CIRRELT

SÉMINAIRE / SEMINAR

Holger H. Hoos

The University of British Columbia, Vancouver

"Taming the Complexity Monster"

Résumé / Abstract

We live in interesting times - as individuals, as members of various communities and organisations, and as inhabitants of planet Earth, we face many challenges, ranging from climate change to resource limitations, from market risks and uncertainties to complex diseases. To some extent, these challenges arise from the complexity of the systems we are dealing with and of the problems that arise from understanding, modelling and controlling these systems. As computing scientists and IT professionals, we have a lot to contribute: solving complex problems by means of computer systems, software and algorithms is an important part of what our field is about.

In this talk, I will focus on one particular type of complexity that has been of central interest in many areas within computing science and its applications, namely computational complexity, and in particular, NP-hardness. I will investigate the question to which extent NP-hard problems are as formidable as is often thought, and I will present an overview of research that fearlessly, and perhaps sometimes foolishly, attempts to deal with these problems in a rather pragmatic way. I will also argue that the area of empirical algorithmics holds the key to solving computationally challenging problems more effectively than many would think possible, while at the same time producing interesting scientific insights. The problems I will be covering include SAT and TSP, two classical and very prominent NP-hard problems; in particular, I will present empirical scaling results for the best-performing complete TSP solver currently known and discuss recent improvements in the state of the art in solving SAT-encoded software verification problems. I will also briefly discuss new results in the areas of timetabling, protein structure prediction and analysis of financial market data.

Note biographique / Biographical note

Holger H. Hoos est professeur agrégé au département d'informatique de l'Université de la Colombie-Britannique. / Holger H. Hoos is Associate Professor at the Department of Computer Science of the University of British Columbia. hoos@cs.ubc.ca and http://www.cs.ubc.ca/people/profile.jsp?id=hoos/

VENDREDI / FRIDAY

9 octobre 2009 / October, 9, 2009

14h30

Salle / Room 5441
Pavillon André-Aisenstadt
Université de Montréal

Bienvenue à tous / Welcome to all

Responsable/Organizer : Bernard Gendron

Information : Pierre Marchand
Responsable des communications du CIRRELT
pierre.marchand@cirrelt.ulaval.ca

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