

The 30th International Conference on Principles and Practice of Constraint Programming

30 years... a viewpoint

Laurent Michel and Barry O'Sullivan | Sept 2 - 6, 2024, GIRONA, CATALONIA

30 Years...

- Once upon a time...
 - We had workshops!
 - PPCP93 : First Workshop on Principles and Practice of Constraint Programming, April 28-30, 1993, Newport, Rhode Island, USA
 - PPCP94 : Second Workshop on Principles and Practice of Constraint Programming, May 2-4, 1994, Rosario, Orcas Island, Washington, USA

The Newport

Paper

The actor

U. Montan

M. Henz, G

Zhang, A.

D. Pai, K. M

Tretkoff, D. Kap

J. Hooker, P.

Freuder, T,

23 Papers, 6 Areas

6 areas ?

Concurrency

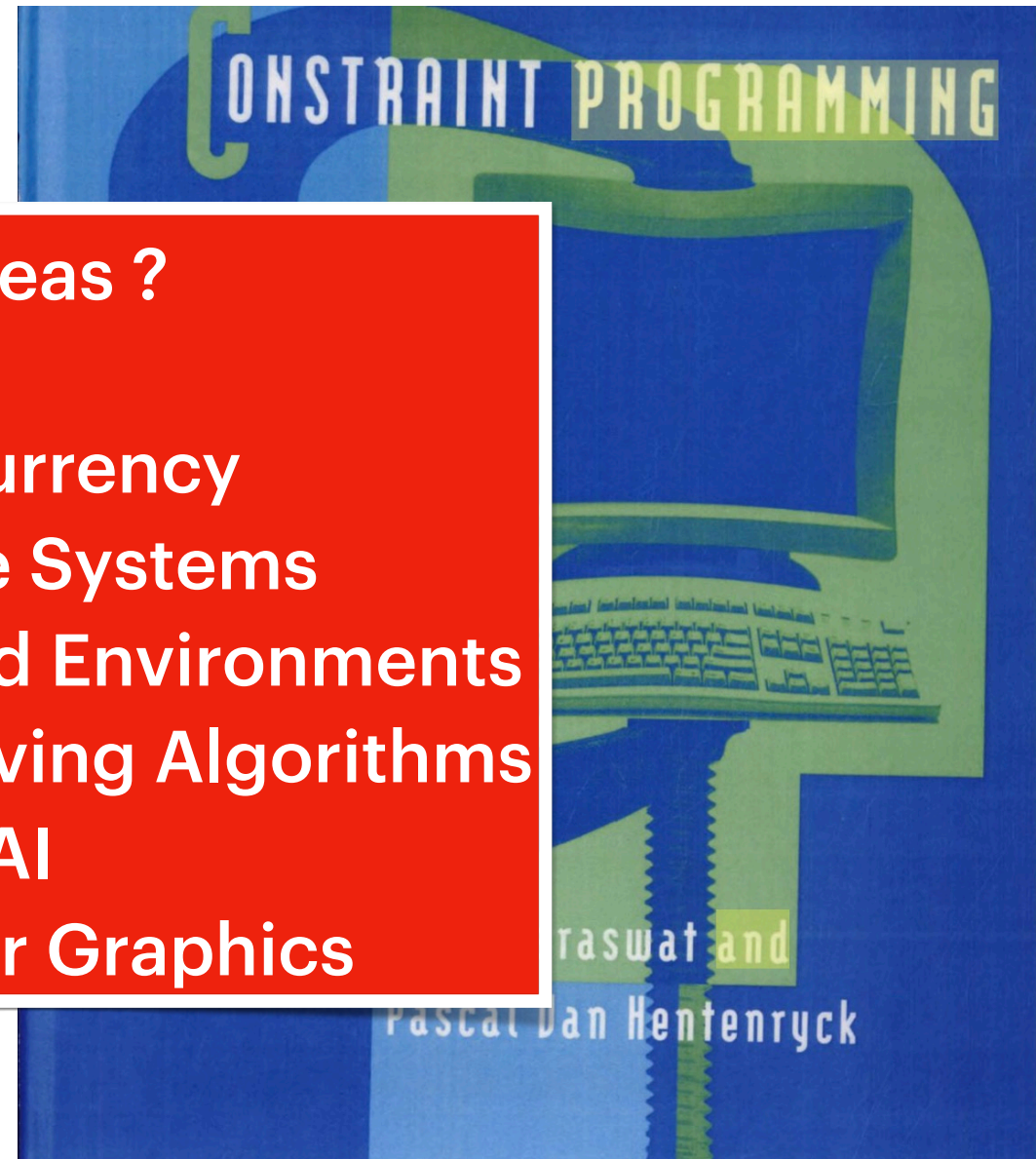
Reactive Systems

Languages and Environments

Constraint Solving Algorithms

AI

Computer Graphics



Courtesy: G. Pesant



All of them...

19 Sep - 22 Sep 1995	Cassis France
19 Aug - 22 Aug 1996	Cambridge USA
29 Oct - 1 Nov 1997	Linz Austria
26 Oct - 30 Oct 1998	Pisa Italy
11 Oct - 14 Oct 1999	Alexandria USA
18 Sep - 21 Sep 2000	Singapore Singapore
26 Nov - 1 Dec 2001	Paphos Cyprus
9 Sep - 13 Sep 2002	Ithaca USA
29 Sep - 3 Oct 2003	Kinsale Ireland
27 Sep - 1 Oct 2004	Toronto Canada
1 Oct - 5 Oct 2005	Sitges Spain
25 Sep - 29 Sep 2006	Nantes France
23 Sep - 27 Sep 2007	Providence USA
14 Sep - 18 Sep 2008	Sydney Australia
20 Sep - 24 Sep 2009	Lisbon Portugal
6 Sep - 10 Sep 2010	St Andrews Scotland

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12 Sep - 16 Sep 2011	Perugia Italy
8 Oct - 12 Oct 2012	Quebec City Canada
16 Sep - 20 Sep 2013	Uppsala Sweden
8 Sep - 12 Sep 2014	Lyon France
31 Aug - 4 Sep 2015	Cork Ireland
5 Sep - 9 Sep 2016	Toulouse France
28 Aug - 1 Sep 2017	Melbourne Australia
27 Aug - 31 Aug 2018	Lille France
30 Sep - 4 Oct 2019	Stamford USA
7 Sep - 11 Sep 2020	Louvain-la-Neuve (virtual) Belgium
25-29 Oct 2021	Montpellier (virtual) France
31 July - 8 Aug 2022	Haifa Israel
2023	Toronto Canada

The

areas (sessions really)...

SAT & MaxSAT

Local Search

Search Heuristics

Machine Learning

Scheduling, Globals

Applications, Graphs, Certification & Testing

Computer Hardware

Theory & Complexity, Model Counting

3

Early (1995/1996) versus Recent (2023/2024)

- A View of Local Search in Constraint Programming
- Cumulative Scheduling with Calendars and Overtime
- An Efficient Local Search Solver for Mixed Integer Programming
- Constraint Propagation in Model Generation
- Structure-Guided Local Improvement for Maximum Satisfiability
- Using Constraint Programming for Disjunctive Scheduling in Temporal AI Planning
- Encoding the Hamiltonian Cycle Problem into SAT Based on Vertex Elimination
- Optimization-based Heuristics for Maximal Constraint Satisfaction
- Constraint Satisfaction in Optical Routing for Passive Wavelength-Routed Networks
- The Independence Property of a Class of Set Constraints

Early (1995/1996) versus Recent (2023/2024)

- **A View of Local Search in Constraint Programming [EARLY]**
- Cumulative Scheduling with Calendars and Overtime [LATE]
- An Efficient Local Search Solver for Mixed Integer Programming
- **Constraint Propagation in Model Generation**
- Structure-Guided Local Improvement for Maximum Satisfiability
- **The Independence Property of a Class of Set Constraints**
- Using Constraint Programming for Disjunctive Scheduling in Temporal AI Planning
- Encoding the Hamiltonian Cycle Problem into SAT Based on Vertex Elimination
- **Optimization-based Heuristics for Maximal Constraint Satisfaction**
- **Constraint Satisfaction in Optical Routing for Passive Wavelength-Routed Networks**

So what?

- CP has evolved!
 - Evolution is natural
 - Some topics still very much relevant
 - Reflects degrees of adaptation to today's reality

Yet..... This is a bit serious!

What if....

- CP's story was like a movie?

CP happened in Middle Earth

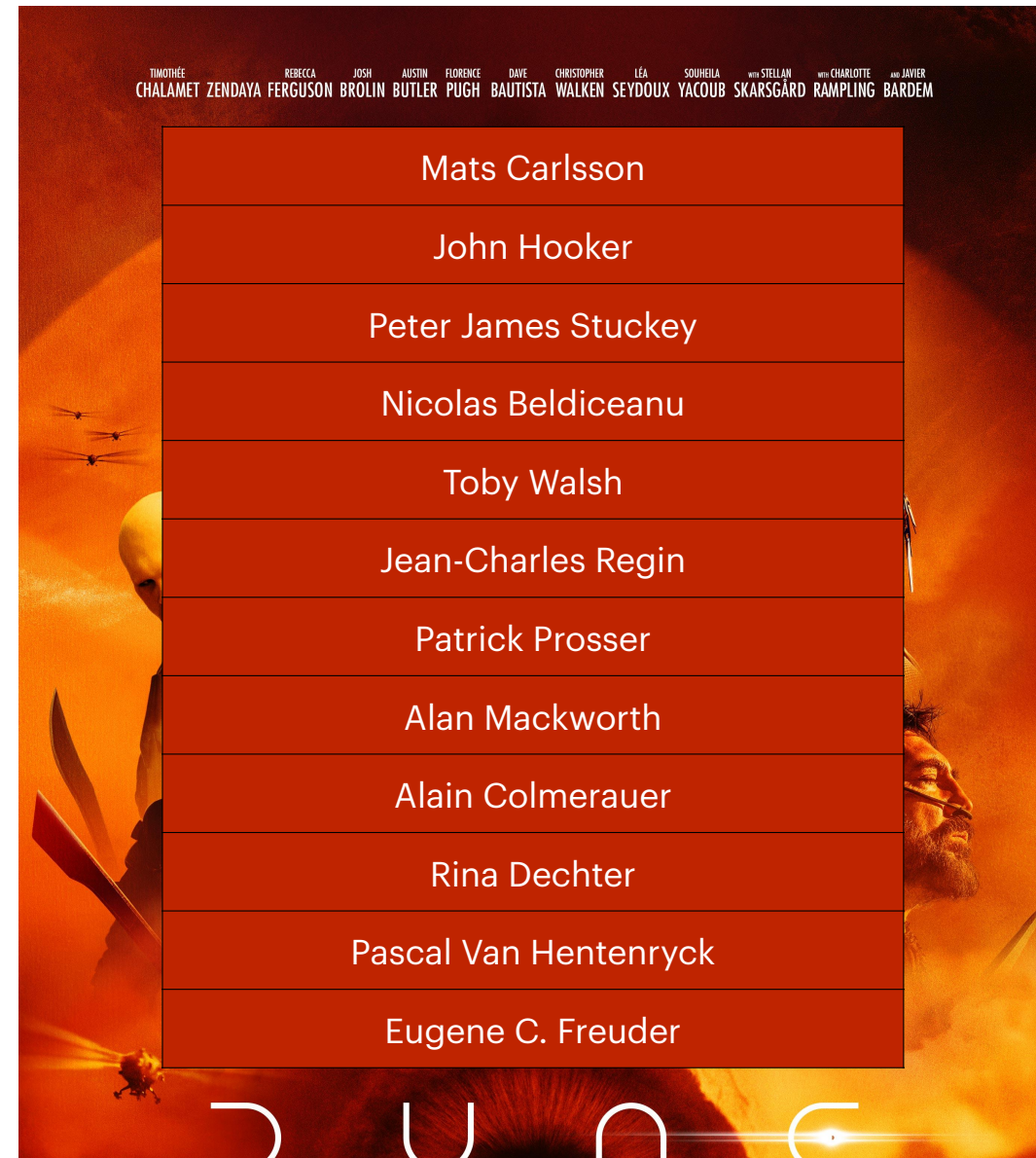
solvers

- There would be 19 ~~rings~~ of power!
 - 3 for the elves *SCIP, CPLEX, Gurobi?*
 - 7 for the dwarves *CADical, Clasp, Glucose, Minisat, Kissat, Lingeling, Sat4J*
 - 9 for the man *IBM-IlogCPO, Gecode, ORTools, Chuffed, MiniCP, Choco, Picat, CHIP, JaCOP, Minion, ...*
- One ring to rule them all and in darkness bind them....
An hybrid one.... : [Pick your favs here! MiniZinc, IBM-OPL, Essence, Comet,....]
- Who would be the bad guys?
 - Mind Less Orcs ?
 - Sauron ?
 - Saruman ?



CP IN JUNE

- There would be mentats!
 - Human computers ;-)
 - Well, we do have a list. It's called "Research Excellence Awards"
- There would be rival families
 - Atreides *CP* *MIP* *SAT*
 - Harkonnens *SAT* *CP* *MIP*
 - Corrinos *MIP* *SAT* *CP*
- The Bene Gesserit... [Jury is out!]
- And a prophet?





Research Excellence Awardee Interviews

Association for Constraint Programming

7 videos 72 views Updated 3 days ago






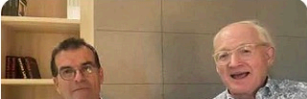


▶ Play all

↻ Shuffle

...More

<https://www.youtube.com/playlist?list=PLcByDT7vRTb9PrIY7RVgb9S0wnNyu3MW>

-  **1 Interview with Eugene Freuder 2005 Research Excellence Awardee**
Association for Constraint Programming • 23 views • 3 days ago
-  **2 Interview with Rina Dechter 2007 Research Excellence Awardee**
Association for Constraint Programming • 18 views • 3 days ago
-  **3 Interview with Alan Mackworth 2009 Research Excellence Awardee**
Association for Constraint Programming • 9 views • 3 days ago
-  **4 Interview with Patrick Prosser 2011 Research Excellence Awardee**
Association for Constraint Programming • 14 views • 3 days ago
-  **5 Interview with Jean-Charles Régin 2013 Research Excellence Awardee**
Association for Constraint Programming • 13 views • 3 days ago
-  **6 Interview with Toby Walsh 2015 Research Excellence Awardee**
Association for Constraint Programming • 19 views • 3 days ago

**If there is a Prophet
there is a Prophecy
and thus a grail?...**

CP as PoTH

- We have our very own director
 - Eugene Freuder
 - The 1997 Script (<https://dl.acm.org/doi/fullHtml/10.1145/242224.242304>)
- It's in pre-production in a workshop
 - 7th Workshop on Progress Towards the Holy Grail (PTHG-24)
- Still a good motto
 - Declarative, Efficient, Natural
- And meaninfull directions
 - Modeling, Interactions, Explanations, Knowledge, Agents, Evaluation, Synthesis



Where to Next ?

(movie-wise that is!)

The Matrix

Awakening

- Euh?



Iconic Scenes



Iconic Scenes

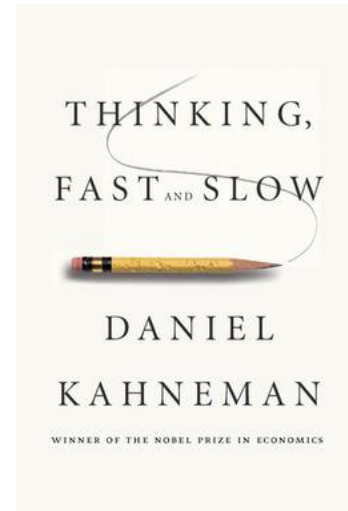
- Doing some things...

Fast	Slow
Operational	Tactical / Strategic
ML-style technique	Model-based reasoning

- Deciding when to do one or the other...
 - Meta-level to switch!



We already have that!



Go listen to Francesca's Invited Talk on Thursday

Thinking fast and Slow in AI:
A cognitive architecture to augment both AI and human reasoning