eduardo Rodriguez-Tello, Jin-Kao Hao and José Torres-Jimenez, A refined evaluation function for the MinLA problem. EvoWorkshops 2003,Lecture Notes in Computer Science 2611: 258-268, Springer-Verlag, 2003. Jin-Kao Hao, Jean-Jacques Chabrier, Combining partial evaluation and constraint solving: a new approach to constraint logic programming. on Artificial Intelligence (ECAI-94), John Wiley & Sons, pp135-139, Amsterdam, Aug. Information Sciences 441: 79-94, 2018 (pdf, doi)Elsevier. An effective branch-and-bound algorithm for the maximum s-bundle problem. Nicosia, M. Merz (Eds.): EvoCOP 2010, Lecture Notes in Computer Science 6022: 145-165, 2010. (pdf) Springer Una Benlic and Jin-Kao Hao. Xing-Ming Zhao, Ke-Qin Liu, Guanghui Zhu, Feng He, Béatrice Duval, Jean-Michel Richer, De-Shuang Huang, Chang-Jun Jiang, Jin-Kao Hao, Luonan Chen. Michel Vasquez and Jin-Kao Hao, A heuristic approach for antenna positioning in cellular networks. Una Benlic and Jin-Kao Hao. In L. January 2021 (Program Code is HERE).Zhi Lu, Jin-Kao Hao, Una Benlic, David Lesaint. Artificial Intelligence Review 47(3): 367-394, 2017 (pdf, doi) Springer. Annals of Operations Research 248(1-2): 365-403, 2017 (pdf, doi) Springer Yan Jin, Jean-Philippe Hamiez, Jin-Kao Hao. Tetart, CH-SAT: a complete procedure for satisfiability problems. Brahim Chabane, Matthieu Basseur, Jin-Kao Hao. Engineering Applications of Artificial Intelligence 82: 76-84, 2019 (pdf, doi) Elsevier. In J. also worked on combinatorial problems encountered in Bioinformatics such as Machine learning meets optimization (PHC Cai Yuanpei Sino-French Program, 2018-2021) Operations and projects planning (CIFRE with GéPi Conseil, 2019-2022) Identification of biomarkers using integration of omics data (PHC Cai Yuanpei Sino-French Program, 2011-2013) Adaptive and intelligent search for optimization (Pays de La Loire Regional Project, 2009-2013) LigeRO (Operations research) (Pays de La Loire Regional Project, 2009-2013) PGMO (Gaspard Monge Program for Optimization and operations research, 2013-2015) Actions planning (CIFRE with GéPi Conseil, 2013-2017) BIL (BioInformatique Ligérienne, Pays de La Loire Regional Project 2007-2011) Integrated Vehicule and Crew Scheduling (CIFRE with PERINFO SA, 2004-2007, 2005-2008) Inference of Autonomous System Relationships in the Internet (France Telecom R&D, 2005-2006) Network design and topology optimization (France Telecom R&D, 2006-2008) Post-Genome (Bioinformatics, 2000-2006) Ouest Genopole (Bioinformatics, since 2001) Parallel metaheuristics for combinatorial problem solving (Franco-Mexican Joint Lab in Computer Science LAFMI, 2005-2006) Meta-heuristics for uncertain optimization (PRA and LIAMA 2000-2003) Meteor (Migration & Evolution of Telecom Equipment through Operations Research, RNRT, 2000-2002) Mobile radio networks: planning, evolution and optimization (CNRS Telecoms Programme, 2000-2001) Optimization and decision making in cork industry (CIFRE with SABATE, 1999-2002) ARNO (Algorithms for Radio Network Optimisation, ESPRIT 4, No. 23243, 1997-1999) FAP I & II (Frequency assignment for mobile radio networks, CNET - France Telecom, 1994-1997) OPT (Modern heuristics for optimisation, ANVAR, 1996-1997) Ongoing Ph.D. candidates Cyril Grelier (French PhD scholarship, graduate of the University of Angers, PhD starting Oct. Master thesis, INSA de Lyon, 1997. Ali (Eds.): IEA/AIE 2010, Lecture Notes in Artificial Intelligence6096: 1-10, 2010. (pdf, doi) Springer Hakim Mabed, Alexandre Caminada, Jin-Kao Hao. Yangming Zhou and Jin-Kao Hao. Computers & Operations Research 142: 105726, January 2022 (pdf, doi)Elsevier. (Program code and instances are HERE)Jintong Ren, Jin-Kao Hao, Feng Wu, Zhang-Hua Fu. An effective hybrid search algorithm for the multiple traveling repairman problem with profits. A Recombination-based tabu search algorithm for the winner determination problem. Valérie Guihaire and Jin-Kao Hao. Zelinka, V. (pdf, doi) Elsevier Qinghua Wu and Jin-Kao Hao. Wen Sun, Jin-Kao Hao, Xiangjing Lai, Qinghua Wu. Adaptive feasible and infeasible tabu search for weighted vertex coloring. Information Sciences 466: 203-219, 2018 (pdf, doi)Elsevier (Program Code is HERE) Yi Zhou, André Rossi, Jin-Kao Hao. A memetic algorithm for the minimum sum coloring problem. (pdf) Springer Daniel Cosmin Porumbel, Jin-Kao Hao, Pascale Kuntz. Position-Guided Tabu Search Algorithm for the Graph Coloring Problem. of 11th European Conf. of The 4th Intl. Rodriguez-Tello (Permanent Researcher at the Cinvestav Tamaulipas, Mexican CONACyT scholarship, PhD defense in July 2007, graduate of ITESM Cuernavaca, Mexico, in cooperation with J. PWC-02, Lecture Notes in Computer Science 2775: 541-554, Springer-Verlag, 2003. Rueda (Ed.) Microarray Image and Data Analysis: Theory and Practice. Bioinformatics 28(1): 94-104, 2012. Draft (pdf, doi) Oxford Journals Ke-Qin Liu, Zhi-Ping Liu, Jin-Kao Hao, Luonan Chen, Xing-Ming Zhao. Draft (pdf) Springer Jin-Hao Hao, Christine Solnon. Blum (Eds.): EvoCOP 2013, Lecture Notes in Computer Science 7832: 61-72, 2013. 2016 - July 2020, CSC scholarship,graduate of UTBM Belfort and Northwestern Polytechnical University, Xi'an)Eduardo A. Xiangjing Lai and Jin-Kao Hao. CP-06, Lecture Notes in Computer Science 4204: 716-720, Springer-Verlag, 2006. (pdf,doi) Springer(Program Code is HERE) Daniel Cosmin Porumbel, Jin-Kao Hao, Pascale Kuntz. An Efficient Algorithm for Computing the Distance Between Close Partitions. Discrete Applied Mathematics 159: 53-59, 2011. A multilevel memetic approach for improving graph k-partitions. IEEE Transactions on Evolutionary Computation15(5): 624-472, 2011. Path relinking algorithm for the vertex separator problem. Lecture Notes in Computer Science 4638: 197-201, Springer, 2007 (pdf) Springer Daniel Porumbel, Jin-Kao Hao and Pascale Kuntz, A study of evaluation functions for the graph K-coloring problem. Morgan Kaufmann Publishers. (pdf) Nicolas Pech-Gourg and Jin-Kao Hao, A genetic algorithm for the classification of natural corks. European Journal of Operational Research212(3): 464-472, 2011. Coello Coello, V. ADDITIONAL TOPICS IN PROBABILITY 9.1 The Poisson Process 9.2 Markov Chains 9.3 Surprise, Uncertainty, and Entropy 9.4 Coding Theory and Entropy Summary Problems and Theoretical Exercises Self-Test Problems and Exercises 10. Expert Systems with Applications 42(1): 355-365, 2015 (pdf, doi) Elsevier. (Program Code is HERE) Xiangjing Lai, Jin-Kao Hao, Zhipeng Lü, Fred Glover. Proc. 2009) Jintong Ren (Post-doc fellow at Chinese University of Hong Kong, Shenzhen, China; PhD study Oct. A "reduce and solve" approach for the multiple-choice multidimensional knapsack problem. Journal of Combinatorial Optimization 26(1): 86-108, 2013. (pdf, doi) Springer Jin-Kao Hao and Qinghua Wu. Improving the extraction and expansion method for large graph coloring. Applied Mathematics and Computation219(9): 4800-4815, 2013(pdf, doi)Elsevier(Program Code is HERE) Gary Kochenberger, Jin-Kao Hao, Zhipeng Lü, Haibo Wang, Fred Glover.Solving large scale max cut problems via tabu search. Journal of Heuristics19(4): 565-571, 2013 (pdf, doi) Springer Xiujun Zhang, Keqin Liu, Zhi-Ping Liu, Béatrice Duval, Jean-Michel Richer, Xing-Ming Zhao, Jin-Kao Hao, Luonan Chen. (pdf) Springer. Bui et al. European Journal of Operational Research207(3): 1254-1262, 2010. (pdf), Inderscience Publishers Daniel Cosmin Porumbel, Jin-Kao Hao, Pascale Kuntz. An Evolutionary Approach with Diversity Guarantee and Well-Informed Grouping Recombination for Graph Coloring. Computers & Operations Research 37(10): 1822-1832, 2010. A hybrid metaheuristic approach for the capacitated arc routing problem. of the 17th Intl. Boosting the performance of metaheuristics for the MinLA problem using a more discriminating evaluation function. An improved Simulated Annealing algorithm for bandwidth minimization. Meta-heuristics and artificial intelligence. Albers, PhD Oct. Diversity-preserving quantum particle swarm optimization for the multidimensional knapsack problem. Expert Systems with Applications 149: 113310, July 2020 (pdf, doi) Elsevier. (Program Code is HERE)Zhi Lu, Jin-Kao Hao, Qinghua Wu. A hybrid evolutionary algorithm for finding low conductance of large graphs. of 2nd IEEE Intl. (pdf, doi) Springer. Wen Sun, Jin-Kao Hao, Xiangjing Lai, Qinghua Wu. On feasible and infeasible search for equitable graph coloring. RAIRO Operational Research 35(4): 415-438, 2001. In C. PRIB 2010, Lecture Notes in Bioinformatics 6282: 211-221, 2010.(pdf) Springer Sami Laroum, Dominique Tessier, Béatrice Duval, Jin-Kao Hao. Frequent pattern based search: A case study on the quadratic assignment problem. IEEE Transactions on Systems, Man, and Cybernetics: Systems 52(3): 1503-1505, March 2022 (pdf, doi)IEEE CSP.(Program Code is HERE).Zuo-cheng Li, Lixin Tang, Jin-Kao Hao. ACM Press. (pdf, doi) Elsevier Jin-Kao Hao and Una Benlic. Lower Bounds for the ITC-2007 Curriculum-Based Course Timetabling Problem. Multi-neighborhood tabu search for the maximum weight clique problem. Annals of Operations Research 196(1): 611-634, 2012. A Study of Memetic Search with Multi-parent Combination for UBQP. II, pp97-106, Jan. Jean-Philippe Hamiez and Jin-Kao Hao, A linear-time algorithm to solve the sports league scheduling problem. Pattern-driven neighborhood search for biclustering of microarray data. BMC Bioinformatics 13(Suppl 7):S11, 2012. European Journal of Operational Research 254(3):780-800, 2016 (pdf, doi) Elsevier. CP-96, Lecture Notes in Computer Science 1118: 194-208, Aug. Hervé Deleau, Jin-Kao Hao and Frédéric Saubion, Hybrid strategies for solving constraint satisfaction problems (in French). In his capacity as a Professor, he has supervised 41 defended PhD theses and 7 post-doc till 2021 and served on more than 140 PhD or Habilitation Examination Boards (in France and abroad).He has held or still holds a number of national responsabilities including Member of the National Council of Universities (CNU 27) nominated by the French Higher Education and Research Ministry, Panel Member of the Scientific Evaluation Committee CES 40 "Mathematics, Computer Science, Systems and Communications Engineering" and Panel Member of the SIMI 2 Board (Basic Research and International Joint Research) for the French National Research Agency ANR; Member of the National Jury for attibuting the "Research Excellence Bonus"; Invited Expert of proposal evaluation for research agencies (Eurostars-EUREKA, FNRS-Belgium, NSERC-Canada, FONDECYT & CONICYT-Chile, CNSF-China, RGC Hong Kong-China, ISF-Israel, CORE-Luxembourg, NCSTE-Kazakhstan, CNCS-Romania, SSF-Slovakia, SNF-Switzerland, EPSRC-UK etc); Member of the Jury for the French OR Society Roadef's "Robert Faure Prize"; Member of Regional Jury for the "5th National Challenge for Hi-Tech Company Creation" of the French Research and New Technology Ministry; Evaluation expert of French research Labs; External member of Searching Committee for several Universities.Jin-Kao Hao was born in Nov. (Program Code is HERE)Qing Zhou, Jin-Kao Hao, Zhe Sun, Qinghua Wu. Memetic search for composing medical crews with equity and efficiency. Adaptive Tabu Search for Course Timetabling. European Journal of Operational Research 200(1): 235-244, 2010. Applied Soft Computing13(10): 4118-4132, 2013. (pdf, doi)Elsevier Matthieu Basseur, Rongqiang Zeng, Jin-Kao Hao. A Study of Breakout Local Search for the Minimum Sum Coloring problem. 2011, co-supervisor M. Knowledge-Based Systems 188: 105000, January 2020 (pdf, doi)Elsevier. (pdf,doi) IGI Global. Fred Glover and Jin-Kao Hao. Fast 2-flip Move Evaluations for Binary Unconstrained Quadratic Optimization Problems.International Journal of Metaheuristics 1(2):100-107, 2010. Xiangjing Lai and Jin-Kao Hao. He received his Master degree (Oct. Dominique Tessier, Sami Laroum, Béatrice Duval, Emma M Rath, W. Hakim Mabed, Alexandre Caminada and Jin-Kao Hao, Impact of tradeoff between blocking and interference on TDMA cell capacity planning. Berlin, Germany. (Program Code is HERE) Qing Zhou, Una Benlic, Qinghua Wu, Jin-Kao Hao. Heuristic search to the capacitated clustering problem. (pdf). Springer Michel Vasquez and Jin-Kao Hao, A hybrid approach for the multidimensional 0-1 knapsack problem. The bi-objective quadratic multiple knapsack problem: model and heuristics. An effective iterated tabu search for the maximum bisection problem. Future Generation Computer Systems 101: 1005-1017, 2019 (pdf, doi)Elsevier (Program Code is HERE) Zhi Lu, Jin-Kao Hao, Yi Zhou. Improving probability learning based local search for graph coloring. In Idoumghar et al. (pdf, doi)IEEE CSP Una Benlic and Jin-Kao Hao. An effective multilevel tabu search approach for balanced graph partitioning. (pdf, doi) Springer. Leite (Eds.): JELIA 2014, Lecture Notes in Artificial Intelligence 8761: 582-590, 2014. Saubion, PhD defence in 2005, graduate of the University of Angers) Samir Laroum (Private sector, PhD Oct. European Journal of Operational Research 185(3): 1319-1335, 2008. Ines Sghir, Jin-Kao Hao, Ines Ben Jaafar, Khaled Ghédira. In N. (pdf, doi) Oxford Journals Wassim Ayadi and Jin-Kao Hao. (pdf) Springer Qinghua Wu and Jin-Kao Hao. 2018, co-supervisor Dr. A. Draft (pdf, doi) BioMed Central Daniel Cosmin Porumbel, Jin-Kao Hao, Fred Glover. A Simple and Effective Algorithm for the MaxMin Diversity Problem. Selected papers from AE-01, Leture Notes in Computer Science 2310: 192-204, Springer, 2002. Joint Conference on Artificial Intelligence (IJCAI-01), pages 328-333, Seattle, Washington, USA, August 2001. Garcia-Pedrajas, F. (The new STPRBH graphs are available HERE)Yuning Chen and Jin-Kao Hao. of Young Computer Scientists, pp2.23-2.28, Beijing, Chine, July 1993, Tsinghua University Press. (Program Code is HERE). The unconstrained binary quadratic programming problem: a survey. Middendorf and C. (pdf, doi)IEEE. European Journal of Operational Research 296(3): 788-803, 2022(pdf, doi) Elsevier. Journal of Combinatorial Optimization. Benchmark instances are HERE. Spacing memetic algorithms. (pdf, doi), Elsevier Adrien Goëffon, Jean-Michel Richer and Jin-Kao Hao, Progressive tree neighborhood applied to the Maximum Parsimony problem. (pdf) Springer Adrien Goëffon, Jean-Michel Richer and Jin-Kao Hao, Local search for the maximum parsimony problem. Lecture Notes in Artificial Intelligence 2148: 24-36, Springer-Verlag, 2001. (pdf) MIT Press José Crispin Hernandez Hernandez, Béatrice Duval and Jin-Kao Hao. (pdf), Oxford Journals Valérie Guihaire and Jin-Kao Hao. Jin-Kao Hao, Raphaël Dorne and Philippe Galinier, Tabu search for frequency assignment in mobile radio networks. of 11th Annual Conference on Genetic and Evolutionary Computation (GECCO-09), pages 201-208, Montreal, Canada, July 2009. Expert Systems with Applications 82: 332-343, 2017 (pdf, doi) Elsevier. Draft (pdf) Springer Philippe Galinier, Jean-Philippe Hamiez, Jin-Kao Hao, Daniel Cosmin Porumbel. (pdf) SpringerJin-Hao Hao and Christine Solnon. 2021(pdf, doi) IEEE CS.Xiangjing Lai, Jin-Kao Hao, Zhang-Hua Fu, Dong Yue. Solving the Latin square completion problem by memetic graph coloring. Computational Optimization and Applications 20(2): 137-157, 2001. Xiangjing Lai, Jin-Kao Hao, Fred Glover, Dong Yue. (pdf) Jin-Kao Hao, Metaheuristics for combinatorial optimization (slides of a tutorial). Fred Glover and Jin-Kao Hao. Madhu Chetty, Alioune Ngom, Shandar Ahmad (Eds.): PRIB 2008, Lecture Notes in Bioinformatics 5265: 252-263, Springer-Verlag, 2008 (pdf) Sprigner José Crispin Hernandez Hernandez, Béatrice Duval and Jin-Kao Hao, SVM-based local search for gene selection and classification of Microarray data. (pdf) Eduardo Rodriguez-Tello, Jin-Kao Hao, Jose Torres-Jimenez, An improved evaluation function for the bandwidth minimization problem. 1996. European Journal of Operational Research 264(1): 55-65, 2018(pdf, doi) Elsevier. Alexandre Caminada, Jin-Kao Hao, Jean-Luc Lutton and Vincent Martin, Telecommunication networks. A Study of Multi-Parent Crossover Operator in a Memetic Algorithm. In R. Jean-Michel Richer, Vincent Derrien, and Jin-Kao Hao. Yuning Chen, Jin-Kao Hao, Fred Glover. Breakout local search for the max-cut problem. 1991) from the University of Franche-Comte, supervised by Prof. Dynamic thresholding search for Minimum Vertex Cover in massive sparse graphs. Yan Jin and Jin-Kao Hao. Applied Soft Computing 94: 106440, September 2020 (pdf, doi) Elsevier. (Program Code is HERE)Daniel Porumbel and Jin-Kao Hao. (pdf) Jin-Kao Hao and Raphaël Dorne, An empirical comparison of two evolutionary methods for satisfiability problems. 2008 - Nov 2011, Regional scholarship, from University of Montouri Constantine, Alegeria, Master of University of Montpellier, France, co-supervisors B. IEEE Access 7: 98436-9845, 2019. (pdf) Elsevier Eduardo Rodriguez-Tello, Jin-Kao Hao and José Torres-Jimenez. Breakout local search for the Steiner tree problem with revenue, budget and hop constraints. In E. Olivier Gach and Jin-Kao Hao. Information Sciences 569: 184-204, 2021.(pdf, doi) Elsevier. Iterated Local Search for the Multiple Depot Vehicle Scheduling Problem. Computers & Industrial Engineering 57(1): 277-286, 2009. European Journal of Operational Research 218(3): 865-876, 2012. PeerJ Computer Science April2022(pdf, doi)PeerJ Publishing.Jintong Ren, Jin-Kao Hao, Feng Wu, Zhang-Hua Fu. Intensification-driven local search for the traveling repairman problem with profits.Accepted to Expert Systems with Applications, March 2022 (pdf, doi)Elsevier. (Program code and instances are HERE)Lixin Tang, Zuo-cheng Li, Jin-Kao Hao. Solving the single row facility layout problem by k-medoids memetic permutation group. Cotta and P. On monte carlo tree search for weighted vertex voloring. Computers & Operations Research 136: 105447, 2021 (pdf, doi)Elsevier. (Program Code is HERE)Zhi Lu, Yi Zhou, Jin-Kao Hao. Knowledge-Based Systems 212: 106581, January 2021 (pdf, doi)Elsevier (Program Code is HERE)Pengfei He and Jin-Kao Hao. (Program Code is HERE) Zhanghua Fu and Jin-Kao Hao. (pdf) Springer. Olivier Gach and Jin-Kao Hao. European Journal of Operational Research 257(1): 41-54, 2017 (pdf, doi) Elsevier (Program Code is HERE) Yangming Zhou and Jin-Kao Hao. EvoBIO 2007, Lecture Notes in Computer Science 4447: 90-101, Springer, 2007. on Artificial Neural Nets & Genetic Algorithms, pp289-295, April 1995. Duval)Yan Jin (Associate Professor at Huazhong University of Science and Technology, School of Computer Science and Engineering, CSC scholarship,graduate ofHUST, Wuhan, China, PhD study Sept. Workshop of the 11th DIMACS Implementation Challenge in Collaboration with ICERM: Steiner Tree Problems. Yang Wang, Zhipeng Lü, Fred Glover, Jin-Kao Hao.Probabilistic GRASP-tabu search algorithms for the UBQP problem. Computers & Operations Research 40(12): 3100-3107, 2013. Journal of Mathematical Modelling and Algorithms 3(1): 73-88, 2004. Information Sciences 334-335: 103-121, 2016 (pdf, doi)Elsevier. A fast heuristic algorithm for the critical node problem. 2021 (pdf, doi) Elsevier. (Program code and instances are HERE) Xiangjing Lai, Jin-Kao Hao, Dong Yue, Zhipeng Lü, Zhang-Hua Fu. Iterated dynamic thresholding search for packing equal circles into a circular container. (pdf) Springer Sami Laroum, Dominique Tessier, Béatrice Duval, Jin-Kao Hao. IEEE Transactions on Systems, Man, and Cybernetics: Systems 45(4): 624-635, 2015 (pdf, doi) IEEE SMC Zhanghua Fu and Jin-Kao Hao. (pdf, doi) Elsevier Una Benlic and Jin-Kao Hao. Annals of Operations Research 186(1): 275-293, 2011. (pdf) Springer Zhipeng Lü, Jin-Kao Hao, Fred Glover. A new dynamic programming algorithm for multiple sequence alignment. COCOA 2007, Lecture Notes in Computer Science 4616: 52-61, Springer-Verlag, 2007. Press of Know epia2017/ledge Systems Institute 1992. (pdf) Jin-Kao Hao, Jean-Jacques Chabrier, A modular architecture for constraint logic programming. He contributed to practical solutions of significant NP-hard problems like graph coloring and sum coloring, maximum clique, combinatorial auctions, bandwidth and linear arrangement minimization, graph partitioning and clustering, vertex separator, MaxSAT, multiple-choice and multidimensional 0-1 knapsack problem, quadratic optimization, constraint satisfaction, Steiner and Spanning tree problems as well as various applications in the areas of bioinformatics, data mining, telecommunication networks and transportation, among others. His work with his co-authors has been featured in International Conferences (AE, CP, CPAIOR, ECAI, EvoBIO, EvoCOP, EMO, GECCO, IEEE CEC, ICTAI, IJCAI, MIC, PPSN) and Journals (Annals of Operations Research, Applied Mathematics and Computation, Applied Soft Computing, Artificial Intelligence Review, Asia-Pacific Journal of Operational Research, European Journal of Operational Research, Computers & Industrial Engineering, Computers & Operations Research, Computational Optimization & Applications, Discrete Applied Mathematics, 4OR, Mathematical Programming Computation, Engineering Applications of Artificial Intelligence, Expert Systems with Applications, Evolutionary Computation, Future Generation Computer Systems, IEEE Transactions on Cybernetics, IEEE Transactions on Evolutionary Computation, IEEE Transactions on Systems, Man, and Cybernetics: Systems, INFORMS Journal on Computing, Information Sciences, Journal of Combinatorial Optimization, J. (Program Code is HERE) Yangming Zhou, Jin-Kao Hao, Fred Glover. Edmundo Bonilla Huerta, Béatrice Duval and Jin-Kao Hao, Fuzzy logic for elimination of redundant information of microarray data. Caminada) Michel Vasquez (Permanent researcher at the LGI2P Lab, National Higher Engineering School "Ecole des Mines d'Ales", France, PhD defense in 2000, graduate of the Ecole des Mines d'Ales) Yang Wang (Full Professor at Northwestern Polytechnical University, ManagementSchool, Xi'an, China, CSC scholarship,graduate of NPU, PhD study Oct 2009 - February 2013) Qinghua Wu (Full Professor at Huazhong University of Science and Technology, ManagementSchool, Wuhan, China, CSC scholarship,graduate of HUST,PhD study Oct 2009 - February 2013) Rongqiang Zeng (Assistant Professor at Southwest Jiaotong University,CSC scholarship,graduate of University of Electronic Science and Technology of China, Chengdu, PhD study Dec. Computers & Operations Research43(3): 318-327, 2014. European Journal of Operational Research 299(1): 137-153, May 2022 (pdf, doi) Elsevier. (Program Code is HERE).Yangming Zhou, Jin-Kao Hao, Beatrice Duval. (pdf) Springer Mériéma Bélaidouni and Jin-Kao Hao, SAT, local search dynamics and density of states. (pdf) Springer. (pdf) Springer Hakim Mabed, Alexandre Caminada and Jin-Kao Hao, Multi-period channel assignment. Transportation Research Part A: Policy and Practice 42: 1251-1273, 2008. (pdf) Springer Jin-Kao Hao and Raphaël Dorne, Empirical studies of heuristic local search for constraint solving. Memetic search for the generalized quadratic multiple knapsack problem. T. 2006 - Nov. MICAI 2007, Special Session, pages 264-274, 2007. Jean-Jacques Chabrier of the University of Burgundy (Dijon, France) and the Professorship Diploma HDR (Habilitation a Diriger des Recherches) (Jan. An Effective Multilevel Memetic Algorithm for Balanced Graph Partitioning. In P.I. Cowling, P. Caminada, France Telecom R&D, PhD defense in 2003) Nicolas Pech-Gourg (Associate Professor at the Higher Engineering School IMERIR, France, PhD defense in 2002,graduate of the Ecole des Mines d'Ales) Daniel Porumbel (Associate Professor at CNAM Paris, co-supervisor P. (pdf, doi)Elsevier Qinghua Wu and Jin-Kao Hao. A hybrid metaheuristic method for the maximum diversity problem. (Program Code is HERE).Jintong Ren, Jin-Kao Hao, Eduardo Rodriguez-Tello, Liwen Li, Kun He. A new iterated local search algorithm for the cyclic bandwidth problem. Knowledge-Based Systems 203: 106136, September 2020 (pdf, doi)Elsevier. (Program Code is available HERE)Ji Lu, Yuning Chen, Jin-Kao Hao, Renjie He. The time-dependent electric vehicle routing problem: model and solution. Advances in Metaheuristics for Gene Selection and Classification of Microarray Data. Briefings in Bioinformatics 11(1): 127-141, 2010. A Search Space Cartography for Guiding Graph Coloring Heuristics. Computers & Operations Research 37(4): 769-778, 2010. on Evolutionary Computation, Perth, Australia, Nov.-Dec. Population-based gradient descent weight learning for graph coloring problems. Xiangjing Lai, Jin-Kao Hao, Fred Glover, Zhipeng Lü. Research in Computing Science 23: 99-107, 2006. J. Tabu search with graph reduction for finding maximum balanced bicliques in bipartite graphs. Knowledge-Based Systems 92: 23-34, 2016 (pdf, doi)Elsevier. Snyers (Eds.), Selected papers from the European Conference on Artificial Evolution (AE-97), Nimes, Oct. A Guided Tour of Artificial Intelligence II, Chapter 2, pages 27-52, 2020. Expert Systems with Applications 139: 112856, January 2020 (pdf, doi) Elsevier. (Program Code is HERE)Wen Sun, Jin-Kao Hao, Wenyu Wang, Qinghua Wu. Memetic search for the equitable coloring problem. Legrand et al. Computers & Operations Research 104: 1-14, 2019 (pdf, doi)Elsevier Yi Zhou and Jin-Kao Hao. (Program Code is available HERE). 1. (pdf) Elsevier Eduardo Rodriguez-Tello, Jin-Kao Hao, José Torres-Jimenez. European Journal of Operational Research 289(3): 1067-1086, 2021.(pdf, doi) Elsevier. (Program Code is HERE)Zequn Wei and Jin-Kao Hao. of Heuristics, Intl. (pdf, doi), Springer Jean-Philippe Hamiez, Jin-Kao Hao. Cotta, P. (pdf) Jin-Kao Hao and Jérôme Pannier, Etude expérimentale de recherche locale pour la résolution de contraintes. (Draft version pdf) Pengfei He, Jin-Kao Hao. Inès Sghir, Jin-Kao Hao, Inès Ben Jaafar, Khaled Ghédira. An adaptive multistart tabu search approach to solve the maximum clique problem. RANDOM VARIABLES 4.1 Random Variables 4.2 Discrete Random Variables 4.3 Expected Value 4.4 Expectation of a Function of a Random Variable 4.5 Variance 4.6 The Bernoulli and Binomial Random Variables 4.7 The Poisson Random Variable 4.8 Other Discrete Probability Distributions 4.9 Expected Value of Sums of Random Variables 4.10 Properties of the Cumulative Distribution Function Summary Problems Theoretical Exercises Self-Test Problems and Exercises 5. Computers & Operations Research 111: 43-57, 2019 (pdf, doi)Elsevier (Program Code is HERE)Fred Glover and Jin-Kao Hao. Bret Church, Jin-Kao Hao. Cowling (Eds.): EvoCOP 2009, Lecture Notes in Computer Science 5482: 61–72, 2009. (pdf) Springer Sami Laroum, Dominique Tessier, Béatrice Duval, Jin-Kao Hao. Multi-neighborhood search for discrimination of signal peptides and transmembrane segments. In M. 1987) from the National Institute of Applied Sciences (INSA Lyon, France), his Ph.D. in Constraint Programming (Feb. Draft (pdf)ACM Press. Giacobini (Eds.): EvoBIO 2009, Lecture Notes in Computer Science 5483: 164-175, 2009. Diversification-based learning in computing and optimization. An evolutionary path relinking approach for the quadratic multiple knapsack problem. 2008 - June 2012, co-supervisor M. (Best Paper Nominee, Parallel Problem Solving from Nature - PPSN V, Amsterdam, The Netherlands, Sept, 1998) (pdf) Springer Jin-Kao Hao, Evelyne Lutton, Edmund Ronald, Marc Schoenauer and D. 2006, graduate of the University of Angers) Giglia Gomez-Villouta (Professor at the Universidad of Valparaiso, Chile, co-supervisor J.P. Hamiez, PhD defense in Sept 2010) Valérie Guihaire (R&D Engineer, PhD defense in December 2009, Industrial research grant CIFRE with PERINFO SA, graduate of the Universite Catholique de l'Ouest) Jean-Philippe Hamiez (Associate Professor at University of Angers, PhD defense in 2002, graduate of the University of Amiens) José Crispin Hernandez Hernandez (Associate Professor at the Instituto Tecnologico Apizaco, Tlaxcala, Mexico, PhD Nov. Neighborhood decomposition based variable neighborhood search and tabu search for maximally diverse grouping. Yang Wang, Zhipeng Lu, Fred Glover, Jin-Kao Hao. Effective Variable Fixing and Scoring Strategies for Binary Quadratic Programming. In P. Computers & Operations Research 119: 104922, July 2020 (pdf, doi)Elsevier. (pdf) Springer Zhipeng Lü, Fred Glover, Jin-Kao Hao.Neighborhood Combination for Unconstrained Binary Quadratic Problems. To use our Plasma multiple alignment tool, click here. (pdf) Springer Jin-Kao Hao. (pdf) Springer Benoit Laurent, Valerie Guihaire and Jin-Kao Hao, A heuristic solution for a driver-vehicule scheduling problem. In M. A study of two evolutionary/tabu search approaches for the generalized max-mean dispersion problem. 1996. (pdf) Springer Jin-Kao Hao and Laurent. Journal of Heuristics 25(4-5): 521-537, 2019.(pdf, doi) Springer Yongliang Lu, Jin-Kao Hao, Qinghua Wu. Hybrid evolutionary search for the traveling repairman problem with profits. (pdf) Jin-Kao Hao, Frédéric Lardeux and Frédéric Saubion, Evolutionary computing for the satisfiability problem. CRC Press / Taylor & Francis, December 2014. Edmundo Bonilla Huerta, Béatrice Duval and Jin-Kao Hao, A hybrid GA/SVM approach for gene selection and classification of Microarry data. 2004 - Nov. ECAI-96 Workshop on Advances in Propositional Deduction, pp27-38, Aug. (pdf, doi)Elsevier. of Mathematical Modelling and Algorithms, Intl J. Joint Conference on Artificial Intelligence (IJCAI-13), IJCAI/AAAI Press, pages 461-467, Beijing, China, August 2013. Selected papers from AE-03, Lecture Notes in Computer Science 2936: 79-90, Springer-Verlag, 2004. Duval) Yi Zhou (Associate Professor at University of Electronic Science and Technology of China, School of Computer Science and Engineering, Chengdu, China, CSC scholarship,graduate of UEST, PhD study Sept. (Program Code is HERE) Qinghua Wu and Jin-Kao Hao. Genetic Tabu Search for robust channel assignment under dynamic traffic data. PPSN-96, Lecture Notes in Computer Science 1141 : 801-810, Sept. (pdf) Springer Valérie Guihaire and Jin-Kao Hao. Improving Timetable Quality in Scheduled Transit Networks. Expert Systems with Applications 173: 114684, July 2021 (pdf, doi) Elsevier.Olivier Goudet, Béatrice Duval, Jin-Kao Hao. Applied Soft Computing 62: 1056-1065, 2018 (pdf, doi) Elsevier. 1961 in China. Adaptive memory-based local search for Max-SAT. Applied Soft Computing 16(8): 2063-2071, 2012. (pdf, doi) Elsevier. Survey on biclustering of gene expression data. Martello, I.H. Osman, C. Jin-Kao Hao, A study of partial evaluation for constraint logic programming (in French). Roucairol (Eds.), Kluwer, 1998. An extraction and expansion approach for graph coloring.Asia-Pacific Journal of Operational Research30(5): 1350018, 2013. 2016-July 2020, CSC scholarship,graduate ofUniversity of Electronic Science and Technology of China, Chengdu)Hakim Mabed (Associate Professor at the University of Franche-Comte, co-supervised by A. PPSN-00, Lecture Notes in Computer Science 1917: 49-58, Springer-Verlag, 2000 (pdf) Springer Mériéma Bélaidouni and Jin-Kao Hao, Landscapes of the maximal constraint satisfaction problem. Raphael Dorne, Jin-Kao Hao, Tabu search for graph coloring, T-colorings and set T-colorings. Meta-heuristics: Advances and Trends in Local Search Paradigms for Optimization, Chapter 6, pp77-92, S. (pdf) EDP Sciences. Two phased hybrid local search for the periodic capacitated arc routing problem. Bioinformatics 29(1):106-13, 2013. Backtracking Based Iterated Tabu Search for Equitable Coloring. Computers & Operations Research 72: 118-127, 2016. Recent advances in graph vertex coloring. April 2001 (English version is here pdf) (French version is here pdf) Jin-Kao Hao, Metaheuristics for combinatorial optimization and constrained solving (in French). Iterated backtrack removal search for finding k-vertex-critical subgraphs. (pdf), Inderscience Publishers Fred Glover, Jin-Kao Hao, Gary Kochenberger. Applied Soft Computing 105: 107260, July2021 (pdf, doi) Elsevier. (Program Code is HERE).Liwen Li, Zequn Wei, Jin-Kao Hao, Kun He. Probability learning based tabu search for the Budgeted Maximum Coverage Problem. Expert Systems with Applications 183: 115310, Nov.

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