Conference Programme


Cork, Ireland

Western Gateway Building
University College Cork, Ireland
August 31st – September 5th, 2015
Welcome to the 2015 Co-location of CP and ICLP 2015

We warmly welcome you to Cork, and to the campus of University College Cork in particular. In 2015 University College Cork (UCC) celebrates the bicentenary of the birth of George Boole, 1815-64. Born in Lincoln, Boole was a mathematical genius who was largely self-taught. His appointment as the first Professor of Mathematics at this college in 1849 provided the opportunity to develop his most important work, “An Investigation of the Laws of Thought”.

To mark the occasion, a number of international conferences have been taking place in Cork this year. The George Boole Mathematical Sciences (GBMS) Conference took place from August 17-28, 2015. The George Boole Bicentenary Celebration 2015 was held over the weekend of August 28th 2015. The two largest international conferences in the programme are the 21st International Conference on the Principles and Practice of Constraint Programming (CP 2015) and the 31st International Conference on Logic Programming (ICLP 2015). CP and ICLP were co-located twice in the past: in 2001 in Paphos, Cyprus, and again in 2005 in Sitges, Spain. We hope you enjoy the conferences and benefit from their co-location, and that you take the opportunity to visit the Cork and the many treats it has to offer.

We would like to sincerely thank those who assisted us in organising this conference. Roland Yap was General co-Chair of ICLP with Barry O’Sullivan and provided much sound advice. On the local organisation side, we would like to thank Kathy Bunney, Peter MacHale, Catherine Maguire, Eleanor O’Riordan, Linda O’Sullivan, Joe Scanlon, Nicola Stathers, and Caitriona Walsh. Without their assistance the conference would not have been a success. We gratefully acknowledge our sponsors whose support made the conferences a viable proposition, and list these below. We also thank Thomas Eiter and Francesca Toni, Program Chairs of ICLP, and Gilles Pesant, Program Chair of CP, for putting together an excellent programme with the support of the various chairs and committees they recruited. Finally, we would like to thank the Association for Constraint Programming and the Association for Logic Programming for entrusting their conferences to us this year.

We believe the co-location of CP and ICLP will provide an exciting and thought-provoking forum for the presentation and debate of leading-edge research in the fields of constraint programming and logic programming, providing a fitting tribute to the legacy of Professor George Boole.

Ken Brown and Barry O’Sullivan
University College Cork, September 2015

Sponsors
George Boole, (born November 2, 1815, Lincoln, Lincolnshire, England – died December 8, 1864, Ballintemple, County Cork, Ireland), English mathematician who helped establish modern symbolic logic and whose algebra of logic, now called Boolean algebra, is basic to the design of digital computer circuits.

Boole was given his first lessons in mathematics by his father, a tradesman, who also taught him to make optical instruments. Aside from his father’s help and a few years at local schools, however, Boole was self-taught in mathematics. When his father’s business declined, George had to work to support the family. From the age of 16 he taught in village schools in the West Riding of Yorkshire, and he opened his own school in Lincoln when he was 20. During scant leisure time he read mathematics journals in the Lincoln’s Mechanics Institute. There he also read Isaac Newton’s Principia, Pierre-Simon Laplace’s Traité de mécanique céleste, and Joseph-Louis Lagrange’s Mécanique analytique and began to solve advanced problems in algebra.

Boole submitted a stream of original papers to the new Cambridge Mathematical Journal, beginning

\(^1\text{http://www.britannica.com/EBchecked/topic/73612/George-Boole\)
in 1839 with his *Researches on the Theory of Analytical Transformations*. These papers were on differential equations and the algebraic problem of linear transformation, emphasizing the concept of invariance. In 1844, in an important paper in the Philosophical Transactions of the Royal Society for which he was awarded the Royal Society’s first gold medal for mathematics, he discussed how methods of algebra and calculus might be combined. Boole soon saw that his algebra could also be applied in logic.

Developing novel ideas on logical method and confident in the symbolic reasoning he had derived from his mathematical investigations, he published in 1847 a pamphlet, *Mathematical Analysis of Logic*, in which he argued persuasively that logic should be allied with mathematics, not philosophy. He won the admiration of the English logician Augustus De Morgan, who published *Formal Logic* the same year. On the basis of his publications, Boole in 1849 was appointed professor of mathematics at Queen’s College, County Cork, Ireland – now University College Cork – even though he had no university degree. In 1854 he published *An Investigation into the Laws of Thought, on Which Are Founded the Mathematical Theories of Logic and Probabilities*, which he regarded as a mature statement of his ideas. The next year he married Mary Everest, niece of Sir George Everest, for whom the mountain is named. The Booles had five daughters.

One of the first Englishmen to write on logic, Boole pointed out the analogy between algebraic symbols and those that can represent logical forms and syllogisms, showing how the symbols of quantity can be separated from those of operation. With Boole in 1847 and 1854 began the algebra of logic, or what is now called Boolean algebra. Boole’s original and remarkable general symbolic method of logical inference, fully stated in *The Laws of Thought* (1854), enables one, given any propositions involving any number of terms, to draw conclusions that are logically contained in the premises. He also attempted a general method in probabilities, which would make it possible from the given probabilities of any system of events to determine the consequent probability of any other event logically connected with the given events.

In 1857 Boole was elected a fellow of the Royal Society. The influential *Treatise on Differential Equations* appeared in 1859 and was followed the next year by its sequel, *Treatise on the Calculus of Finite Differences*. Used as textbooks for many years, these works embody an elaboration of Boole’s more important discoveries. Boole’s abstruse reasoning has led to applications of which he never dreamed: for example, telephone switching and electronic computers use binary digits and logical elements that rely on Boolean logic for their design and operation.

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2 [http://www.ucc.ie](http://www.ucc.ie)
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1 Invited Talks

1.1 Joint Invited Talk – Sponsored by ECCAI

Industrial Success Stories of ASP and CP: What’s still open?

Gerhard Friedrich, Institute of Applied Informatics, Universität Klagenfurt, Austria
http://www.gerhard-friedrich.at/

Tuesday, 09:00, 1st September, G.05.

More than 25 years ago together with Siemens we started to investigate the possibility of substituting the classical rule-based configuration approach by model-based techniques. It turned out that in those days only constrained programming (CP) had any real chance of meeting the application demands. By exploiting CP we were able to significantly improve the productivity of highly trained employees (by more than 300%) and to substantially reduce software development and maintenance costs (by more than 80%). Consequently, CP has been our method of choice for problem solving in industrial projects since 1989.

Some years ago, we started to investigate answer set programming (ASP) techniques, mainly because of the possibility to apply a very expressive logical first-order language for specifying problems. It emerged that, by using simply problem encoding, we were able to solve difficult real world problem instances witnessing the enormous improvements of logic programming over the last decades.

Although ASP and CP have proven their practical applicability, we will point out challenges of large problems of the electronic and the semiconductor industry. In particular, we will stress the power of problem-specific heuristics which turned out to be the key in many applications of problem solvers.

Looking at the famous equation “algorithm = logic + control” most of the current work in the AI community assumes that control should be problem-independent and only the logical specification depends on the problem to be solved, i.e. “algorithm = logic(problem) + control”. It is not surprising that for the current problem solving technology this is a practical approach up to a certain size of the problem instances, since we deal with NP-hard problems in many cases. However, it is observed (and examples are given) that problem-specific heuristics allow enormous run-time improvements. This success is based on problem-specific control, i.e. “algorithm = logic(problem) + control(problem)”. Unfortunately, the design of such problem-specific heuristics is very time-consuming and redesigns are frequently required because of recurrent changes of the problem. Interestingly, humans are very successful at developing such problem-specific heuristics. Therefore, we argue that the automation of generating problem-specific heuristics with satisfying quality is still an important basic AI research goal with high practical impact that should be achievable.

This invited talk is sponsored by the European Coordinating Committee for Artificial Intelligence (ECCAI).
1.2 CP Invited Talks

Synthesis of Constraint Solvers

Douglas Smith, Kestrel Institute, USA
http://www.kestrel.edu/home/people/smith/

Wednesday, 09:00, 2nd September, G.05.

In [2], we present a mathematical framework for specifying and formally designing high-performance constraint solving algorithms. The framework is based on concepts from abstract interpretation which generalizes earlier work on a Galois Connection-based model of Global Search algorithms. The main focus is on how to use the framework to automate the calculations necessary to construct correct, efficient problem-specific constraint solvers.

It is common practice in the constraint-solving community to solve a new problem P by building a reduction to a well-studied problem Q that has a well-engineered solver. One problem with this approach is that the reduction of P to Q often loses some key structure which cannot then be exploited by the Q-solver. Our thesis is that a native solver can always be generated for a constraint problem that outperforms a reduction to an existing solver.

This talk focuses on three main results from [2]:

1. Algorithm theory – We develop and prove an algorithm theory for constraint solving with propagation, conflict detection and analysis, backjumping, and learning that is parametric on the constraint logic.

2. Design Method for Constraint Propagation – We prove that Arc Consistency is a best-possible constraint propagation mechanism for arbitrary CSPs, and then showed how to calculate optimal code for propagation. From Arc Consistency formula schemes we calculate simple Definite Constraints that can be instantiated into the optimal Definite Constraint Solver scheme [1].

3. Theory of Conflict Analysis – There are several mathematical formalisms for generalizing conflict analysis to arbitrary logics. We present a general pattern for calculating resolution rules in a given logic, and prove how resolution can be iterated to soundly infer a new constraint for backjumping and learning purposes.


Constraint-based Problems and Solutions in the Global Enterprise

Claire Bagley, Oracle, USA
https://www.linkedin.com/in/clbagley

Thursday, 09:00, 3rd September, G.05.

Oracle is a large global technology organization, whose product offerings have grown organically and through the acquisition of first class companies. Its leadership has expanded to the entire technology stack, to span the full range of computer hardware, operating systems, programming languages, databases, enterprise software, collaboration management tools, and into the cloud.
With thousands of products and tools running the full imaginable breadth and depth of a technology stack, it is then not surprising that Oracle is exposed to a vast number of complex combinatorial problems, as well as the different types of technology to solve them. Indeed, many of the classical applications and variations of constraint problems are represented: planning, scheduling, rostering, vehicle routing, configuration, networking, grid optimization, logistics, analytics, and cloud management. As expected with the development of products and the acquisition of companies operating in these domains, a large number of technologies come into play including Constraint Programming (CP), Mathematical Programming (MP), local search, heuristics, knowledge-based reasoning, genetic algorithms, machine learning, and many more.

The Advanced Constraint Technology (ACT) group at Oracle is tasked with identifying, understanding and solving the complex combinatorial problems that arise in a diverse field of application environments. Our expertise and industry proven ACT products are available to assist Oracle development teams on how to best model and solve their problems using CP, MP, Heuristics, and Hybrid solutions.

In this talk we examine some of the successful solutions to constrained problems within such a large corporation. We discuss at a high level the many opportunities for further integration and unification of constraint technologies into more products and tools, including the challenge of modeling and solving in highly interactive scenarios. Most importantly, we open the discussion about various challenges faced by large front-end centered companies, with many degrees of separation between organizations, who must balance resources to focus over immediate and long-term deliverables.

1.3 ICLP Invited Talks

Using and Developing Declarative Languages for Machine Learning and Data Mining

Luc De Raedt, Department of Computer Science, Katholieke Universiteit Leuven, Belgium

Wednesday, 09:00, 2nd September, 1.07.

Following a general trend in artificial intelligence, the fields machine learning and data mining have recently witnessed a growing interest in the use of declarative techniques. What is essential in this paradigm is that the user be provided with a way to declaratively specify what the problem is rather than having to outline how that solution needs to be computed. This corresponds to a model + solver-based approach in which the user specifies the problem in a high level modelling language and the system automatically transforms such models into a format that can be used by a solver to efficiently generate a solution. This should be much easier for the user than having to implement or adapt an algorithm that computes a particular solution to a specific problem. Therefore, declarative methods could have a radical impact on the fields of machine learning and data mining.

In this talk, I shall report on this new trend in machine learning and data mining from two different perspectives. The first is that of a user of existing declarative methods such as constraint programming and answer set programming, where I shall report on experiences, successes and challenges with using this type of technology. The second is that of a developer of declarative languages and solvers for machine learning and data mining, where I shall provide a gentle introduction to different types of languages such as inductive query languages, which extend database query languages with primitives for mining and learning, modelling languages for constraint-based mining, and probabilistic and other programming languages that support machine learning.
The Semantic Web aims at making information available in a form that is understandable and automatically manageable by machines. Ontologies are engineering artifacts used to this purpose, and Description Logics (DLs) are a family of logic-based languages particularly suitable for modeling (and reasoning upon) ontologies and the Semantic Web. Great effort has been spent in identifying decidable or even tractable DLs. Efficient DLs reasoners have been implemented in procedural, object-oriented languages or Prolog.

Nonetheless, incompleteness or uncertainty is intrinsic of much information on the World Wide Web. This motivated the research in Probabilistic DLs, some of which derived from approaches from the Logic Programming area. Conversely, for knowledge representation and reasoning, integration with rules and rule-based reasoning is also crucial in the so-called Semantic Web stack vision.

In this talk, I will focus on probabilistic DLs. First, I will briefly overview DLs and reasoning systems. After recalling the Distribution Semantics from Probabilistic Logic Programming, I will show how it and other probabilistic approaches have been applied to DLs, and what inference systems for Probabilistic DLs are available. Learning Probabilistic DL theories is also an interesting issue. A demo of a Web-based system for Probabilistic DLs implemented in SWI Prolog, and SWISH, will conclude this part of the talk.

A further research activity has been conducted by the AI and LP community in order to facilitate the integration of DL theories with rules and rule-based reasoning, since this is also crucial in the Semantic Web. Proposals like Datalog+- and its extensions, ASP-based systems or Abductive Logic Programming for modeling and reasoning upon ontologies, are significant attempts which should be considered seriously by the LP community. I will briefly mention these approaches, ending the talk.

2 Tutorials

2.1 CP Tutorials

Towards embedded Answer Set Solving

Torsten Schaub, University of Potsdam, Germany
http://www.cs.uni-potsdam.de/~torsten/

Tuesday, 13:45, 1st September, G.03.

Answer Set Programming (ASP) offers a declarative tool for modeling and solving combinatorial (optimization) problems, while being tailored to knowledge representation and reasoning tasks. Its appealing combination of declarativeness and performance allows for concentrating on an actual problem, rather than a smart way of implementing it. So far, however, ASP was mainly used as a one-shot solving formalism, dealing with one problem at a time. On the other hand, in practice, ASP constitutes an under-the-hood technology that is usually embedded in a larger encompassing software system. This brings about the need to interact with an environment and to deal with its dynamics.
This tutorial has its focus on putting ASP at work. This comprises a good understanding of ASP’s solving technology as well as basic skills in ASP’s modeling capacities. In view of ASP’s growing dissemination, we focus on the usage of ASP for modeling complex reasoning scenarios. This involves an introduction to the API of CLINGO 4, an ASP system with control capacities expressible in Python. We illustrate this by modeling the round-based board game Ricochet Robots and show how it was used in ASPRIN, a system for optimizing combinations of qualitative and quantitative preferences.

**Lagrangian Relaxation for Domain Filtering**

Hadrien Cambazard, G-SCOP - Grenoble Institute of Technology - School of Industrial Engineering, Grenoble, France

http://pagesperso.g-scop.grenoble-inp.fr/~cambazah/

Wednesday, 13:45, 2nd September, G.03.

Lagrangian relaxation (LR) is a very important technique in operations research to reformulate and solve an integer linear program. From a Constraint Programming (CP) point of view, it offers a very simple and powerful framework to perform cost-based filtering. The goal of the present tutorial is to explain Lagrangian relaxation and how it can be embedded as a filtering mechanism in constraint solvers.

This tutorial is designed for a Constraint Programming audience without any background in Lagrangian relaxation. Firstly, we will focus on explaining Lagrangian duality and the resolution of the Lagrangian dual with the most popular algorithms. Secondly, we will discuss cost-based filtering in the Lagrangian framework and illustrate the relationship to linear programming reduced-cost based filtering. Many ideas will be illustrated on the Multi-cost-regular and AtMostNValue global constraints. Finally we will review and discuss the current use of LR by the CP community.

**XCSP3**

Frederic Boussemart, Christophe Lecoutre and Cedric Piette

http://www.cril.univ-artois.fr/

Thursday, 13:45, 3rd September, G.01.

In this tutorial, we shall present a major revision of the format XCSP 2.1, called XCSP3, to build integrated representations of combinatorial constrained problems. This new format is able to deal with mono/multi optimization, many types of variables, cost functions, reification, views, annotations, variable quantification, distributed, probabilistic and qualitative reasoning. The new format is made compact, highly readable, and rather easy to parse. Interestingly, it partly captures the structure of the problem models, through the possibilities of declaring arrays of variables, and identifying syntactic and semantic groups of constraints. The number of constraints is kept under control by introducing a set of approximately 50 basic constraint forms, and producing almost automatically some of their variations through lifting, restriction, sliding, logical combination and relaxation mechanisms. As a result, XCSP3 encompasses practically all constraints that can be found in major constraint solvers developed by the CP community. We shall also present our website, developed conjointly with the format, which contains many series of XCSP3 problem instances coupled with a system of queries that allows selecting instances from very precise criteria. It also provides a package of tools for parsing and checking XCSP3 instances. The objective of XCSP3 is to ease the effort required to test and compare different algorithms by providing a common test-bed of combinatorial constrained instances.
Constraints and Bioinformatics: results and challenges

Agostino Dovier, University of Udine, Italy
https://users.dimi.uniud.it/~agostino.dovier/

Friday, 13:45, 4th September, G.01.

Biology is a source of challenging problems for the entire field of Computer Science in general, and for the areas of computational logic and constraint programming, in particular. Successful approaches to these problems are likely to have significant applications in several fields of research, such as medicine, agriculture, industry, etc.

In this tutorial a brief overview of Bioinformatics will be presented. According to Crick’s central dogma, information flow from DNA sequences to RNA sequences (transcription) and from RNA to Protein (translation). Informatics is called into play for modeling/analyzing various parts of this scheme. Genomics studies (eg problems associated to Haplotype/Phylogenetic inference and inference), Structural studies (eg problems associated to RNA secondary structure prediction and Protein structure prediction) and, finally, Systems studies (problems associated to reasoning with biological networks) will be introduced. The relevant approaches based on constraint programming (and affine techniques, such as SAT, ASP) to some of these problems will be discussed. Most of these results have been presented in issues of the workshop on constraint based methods for Bioinformatics and related publications (see, e.g., http://clp.dimi.uniud.it/wcb/). However, these approaches are not yet the definitive solution to all problems, and participants can address some points where their experience can make the difference...

2.2 ICLP 2015 Invited Tutorials

A brief guided tour along the borders of Logic Programming with Description Logics

Francesca Lisi, Universitá degli Studi di Bari “Aldo Moro”, Italy
http://www.di.uniba.it/~lisi/

Tuesday, 17:15, 1st September, G.05.

Logic Programming (LP) and the family of Description Logics (DLs) are both based on fragments of First Order Logic (FOL). However, they are characterized by very different semantic assumptions. Yet, a partial overlap exists between LP and DLs which allows the extension and/or adaptation of known results in LP to DLs and viceversa. Even more interestingly, a combination of the two is possible via several integration schemes that are aimed at designing very expressive FOL languages and ultimately overcoming the aforementioned semantic mismatch between LP and DLs. Several works in Inductive Logic Programming (ILP) testify the great potential of these hybrid knowledge representation formalisms also from the perspective of machine learning and inductive reasoning.

In this tutorial talk I will survey the literature of the last 20 years concerning the combination of (I)LP and DLs with a particular emphasis on the integration issues. We will see how many interesting things happen or could happen along the borders of LP with DLs. I hope you will enjoy the brief guided tour!
Abstract Solvers for Answer Set Programming

Marco Maratea, Università degli Studi di Genova, Italy
http://www.star.dist.unige.it/~marco/

Wednesday, 17:15, 2nd September, G.05.

Abstract solvers are a recently employed method to formally describe, compare and combine solving algorithms, where the states of computation are represented as nodes of a graph, the solving techniques as edges between such nodes, the solving process as a path in the graph and the formal properties of the algorithms are reduced to related graph properties.

In this tutorial I overview the application of abstract solvers in Answer Set Programming (ASP). After an introduction devoted to an abstract solver for SAT solving, I show abstract solvers for ASP procedures for non-disjunctive programs; then, by building on the resulting graphs, I move to ASP procedures for disjunctive programs. Next, abstract solvers for cautious reasoning are presented. Finally, I briefly touch the usage of abstract solvers in other research fields, such as Quantified SAT, Constraint ASP and Abstract Argumentation Frameworks.

Datalog+/-: A New Family of Languages for Knowledge Representation and Reasoning

Thomas Lukasiewicz, Department of Computer Science, University of Oxford, UK
http://www.cs.ox.ac.uk/thomas.lukasiewicz/

Thursday, 17:15, 3rd September, G.05.

Datalog+/- is a recently introduced family of expressive extensions of Datalog for knowledge representation and reasoning. In particular, Datalog+/- allows for representing ontological axioms and for query answering under such axioms. The Datalog+/- languages are derived from Datalog by allowing existentially quantified variables, equality, and the falsum in rule heads, and, at the same time, by enforcing suitable restrictions to achieve decidability and tractability. I will give a general overview of the Datalog+/- family of languages, including complexity results for query answering, main application areas, as well as extensions for handling inconsistencies, probabilistic uncertainty, and preferences.

Tutorial on analysis and verification of imperative programs through CLP

John Gallagher, Roskilde University, Denmark and IMDEA Software Institute, Spain
http://akira.ruc.dk/~jpg/

Friday, 09:00, 4th September, G.05.

In this tutorial we show how constraint logic programs (CLP) provide a flexible framework for analysis and verification of other languages. Here the focus is on analysing imperative programming languages. It is first necessary to translate a given imperative program into CLP clauses. Different approaches to automatic translation based on small-step or big-step semantics will be shown, along with their advantages and disadvantages. The role of query-answer transforms in the translation process is also presented. The problem of analysing or verifying properties of an imperative program is thus translated into a CLP analysis or verification problem. The main CLP analysis technique covered in this tutorial is the computation of approximate models of CLP clauses using abstract interpretation over numeric or symbolic abstract domains. The tutorial contains a survey of analysis and verification problems for imperative programs that have been successfully tackled in this way, including verification of safety properties in sequential and concurrent programs, termination, resource analysis and shape analysis.
3 Workshops, Doctoral Consortia, & Competition

3.1 CP Workshops

09:00 – 17:30  Fourteenth International Workshop on Constraint Modelling & Reformulation (ModRef 2015)
09:00 – 17:30  Fifth International Workshop on the Cross-Fertilization Between CSP and SAT (CSPSAT 2015)
09:00 – 12:00  Workshop on Constraint Based Methods in Bioinformatics (WCB 2015) (shared with ICLP)
09:00 – 12:00  Sixth International Workshop on Bin Packing and Placement Constraints (BPPC’15)
13:30 – 17:30  Workshop on Teaching Constraint Programming

3.2 ICLP Workshops

09:00 – 17:30  Workshop on Probabilistic Logic Programming (PLP 2015)
09:00 – 17:30  Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2015)
09:00 – 12:00  International Workshop on Argumentation and Logic Programming (ArgLP 2015)
09:00 – 12:00  Constraint Based Methods in Bioinformatics (WCB 2015) (shared with CP)

3.3 Doctoral Consortia and Industrial Modelling Competition

09:00 – 17:30  ICLP Doctoral Consortium
09:00 – 17:30  CP Doctoral Programme
17:30-18:00  Industrial Modelling Competition Kick-off
4 Main Conference Programme

4.1 Tuesday 1st, September 2015

08:45 - Welcome ................................................................. G.05

Session Chairs: Ken Brown and Barry O’Sullivan

09:00 - Plenary 1: Invited Talk ............................................. G.05

Session chair: Thomas Eiter

Industrial Success Stories of ASP and CP: What’s still open?
Gerhard Friedrich, Institute of Applied Informatics, Universität Klagenfurt, Austria.

This invited talk is sponsored by the European Coordinating Committee for Artificial Intelligence (ECCAI).

10:00 - Break

10:30 - Plenary 2: Award Winning Papers ............................... G.05

Session Chairs: Gilles Pesant and Francesca Toni

- CP Best Technical Paper
  Projection, Consistency, and George Boole
  John Hooker

- CP Best Student Paper
  On computing Minimal Independent Support and its applications to sampling and counting
  Alexander Ivrii, Sharad Malik, Kuldeep S. Meel and Moshe Vardi

- ICLP Best Technical Paper
  Complexity and Compilation of GZ-Aggregates in Answer Set Programming
  Mario Alviano and Nicola Leone

12:00 - Lunch

13:45 - CP Session 1: Complexity ........................................... G.01

Session chair: François Fages

- Broken Triangles Revisited
  Martin Cooper, Aymeric Duchein and Guillaume Escamocher

- Upper and Lower Bounds on the Time Complexity of Infinite-domain CSPs
  Peter Jonsson and Victor Lagerkvist
• Pseudopolynomial simulation of DNNF by a Non-deterministic read-once branching program
Igor Razgon

13:45 - CP Tutorial 1 ................................................................. G.03

Session chair: Willem-Jan Van Hoeve

Towards embedded Answer Set Solving
Torsten Schaub, University of Potsdam, Germany

13:45 - ICLP Session 1: Program Analysis & CLP ................................. G.05

Session chair: Agostino Dovier

• Proving Correctness of Imperative Programs by Linearizing Constrained Horn Clauses
Emanuele De Angelis, Fabio Fioravanti, Alberto Pettorossi and Maurizio Proietti

• Horn Clauses as an Intermediate Representation for Program Analysis and Transformation
Graeme Gange, Jorge A Navas, Peter Schachte, Harald Sondergaard and Peter J. Stuckey

• Adding Partial Functions to Constraint Logic Programming with Sets
Maximiliano Cristià, Gianfranco Rossi and Claudia Frydman

15:00 - Break

15:30 - CP Session 2: Inference & Learning ........................................ G.01

Session chair: Michela Milano

• Exact Sampling for Regular and Markov constraints with Belief Propagation
Alexandre Papadopoulos, Francois Pachet, Pierre Roy and Jason Sakellariou

• Machine learning of Bayesian networks using constraint programming
Peter van Beek and Hella-Franziska Hoffmann

• Revisiting the Limits of MAP Inference by MWSS on Perfect Graphs
Adrian Weller

• Smallest MUS Extraction with Minimal Hitting Set Dualization
Alexey Ignatiev, Alessandro Previti, Mark Liffiton and Joao Marques-Silva

15:30 - CP Session 3: Applications .................................................... G.03

Session chair: Pierre Schaus

• Joint Vehicle and Crew Routing and Scheduling
Edward Lam, Pascal Van Hentenryck and Philip Kilby
- Modeling Universal Instruction Selection
  Gabriel Hjort Blindell, Roberto Castañeda Lozano, Mats Carlsson and Christian Schulte

- Constructing Sailing Match Race Schedules: Round-Robin Pairing Lists
  Craig Macdonald, Ciaran McCreesh, Alice Miller and Patrick Prosser

- Open Packing for Facade-Layout Synthesis Under a General Purpose Solver
  Andrés Felipe Barco Santa, Jean-Guillaume Fages, Elise Vareilles, Michel Aldanondo and Paul Gaborit

15:30 - ICLP Session 2: The Future Publication of ICLP Proceedings ............... G.05

Session chair: Torsten Schaub

17:15 - ICLP Invited Tutorial 1 ............................................................... G.05

Session chair: Evelina Lamma

A brief guided tour along the borders of Logic Programming with Description Logics
Francesca Lisi, Dipartimento di Informatica and Centro Interdipartimentale di Logica e Applicazioni, Università degli Studi di Bari “Aldo Moro”, Italy

17:15 - ACP General Assembly ............................................................... G.03

18:30-20:00 - Welcome Reception ......................................................... Aula Maxima

Welcome: Dr. Michael Murphy, President, University College Cork.

Boole Talk: Professor Des MacHale, Emeritus, Mathematics, University College Cork.
4.2 Wednesday 10th, September 2015

09:00 - CP Invited Talk 1 ................................................................. G.05

Session chair: Christian Schulte

Synthesis of Constraint Solvers
Douglas Smith, Kestrel Institute, USA.

09:00 - ICLP Invited Talk 2 ............................................................. 1.07

Session chair: Barry O’Sullivan

Using and Developing Declarative Languages for Machine Learning and Data Mining
Luc De Raedt, Department of Computer Science, Katholieke Universiteit Leuven, Belgium.

10:00 - Break

10:30 - CP Session 4: ACP Research Excellence & Doctoral Research Awards .......... G.05

10:30 - ICLP Session 3: Technical Communications ................................. 1.07

Session chair: Joohyung Lee (and Marina De Vos for the best ICLP Doctoral Consortium contribution)

- Parallel Bottom-Up Evaluation of Logic Programs: DeALS on Shared-Memory Multicore Machines
  Mohan Yang, Alexander Shkapsky and Carlo Zaniolo

- Grid Mind: Prolog-Based Simulation Environment for Future Energy Grids
  Jan Rosecky, Filip Prochazka and Barbora Buhnova

- On Type-directed Generation of Lambda Terms
  Paul Tarau

- Answer Set Application Programming: a Case Study on Tetris
  Peter Schüller and Antonius Weinzierl

- Soundness of Coinduction via Structural Resolution
  Patricia Johann and Ekaterina Komendantskaya

- Debugging ASP using ILP
  Tingting Li, Marina De Vos, Julian Padget, Ken Satoh and Tina Balke

- Learning Probabilistic Action Models from Interpretation Transitions
  David Martínez, Tony Ribeiro, Katsumi Inoue, Guillem Aleny‡ and Carme Torras

- Logic Programming for Cellular Automata
  Marcus Völker and Katsumi Inoue

- Relating Concrete Argumentation Formalisms and Abstract Argumentation
  Michael Maher
• CHR Exhaustive Execution - Revisited
  Ahmed Elsawy, Amira Zaki and Slim Abdennadher

• A logical approach to working with biological databases
  Nicos Angelopoulos and Georgios Giamas

• An abductive framework for Datalog+-/- ontologies
  Marco Gavanelli, Evelina Lamma, Fabrizio Riguzzi, Elena Bellodi, Riccardo Zese and Giuseppe Cota

• Formal Methods for Answer Set Programming (best ICLP Doctoral Consortium contribution)
  Amelia Harrison

12:10 Lunch (ICLP Poster Session; ALP-EC Meeting)

13:45 - CP Session 5: Alternative & Hybrid Solvers ................................. G.01

Session chair: Pedro Barahona

• Representing and Solving Finite-Domain Constraint Problems using Systems of Polynomials
  Christopher Jefferson, Peter Jeavons, Martin J. Green and M. R. C. van Dongen

• Hybridization of Interval CP and Evolutionary Algorithms for Optimizing Difficult Problems
  Charlie Vanaret, Jean-Baptiste Gotteland, Nicolas Durand and Jean-Marc Alliot

• A Hybrid Approach Combining Local Search and Constraint Programming for a Large Scale Energy Management Problem
  Haris Gavranovic and Mirsad Buljubasic

13:45 - CP Tutorial 2 ................................................................. G.03

Session chair: David Bergman

Lagrangian Relaxation for Domain Filtering
Hadrien Cambazard, G-SCOP - Grenoble Institute of Technology - School of Industrial Engineering, Grenoble, France.

13:45 - ICLP Session 4: Tabling & LP compilation ................................. G.05

Session chair: Maurizio Proietti

• Tabling as a Library with Delimited Control
  Benoit Desouter, Marko van Dooren and Tom Schrijvers

• Planning as Tabled Logic Programming
  Neng-Fa Zhou, Roman Bartak and Agostino Dovier

• Knowledge Compilation of Logic Programs Using Approximation Fixpoint Theory
  Bart Bogaerts and Guy Van den Broeck
15:00 - Break

15:30 - CP Session 6: Optimization ......................................................... G.01

Session chair: Peter Stuckey

- Discrete Optimization with Decision Diagrams
  David Bergman, Andre Augusto Cire, Willem-Jan van Hoeve and John Hooker

- Strengthening Convex Relaxations with Bound Tightening for Power Network Optimization
  Carleton Coffrin, Hassan Hijazi and Pascal Van Hentenryck

- General bounding mechanism for Constraint Programs
  Minh Hoàng Hà, Claude-Guy Quimper and Louis-Martin Rousseau

- Improved Constraint Propagation via Lagrangian Decomposition
  David Bergman, Andre Cire and Willem-Jan Van Hoeve

15:30 - CP Session 7: Applications ......................................................... G.03

Session chair: Louis-Martin Rousseau

- Solving Segment Routing Problems with Constraint Programming Techniques
  Renaud Hartert, Pierre Schaus, Stefano Vissicchio and Olivier Bonaventure

- Design and Evaluation of a Constraint-based Energy Saving and Scheduling Recommender System
  Séan Óg Murphy, Oscar Manzano and Ken Brown

- Scheduling Running Modes of Satellite Instruments Using Constraint-Based Local Search
  Cédric Pralet, Solange Lemai-Chenevier and Jean Jaubert

- A Constraint-Based Approach for the Differential Harvest Problem
  Nicolas Briot, Christian Bessiere and Philippe Vismara

15:30 - ICLP Session 5: Evaluation ......................................................... G.05

Session chair: Francesco Ricca

- Abstract Gringo
  Martin Gebser, Amelia Harrison, Roland Kaminski, Vladimir Lifschitz and Torsten Schaub

- Rewriting recursive aggregates in answer set programming: back to monotonicity
  Mario Alviano, Wolfgang Faber and Martin Gebser

- Fuzzy Answer Set Computation via Satisfiability Modulo Theories
  Mario Alviano and Rafael Peñaloza

- An Infinitary Encoding of Temporal Equilibrium Logic
  Pedro Cabalar, Martín Diéguez and Concepcion Vidal
17:15 - ICLP Invited Tutorial 2 ......................................................... G.05

Session chair: Miroslaw Truszczynski

Abstract Solvers for Answer Set Programming
Marco Maratea, Universita’ degli Studi di Genova, Italy.

18:30 ALP Meeting ................................................................. G.05

19:45 LP/CP Programming Contest (until 21:45) ......................... G.08
4.3 Thursday 3rd, September 2015

09:00 - CP Invited Talk 2 ................................................................. G.05

Session chair: Helmut Simonis

Constraint-based Problems and Solutions in the Global Enterprise
Claire Bagley, Oracle, USA.

09:00 - ICLP Invited Talk 2 ................................................................. 1.07

Session chair: Roland Yap

(Probabilistic) Description Logics
Evelina Lamma, University of Ferrara, Italy.

10:00 - Break

10:30 - CP Session 8: Applications and Best Application Paper ....................... G.01

Session chair: Louis-Martin Rousseau

- Long-Haul Fleet Mix and Routing Optimisation with Constraint Programming and Large Neigh-
  bourhood Search
  Tommaso Urli and Philip Kilby
- A Constraint Programming Approach for Non-Preemptive Evacuation Scheduling
  Caroline Even, Andreas Schutt and Pascal Van Hentenryck
- Constraint-based Local Search for Finding Node Disjoint Paths in Optical Access Networks
  Alejandro Arbelaez, Deepak Mehta and Barry O’Sullivan
- Constraint programming for LNG ship scheduling and inventory management
  Willem-Jan van Hoeve

10:30 - CP Session 9: Randomness & Stochasticity ................................. G.03

Session chair: Lars Kotthoff

- Bounding an Optimal Search Path with a Game of Cop and Robber on graphs
  Frédéric Simard, Michael Morin, Claude-Guy Quimper, François Laviolette and Josée Deshar-
  nais
- General Game Playing with Stochastic CSP
  Frédéric Koriche, Sylvain Lagrue, Eric Piette and Sébastien Tabary
- Deterministic estimation of the expected makespan of a POS under duration uncertainty
  Michele Lombardi, Alessio Bonfietti and Michela Milano
- Randomness as a Constraint
  Steven Prestwich, Roberto Rossi and Armagan Tarim
10:30 - ICLP Session 5: Test of time awards: 1995, 2005 .............................. G.05

Session chair: Torsten Schaub

12:10 Lunch

13:45 - CP Session 10: Industrial Problem Modelling (progress report) ............ G.08

Session chair: Helmut Simonis

13:45 - CP Session 11: Consistency & Propagation ................................. G.03

Session chair: Christian Bessiere

- Restricted Path Consistency Revisited
  Kostas Stergiou

- MDD Propagation for Sequence Constraints
  David Bergman, Andre Augusto Cire and Willem-Jan van Hoeve

- The Unary Resource with Transition Times
  Cyrille Dejemeppe, Sascha Van Cauwelaert and Pierre Schaus

13:45 - CP Tutorial 3 ................................................................. G.01

Session chair: Pierre Flener

XCSP3
Frederic Boussemart, Christophe Lecoutre and Cedric Piette.

13:45 - ICLP Session 6: Foundations ............................................. G.05

Session chair: TBA

- Dual-normal Logic Programs - the Forgotten Class
  Johannes Klaus Fichte, Miroslaw Truszczyński and Stefan Woltran

- A Denotational Semantics for Equilibrium Logic
  Felicidad Aguado, Pedro Cabalar, David Pearce, Gilberto Pérez and Concepcion Vidal

- Semantics of templates in a compositional framework for building logics
  Ingmar Dasseville, Matthias van der Hallen, Marc Denecker and Gerda Janssens
15:00 - Break

15:30 - CP Session 11: Solution Showcase (poster session) ............................... Foyer

15:30 - CP Session 12: Search ................................................................. G.01

Session chair: Michel Rueher

- Visual Search Tree Profiling
  Maxim Shishmarev, Christopher Mears, Guido Tack and Maria Garcia De La Banda

- MiniSearch: a solver-independent meta-search language for MiniZinc
  Andrea Rendl, Tias Guns, Peter J. Stuckey and Guido Tack

- Anytime Hybrid Best-First Search with Tree Decomposition for Weighted CSP
  David Allouche, Simon de Givry, George Katsirelos, Thomas Schiex and Matthias Zytnicki

- Conflict-Ordering Search
  Steven Gay, Renaud Hartert, Christophe Lecoutre and Pierre Schaus

15:30 - CP Session 13: Modelling ......................................................... G.03

Session chair: John Hooker

- Automatically Generating Streamlined Constraint Models with Essence and Conjure
  James Wetter, Ozgur Akgun and Ian Miguel

- Automatically Improving SAT Encoding of Constraint Problems through Common Subexpression Elimination in Savile Row
  Peter Nightingale, Patrick Spracklen and Ian Miguel

- Automated Auxiliary Variable Elimination through On-the-Fly Propagator Generation
  Jean-Noël Monette, Pierre Flener and Justin Pearson

- On the Reification of Global Constraints
  Nicolas Beldiceanu, Mats Carlsson, Pierre Flener and Justin Pearson

15:30 - ICLP Invited Tutorial 3 ............................................................. G.05

Session chair: Laura Giordano

Datalog+/-: A New Family of Languages for Knowledge Representation and Reasoning
Thomas Lukasiewicz, Department of Computer Science, University of Oxford, UK.

16:30 - ICLP Session 7: Panel .............................................................. G.05

Session chair: Manuel Hermenegildo

Teaching Computer Science and Declarative Programming in Schools and Universities
Chaired by Manuel Hermenegildo.
18:00 Banquet

The conference banquet takes place in Ballymaloe – [http://www.ballymaloe.ie](http://www.ballymaloe.ie). Buses will be provided to take delegates to and from the venue. The first departure from the Western Gateway Building will be at 18:00. The first return bus from Ballymaloe will be at 21:30 with the last bus leaving at 23:00.

4.4 Friday 4th, September 2015

09:00 - CP Session 14: MiniZinc Challenge Results ............................................. G.01

09:10 - CP Session 15: Tractability ................................................................. G.03

Session chair: Gilles Pesant

- On Tree-Preserving Constraints
  Shufeng Kong, Sanjiang Li, Yongming Li and Zhiguo Long

- A Microstructure-based Family of Tractable Classes for CSPs
  Martin Cooper, Philippe Jégou and Cyril Terrioux

09:00 - ICLP Invited Tutorial 4 ................................................................. G.05

Session chair: Manuel Carro

Tutorial on analysis and verification of imperative programs through CLP
John Gallagher, Roskilde University, Denmark and IMDEA Software Institute, Spain.

10:00 - Break

10:30 - CP Session 16: Global Constraints .................................................... G.01

Session chair: Christian Bessiere

- Using Finite Transducers for Describing and Synthesising Structural Time-Series Constraints
  Nicolas Beldiceanu, Mats Carlsson, Remi Douence and Helmut Simonis

- PREFIX-PROJECTION Global Constraint for Sequential Pattern Mining
  Amina Kemmar, Samir Loudni, Lebbah Yahia, Patrice Boizumault and Thierry Charnois

- Achieving Domain Consistency and Counting Solutions for Dispersion Constraints
  Gilles Pesant

- A Global Constraint for a Tractable Class of Temporal Optimization Problems
  Alban Derrien, Jean-Guillaume Fages, Thierry Petit and Charles Prud’Homme
10:30 - CP Session 17: Boolean Satisfiability .............................................. G.03

Session chair: Steve Prestwich

- meSAT: Multiple Encodings of CSP to SAT
  Mirko Stojadinović and Filip Marić
- Smaller Selection Networks for Cardinality Constraints Encoding
  Michał Karpiński and Marek Piotrów
- Encoding Linear Constraints with Implication Chains to CNF
  Ignasi Abío, Valentin Mayer-Eichberger and Peter J. Stuckey
- Generalized Totalizer Encoding for Pseudo-Boolean Constraints
  Saurabh Joshi, Ruben Martins and Vasco Manquinho

10:30 - ICLP Session 8: Technical Communications ................................. G.05

Session chair: Marina De Vos

- Logic Programming and Bisimulation
  Agostino Dovier
- Expressing and Supporting Efficiently Greedy Algorithms as Locally Stratified Logic Programs
  Carlo Zaniolo
- Towards a Generic Interface to Integrate CLP and Tabled Execution
  Joaquin Arias Herrero and Manuel Carro
- Thread-Aware Logic Programming For Data-Driven Parallel Programs
  Flavio Cruz, Ricardo Rocha and Seth Goldstein
- Parallel Execution of the ASP Computation - an Investigation on GPUs
  Andrea Formisano, Flavio Vella, Agostino Dovier and Enrico Pontelli
- Stable Models of Markov Logic Networks
  Joohyung Lee, Yunsong Meng and Yi Wang
- Abstract Answer Set Solvers for Cautious Reasoning
  Remi Brochenin and Marco Maratea
- On Structural Analysis of Non-Ground Answer-Set Programs
  Benjamin Kiesl, Peter Schller and Hans Tompits
- Unifying Justifications and Debugging for Answer-Set Programs
  Joao Mura, Anastasia Analyti and Carlos Viegas Dam-sio
- Automated Reasoning about XACML 3.Delegation Using Answer Set Programming
  Joohyung Lee, Yi Wang and Yu Zhang
- A logic-based approach to understanding lone-actor terrorism
  Dalal Alrajeh and Paul Gill
12:10 Lunch (with ICLP posters – Foyer)

13:45 - CP Tutorial 4 ......................................................... G.01

Session chair: Pierre Flener

Constraints and Bioinformatics: results and challenges
Agostino Dovier, University of Udine, Italy.

13:45 - CP Session 18: Distributed and Parallel Computation ...................... G.03

Session chair: Patrick Prosser

- A General Framework for Reordering Agents Asynchronously in Distributed CSP
  Mohamed Wahbi, Younes Mechqrane, Christian Bessiere and Ken Brown

- Exploiting GPUs in Solving (Distributed) Constraint Optimization Problems with Dynamic Programming
  Ferdinando Fioretto, Tiep Le, Enrico Pontelli, William Yeoh and Tran Cao Son

- A Parallel, Backjumping Subgraph Isomorphism Algorithm using Supplemental Graphs
  Ciaran McCreesh and Patrick Prosser

13:45 - ICLP Session 9: LP and Program Execution ................................. G.05

Session chair: Alberto Pettorossi

- Concolic Testing in Logic Programming
  Fred Mesnard, Étienne Payet and German Vidal

- Practical Run-time Checking via Unobtrusive Property Caching
  Nataliia Stulova, Jose F. Morales and Manuel V. Hermenegildo

- A Logic Programming Approach to Predict Effective Compiler Settings for Embedded Software
  Craig Blackmore, Oliver Ray and Kerstin Eder

15:00 - Break

15:30 - CP Session 19: Scheduling ...................................................... G.01

Session chair: Nicolas Beldiceanu

- Modeling and Solving Project Scheduling with Calendars
  Stefan Kreter, Andreas Schutt and Peter J. Stuckey

- A Quadratic Extended Edge-Finding Filtering Algorithm for Cumulative Resource Constraints
  Roger Kameugne, Laure Pauline Fotso and Joseph D. Scott

- Simple and Scalable time-table filtering for the Cumulative Constraint
  Steven Gay, Renaud Hartert and Pierre Schaus
• Two Clause Learning Approaches for Disjunctive Scheduling
  Mohamed Siala, Christian Artigues and Emmanuel Hebrard

15:30 - CP Session 20: Applications  ......................................................... G.03

Session chair: Peter van Beek

• Optimizing the Cloud Service Experience using Constraint Programming
  Serdar Kadioglu, Michael Colena, Steven Huberman and Claire Bagley

• Find Your Way Back: Mobility Profile Mining with Constraints
  Lars Kotthoff, Mirco Nanni, Riccardo Guidotti and Barry O’Sullivan

• Constrained Minimum Sum of Squares Clustering by Constraint Programming
  Thi-Bich-Hanh Dao, Khanh-Chuong Duong and Christel Vrain

• Power Capping in High Performance Computing systems
  Andrea Borghesi, Michele Lombardi, Michela Milano and Luca Benini

15:30 - ICLP Session 10: Applications  ......................................................... G.05

Session chair: Alessandro dal Palu

• Improved Answer-Set Programming Encodings for Abstract Argumentation
  Sarah Alice Gaggl, Norbert Manthey, Alessandro Ronca, Johannes Peter Wallner and Stefan Woltran

• Optimizing Phylogenetic Supertrees using Answer Set Programming
  Laura Koponen, Emilia Oikarinen, Tomi Janhunen and Laura Säilä

• Taming Primary Key Violations to Query Large Inconsistent Data via ASP
  Marco Manna, Francesco Ricca and Giorgio Terracina

• Learning Weak Constraints in Answer Set Programming
  Mark Law, Alessandra Russo and Krysia Broda

4.5 Saturday 5th, September 2015

09:00 - CP Session 21: CSPLib Sprint  ......................................................... 2.26

18:00 - Close
5 Local Information

5.1 Wifi

There are two wifi options available. The Western Gateway Building provides access to Eduroam, which you can use if you have an Eduroam account. We also have accounts available for use with UCC Guest. In order to ensure good bandwidth to all delegates we have arranged a set of credentials. You are free to use any of these. Technical support is available should you require it.

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5.2 Emergencies, Late-Night Pharmacies, and Childcare

Emergency Services: Ambulance, Fire & Rescue, Police (known as Garda) .......................... 112 / 999

Non-emergency calls to the Garda .......................... +353 21 494 3330

SouthDoc: medical services from 6pm – 8am each day .......................... 1850 335 999

Irwin’s Pharmacy, 77 Shandon St. (9am – midnight)
Phelan’s Pharmacy, 9 Patrick St. (9am – 9pm)

Childcare. If you need assistance with childcare while attending the conference, please contact Barry O’Sullivan who can provide a variety of options for local creches.

5.3 Taxis, Travel, and Tourism

Cork Taxi Co-op .......................... +353 21 427 2222

Satellite Taxis .......................... +353 21 484 7277

Hailo .......................... https://hailocab.com/ireland

Cork Airport .......................... +353 021 431 3131

Irish Rail .......................... http://www.irishrail.ie/

Bus Éireann .......................... http://www.buseireann.ie/

There are many sites worth visiting around the city and surrounding regions, to name a few: the English Market; Cork City Gaol; Shandon Bells Tower; Fota Wildlife Park; Fitzgerald Park; Blackrock
Castle Observatory; Lewis Glucksman Gallery, UCC; Jameson Experience, Midleton.

A list of bars and restaurants can be found in the Whazoon guide in your conference bag.

Also, plenty of beautiful locations are within reach of the city, in particular Cobh, Kinsale, and many others in west Cork. For information these and many more suggestions visit:

http://www.discoverireland.ie – Discover Ireland

http://www.buseireann.ie – Bus Éireann

http://www.irishrail.ie – Iarnród Éireann (Irish Rail)

http://www.theleesessions.com — Traditional Irish music sessions in Cork
6 Maps

6.1 Map of the Western Gateway Building
6.2 Map of the UCC Campus and Cork City Centre

UCC Campus
Cork City Centre
# Conference at a Glance

<table>
<thead>
<tr>
<th>Monday 31/08/15</th>
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<tr>
<td>9:00 – 10:00</td>
<td>Workshops and Doctoral Programs</td>
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<tr>
<td>10:00 – 10:30</td>
<td>Coffee</td>
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<td>10:30 – 12:00</td>
<td>Workshops and Doctoral Programs</td>
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<td>12:00 – 1:30</td>
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<td>3:30 – 5:30</td>
<td>Workshops and Doctoral Programs</td>
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<td>5:30 – 6:00</td>
<td>CP: Industry Modelling Contest (G.05)</td>
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<th>Tuesday 01/09/15</th>
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<tr>
<td>8:45 – 9:00</td>
<td>Welcome (G.05)</td>
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<td>9:00 – 10:00</td>
<td>Invited talk: Friedrich (G.05)</td>
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<td>10:00 – 10:30</td>
<td>Coffee</td>
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<td>10:30 – 12:00</td>
<td>Award Winning Papers (G.05)</td>
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<td>12:00 – 1:30</td>
<td>Lunch</td>
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<td>1:45 – 3:00</td>
<td>CP: Complexity (G.01)</td>
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<td>3:00 – 3:30</td>
<td>CP: Tutorial: Answer Set Solving (G.03)</td>
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<td>3:30 – 5:10</td>
<td>ICLP: Program Analysis (G.05)</td>
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<td>5:15 – 6:15</td>
<td>ACP AGM (G.03)</td>
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<td>7:00 – 8:30</td>
<td>ICLP: Tutorial: Description Logic (G.05)</td>
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<th>Wednesday 02/09/15</th>
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<td>9:00 – 10:00</td>
<td>CP: invited talk: Smith (G.05)</td>
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<tr>
<td>10:00 – 10:30</td>
<td>ICLP: Invited talk: de Raedt (1.07)</td>
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<tr>
<td>10:30 – 12:00</td>
<td>CP: ACP Awards (G.05)</td>
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<td>12:00 – 1:30</td>
<td>ICLP: Technical Communications (1.07)</td>
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<td>1:45 – 3:00</td>
<td>CP: Alternative &amp; Hybrid (G.01)</td>
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<td>3:00 – 3:30</td>
<td>CP: Tutorial: Lagrangian (G.03)</td>
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<td>3:30 – 5:10</td>
<td>ICLP: Tabling &amp; Compilation (G.05)</td>
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<td>5:15 – 6:15</td>
<td>ICLP: Evaluation (G.05)</td>
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<td>6:30 – 8:00</td>
<td>ICLP: Tutorial: Answer Set Programming (G.05)</td>
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<td>7:45 – 9:45</td>
<td>ICLP: AIP Meeting (G.05)</td>
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<th>Thursday 03/09/15</th>
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<td>9:00 – 10:00</td>
<td>CP: invited talk: Bagley (G.05)</td>
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<td>10:00 – 10:30</td>
<td>ICLP: Invited talk: Lamma (1.07)</td>
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<td>10:30 – 12:00</td>
<td>CP: Applications (G.01)</td>
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<td>12:00 – 1:30</td>
<td>CP: Randomness &amp; Stochasticity (G.03)</td>
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<td>1:45 – 3:00</td>
<td>CP: Tutorial: XCS (G.01)</td>
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<td>CP: Tutorial: Consistency (G.03)</td>
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<td>3:30 – 5:10</td>
<td>CP: Industry problem solving (G.08)</td>
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<td>6:00 – 23:00</td>
<td>ICLP: Tutorial: Teaching (G.05)</td>
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<td>ICLP: Panel: Teaching (G.05)</td>
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<td>ICLP: Tutorial: Datalog+ (G.05)</td>
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<td>9:00 – 10:00</td>
<td>CP: MiniZinc Results (G.01)</td>
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<td>10:00 – 10:30</td>
<td>CP: Tractability (G.03)</td>
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<td>10:30 – 12:00</td>
<td>ICLP: Tutorial: Verification (G.05)</td>
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<tr>
<td>12:00 – 1:30</td>
<td>CP: Global Constraints (G.01)</td>
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<td>1:45 – 3:00</td>
<td>CP: SAT (G.03)</td>
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<td>3:00 – 3:30</td>
<td>ICLP: Technical Communications (G.05)</td>
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<tr>
<td>3:30 – 5:10</td>
<td>CP: Bioinformatics (G.01)</td>
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| 6:00 – 23:00    | Banquet (Ballymaloe House) |

| 9:00 – 10:00    | Coffee |
| 10:00 – 10:30   | CP: Global Constraints (G.01) |
| 12:00 – 1:30    | Lunch |
| 1:45 – 3:00     | CP: Tutorial: Bioinformatics (G.01) |
| 4:00 – 3:30     | CP: Applications (G.03) |
| 5:10            | Close |