Constraint Programming

- In CP a problem is defined from:
  - variables with possible values (domain)
  - constraints

- Domain can be discrete or continuous, symbolic values or numerical values

- Constraints express properties that have to be satisfied

Principles Of Constraint Programming

Rachel Sandford

Principles Of Constraint Programming:

Principles of Constraint Programming Krzysztof Apt,2003-08-28 Constraints are everywhere most computational problems can be described in terms of restrictions imposed on the set of possible solutions and constraint programming is a problem solving technique that works by incorporating those restrictions in a programming environment It draws on methods from combinatorial optimisation and artificial intelligence and has been successfully applied in a number of fields from scheduling computational biology finance electrical engineering and operations research through to numerical analysis This textbook for upper division students provides a thorough and structured account of the main aspects of constraint programming The author provides many worked examples that illustrate the usefulness and versatility of this approach to programming as well as many exercises throughout the book that illustrate techniques test skills and extend the text Pointers to current research extensive historical and bibliographic notes and a comprehensive list of references will also be valuable to professionals in computer science and artificial intelligence *Principles and Practice of Constraint Programming - CP'99* Joxan Jaffar,2004-06-02 This book constitutes the refereed proceedings of the 5th International Conference on Principles and Practice of Constraint Programmingm CP 99 held in Alexandria Virginia USA in October 1999 The 30 revised full papers presented together with three invited papers and eight posters were carefully reviewed and selected for inclusion in the book from a total of 97 papers submitted All current aspects of constraint programming and applications in various areas are addressed Principles and Practice of Constraint Programming Vijay Saraswat,Pascal Van Hentenryck,1995 Constraint programming aims at supporting a wide range of complex applications which are often modeled naturally in terms of constraints Early work in the 1960s and 1970s made use of constraints in computer graphics user interfaces and artificial intelligence Such work introduced a declarative component in otherwise procedural systems to reduce the development effort *Principles and Practice of Constraint Programming - CP 2009* Ian P. Gent,2009-09-19 This volume contains the papers presented at CP 2009 The 15th International Conference on Principles and Practice of Constraint Programming It was held from September 20 24 2009 at the Rectory of the New University of Lisbon Portugal Everyone involved with the conference thanks our sponsors for their support There were 128 submissions to the research track of which 53 were accepted for a rate of 41 4% Each submission was reviewed by three reviewers with a small number of additional reviews obtained in exceptional cases Each review waseitherbyaProgrammeCommitteemember orbyacolleagueinvitedtohelp by a committee member thanks to their particular expertise Papers submitted as long papers were accepted at full length or not at all It is important to note that papers submitted as short papers were held to the same high standards of qualityas long papers There is thus no distinction in these proceedings between long and short papers except of course the number of pages they occupy As it happens the acceptancerates of short and long papers wereverysimilar indeed Therewere13submissionstotheapplicationtrack ofwhich8wereaccepted fora rateof61 5% Papersunderwentthe

samereviewprocessasregularpapers and there was not a separate committee for reviewing application track papers However papers in the application track were not required to be original or novel research but to be original and novel as an application of constraints   *Principles and Practice of Constraint Programming - CP 2001* Toby Walsh,2003-06-30 This book constitutes the refereed proceedings of the 7th International Conference on Principles and Practice of Constraint Programming CP 2001 held in Paphos Cyprus in November December 2001 The 37 revised full papers 9 innovative applications presentations and 14 short papers presented were carefully reviewed and selected from a total of 135 submissions All current issues in constraint processing are addressed ranging from theoretical and foundational issues to advanced and innovative applications in a variety of fields   *Principles and Practice of Constraint Programming - CP 2003* Francesca Rossi,2003-11-18 This volume contains the proceedings of the Ninth International Conference on Principles and Practice of Constraint Programming CP 2003 held in Kinsale Ireland from September 29 to October 3 2003 Detailed information about the CP 2003 conference can be found at the URL http www cs ucc ie cp2003 The CP conferences are held annually and provide an international forum for the latest results on all aspects of constraint programming Previous CP conferences were held in Cassis France in 1995 in Cambridge USA in 1996 in Schloss Hagenberg Austria in 1997 in Pisa Italy in 1998 in Alexandria USA in 1999 in Singapore in 2000 in Paphos Cyprus in 2001 and in Ithaca USA in 2002 Like previous CP conferences CP 2003 again showed the interdisciplinary nature of computing with constraints and also its usefulness in many problem domains and applications Constraint programming with its solvers languages theoretical results and applications has become a widely recognized paradigm to model and solve successfully many real life problems and to reason about problems in many research areas   Principles and Practice of Constraint Programming J. Christopher Beck,2017-08-22 This book constitutes the refereed conference proceedings of the 23nd International Conference on Principles and Practice of Constraint Programming CP 2017 held in Melbourne Australia from August 28 2017 until September 1 2017 The conference is colocated with the 20th International Conference on Theory and Applications of Satisfiability Testing SAT 2017 and the 33rd International Conference on Logic Programming The 46 revised full papers presented were carefully reviewed and selected from 115 submissions The scope of the contributions includes all aspects of computing with constraints including theory algorithms environments languages models systems and applications such as decision making resource al location scheduling configuration and planning The papers are grouped into the following tracks technical track application track machine learning operations research satisfiability journal sister conference track   **Principles and Practice of Constraint Programming - CP 2006** Frédéric Benhamou,2006-09-26 This book constitutes the refereed proceedings of the 12th International Conference on Principles and Practice of Constraint Programming CP 2006 held in Nantes France in September 2006 The 42 revised full papers and 21 revised short papers presented together with extended abstracts of four invited talks were carefully reviewed and selected from 142 submissions

All current issues of computing with constraints are addressed   *Principles and Practice of Constraint Programming* Alan Borning,2014-01-15   *Principles and Practice of Constraint Programming* Barry O'Sullivan,2014-08-13 This book constitutes the refereed conference proceedings of the 20th International Conference on Principles and Practice of Constraint Programming CP 2014 held in Lyon France in September 2014 The 65 revised papers presented together with 4 invited talks were carefully selected from 108 submissions The scope of CP 2014 includes all aspects of computing with constraints including theory algorithms environments languages models systems and applications such as decision making resource allocation and agreement technologies   *Principles and Practice of Constraint Programming - CP 2004* Mark Wallace,2004-09-13 The 10th International Conference on the Principles and Practice of Constraint Programming CP 2003 was held in Toronto Canada during September 27 October 1 2004 Information about the conference can be found on the Web at http ai uwaterloo ca cp2004 Constraint programming CP is about problem modelling problem solving programming optimization software engineering databases visualization user interfaces and anything to do with satisfying complex constraints It reaches into mathematics operations research arti cial intelligence algorithms c plexity modelling and programming languages and many aspects of computer science Moreover CP is never far from applications and its successful use in industry and government goes hand in hand with the success of the CP research community Constraintprogrammingcontinuesto beanexciting ourishingandgrowing research eld astheannualCPconferenceproceedingsamplywitness Thisyear from 158 submissions we chose 46 to be published in full in the proceedings Instead of selecting one overall best paper we picked out four distinguished papers though we were tempted to select at least 12 such papers In addition we included 16 short papersin the proceedings these were presentedas posters at CP 2004 This volume includes summaries of the four invited talks of CP 2004 Two speakers from industry were invited However these were no ordinary industrial representatives buttwoofthe leadingresearchersinthe CPcommunity Helmut Simonis of Parc Technologies until its recent takeover by Cisco Systems and Jean Francoi s Puget Director of Optimization Technology at ILOG The other two invited speakers are also big movers and shakers in the researchcommunity   Principles and Practice of Constraint Programming - CP '95 Ugo Montanari,1995-09-06 This book constitutes the proceedings of the First International Conference on Principles and Practice of Constraint Programming CP 95 held in Cassis near Marseille France in September 1995 The 33 refereed full papers included were selected out of 108 submissions and constitute the main part of the book in addition there is a 60 page documentation of the four invited papers and a section presenting industrial reports Thus besides having a very strong research component the volume will be attractive for practitioners The papers are organized in sections on efficient constraint handling constraint logic programming concurrent constraint programming computational logic applications and operations research   *Principles and Practice of Constraint Programming - CP 2010* David Cohen,2010-08-30 The 16th annual International Conference on the Principles and Practice of

Constraint Programming CP 2010 was held in St Andrews Scotland during September 6 10 2010 We would like to thank our sponsors for their generous support of this event This conference is concerned with all aspects of computing with constraints including theory algorithms applications environments languages modelsand systems We received a wide variety of submissions each of which was reviewed by at least three referees Referees were chosen for each submission by an initial bidding process where Program Committee members chose papers from their area of interest The range of expertise represented by the large Program C mittee meant that almost all submissions were reviewed by subject experts on the Program Committee or by colleagues chosen by members of the Program Committee for their particular expertise Papers weresolicitedeither as long 15 page or short 8 page submissions Short paper submissions were refereed to exactly the same high standards as long paper submissions but naturally were expected to contain a smaller quantity of new material Thus there is no disti tion in these proceedings between short and long papers I used the excellent EasyChair conference management system to support this process of reviewing and for the collation and organization of these proceedings Submissions were made either to the applications track or to the research track Therewere101 23short researchtracksubmissionsofwhich36 8short wereaccepted whichisa36% 35%ofshort acceptancerate Applicationstrack submissions received special consideration and the acceptance rate was sign cantly higher than for the research track

Principles and Practice of Constraint Programming Helmut Simonis,2020-09-06 This book constitutes the proceedings of the 26th International Conference on Principles and Practice of Constraint Programming CP 2020 held in Louvain la Neuve Belgium in September 2020 The conference was held virtually due to the COVID 19 pandemic The 55 full papers presented in this volume were carefully reviewed and selected from 122 submissions They deal with all aspects of computing with constraints including theory algorithms environments languages models systems and applications such as decision making resource allocation scheduling configuration and planning The papers were organized according to the following topics tracks technical track application track and CP and data science and machine learning Principles and Practice of Constraint Programming - CP98 Michael Maher,Jean-Francois Puget,2003-05-20 Constraints have emerged as the basis of a representational and computational paradigm that draws from many disciplines and can be brought to bear on many problem domains This volume contains papers dealing with all aspects of c puting with constraints In particular there are several papers on applications of constraints re ecting the practical usefulness of constraint programming The papers were presented at the 1998 International Conference on Principles and Practice of Constraint Programming CP 98 held in Pisa Italy 26 30 tober 1998 It is the fourth in this series of conferences following conferences in Cassis France Cambridge USA and Schloss Hagenberg Austria We received 115 high quality submissions In addition 7 abstracts submissions were not followed by a full paper hence were not counted as submissions The program committee selected 29 high quality papers after thorough refereeing by at least 3 experts and further discussion by committee members We thank the referees and the

program committee for the time and e ort spent in reviewing the papers The program committee invited three speakers Joxan Ja ar Peter Jeavons Patrick Prosser Their papers are in this volume **Principles and Practice of Constraint Programming** Alan H. Borning,Alan Borning,1994-10-12 This volume is the proceedings of the Second International Workshop on the Principles and Practice of Constraint Programming held at Rosario Orcas Island Washington USA in May 1994 in cooperation with AAAI and ALP The volume contains 27 full revised papers selected from 87 submissions as well as a summary of a panel session on commercial applications of constraint programming The contributions cover a broad range of topics including constraint programming languages algorithms for constraint satisfaction and entailment and constraints and their relation to fields such as artificial intelligence databases operations research problem solving and user interfaces

Principles and Practice of Constraint Programming - CP 2007 Christian Bessiere,2007-09-06 This book constitutes the refereed proceedings of the 13th International Conference on Principles and Practice of Constraint Programming CP 2007 It contains 51 revised full papers and 14 revised short papers presented together with eight application papers and the abstracts of two invited lectures All current issues of computing with constraints are addressed ranging from methodological and foundational aspects to solving real world problems in various application fields **Principles and Practice of Constraint Programming - CP 2000** Rina Dechter,2000-09-06 This volume constitutes the refereed proceedings of the 6th International Conference on Principles and Practice of Constraint Programming CP 2000 held in Singapore in September 2000 The 31 revised full papers and 13 posters presented together with three invited contributions were carefully reviewed and selected from 101 submissions All current issues of constraint processing ranging from theoretical and foundational issues to applications in various fields are addressed *Principles and Practice of Constraint Programming* Thomas Schiex,Simon de Givry,2019-09-23 This book constitutes the proceedings of the 25th International Conference on Principles and Practice of Constraint Programming CP 2019 held in Stamford CT USA France in September October 2019 The 44 full papers presented in this volume were carefully reviewed and selected from 118 submissions They deal with all aspects of computing with constraints including theory algorithms environments languages models systems and applications such as decision making resource allocation scheduling configuration and planning The papers were organized according to the following topics tracks technical track application track multi agent and parallel CP track testing and verification track CP and data science track computational sustainability and CP and life sciences track Principles and Practice of Constraint Programming -- CP 2011 Jimmy Lee,2011-09-02 This book constitutes the refereed proceedings of the 17th International Conference on Principles and Practice of Constraint Programming CP 2011 held in Perugia Italy September 12 16 2011 The 51 revised full papers and 7 short papers presented together with three invited talks were carefully reviewed and selected from 159 submissions The papers are organized in topical sections on algorithms environments languages models and systems applications such as decision making resource allocation and agreement technologies

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