

Hybrid Numeric Constraints & Applications

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ACP Summer School

“Hybrid Methods for Constraint Programming”

Turunç

- ▶ Hybrid Constraints over Continuous Domains: introduction
 - ▶ Motivations
 - ▶ Interval Programming
 - ▶ Constraint Programming on continuous domains
 - ▶ Applications
- ▶ Constraint Programming over Continuous Domains
 - ▶ Basics on Numeric CSP
 - ▶ Local consistencies
 - ▶ Relations between 2B, Box and 3B consistencies
 - ▶ Implementation issues: 2B, Box, 3B, HC4 Revise, Mohc
 - ▶ Global constraint: Quad filtering
 - ▶ Search
- ▶ Applications
 - ▶ Hybrid CSP & Global Optimization
 - ▶ Program verification
 - ▶ Refining AI Approximations with hybrid CP solvers
 - ▶ Hybrid Constraint-Based Bounded Program Verification

- ▶ Ramon E. Moore, R. Baker Kearfott, Michael J. Cloud, **Introduction to Interval Analysis**, SIAM, 2009
- ▶ Frédéric Benhamou, Laurent Granvilliers, **Continuous and Interval Constraints**, chapter 16 of *Handbook of Constraint Programming*, Elsevier, 2006.
- ▶ Jiri Rohn, **A Handbook of Results on Interval Linear Problems**,
<http://uivtx.cs.cas.cz/~rohn/handbook>, 2005.
- ▶ Eldon Hansen, G. William Walster **Global Optimization Using Interval Analysis**, 2. Ed. , Revised And Expanded , Marcel Dekker, 2004.

- ▶ Luc Jaulin, Michel Kieffer, Olivier Didrit, Eric Walter, **Applied Interval Analysis**, Springer, 2001
- ▶ Pascal Van Hentenryck, Laurent Michel, Yves Deville, **Numerica: A Modeling Language for Global Optimization**, MIT Press, 1997.
- ▶ Arnold Neumaier, **Interval Methods for Systems of Equations**, Cambridge University Press, 1990

Constraint Journal:

<http://www.crt.umontreal.ca/~pesant/Constraints/constraints.html>

<http://www.springer.com/computer/ai/journal/10601>

CPL(Constraint Programming Letters):

<http://www.cs.brown.edu/people/pvh/CPL/cpl.html>

Reliable Computing:

www.cs.utep.edu/interval-comp/rcjournal.html

COCONUT Environment:

http://www.mat.univie.ac.at/users/coconut/public_html/coconut-environment

Realpaver:

<http://pagesperso.lina.univ-nantes.fr/info/perso/permanents/granvil/realpaver/index.html>

Gaol:

<http://sourceforge.net/projects/gaol>

IBEX

<http://www.emn.fr/z-info/ibex/index.html>

GlobSol :

http://interval.louisiana.edu/GlobSol/download_GlobSol.html

ICOS :

<http://sites.google.com/site/ylebbah/icos>