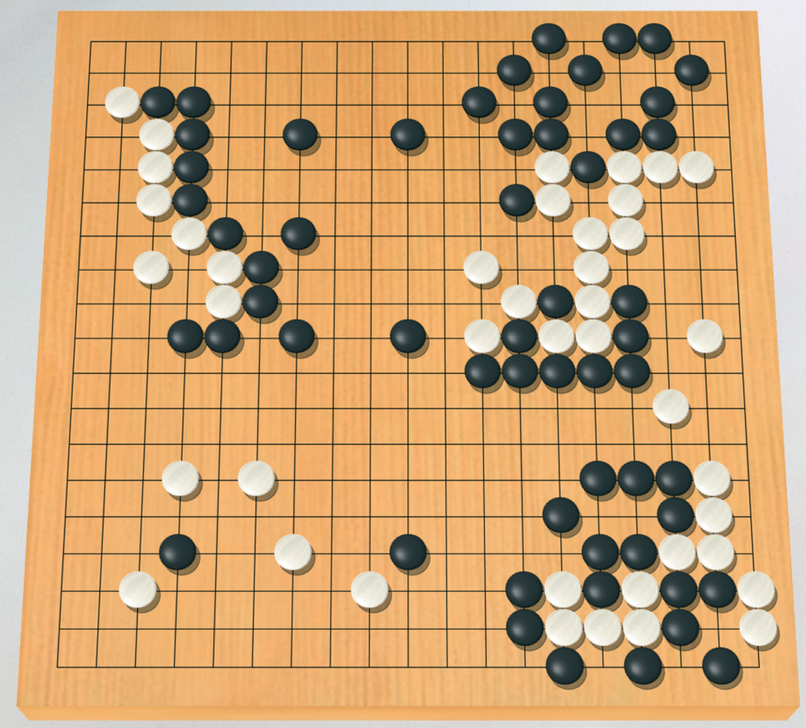
Supercomputer beats Go pro

The game of Go

- Thousands of years old
- 40 millions players, mostly in Asia.
- The rules are simpler than the rules of chess.
- Considered by many as the game in which making a strong program is the most difficult.
- Hundreds of Go programs have been designed.



Our Go Program: MoGo

- Started in 2006 as a master project in University of Paris 11.
- At the moment, four persons are working full time on the project, in Paris and Maastricht.
- Partners:

INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET EN AUTOMATIQUE
INRIA
centre de recherche SACLAY - ÎLE-DE-FRANCE

PASCAL2
Pattern Analysis, Statistical Modelling and Computational Learning

UNIVERSITÉ PARIS-SUD 11

Grid'5000

NWO
Netherlands Organisation for Scientific Research

CNRS
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE

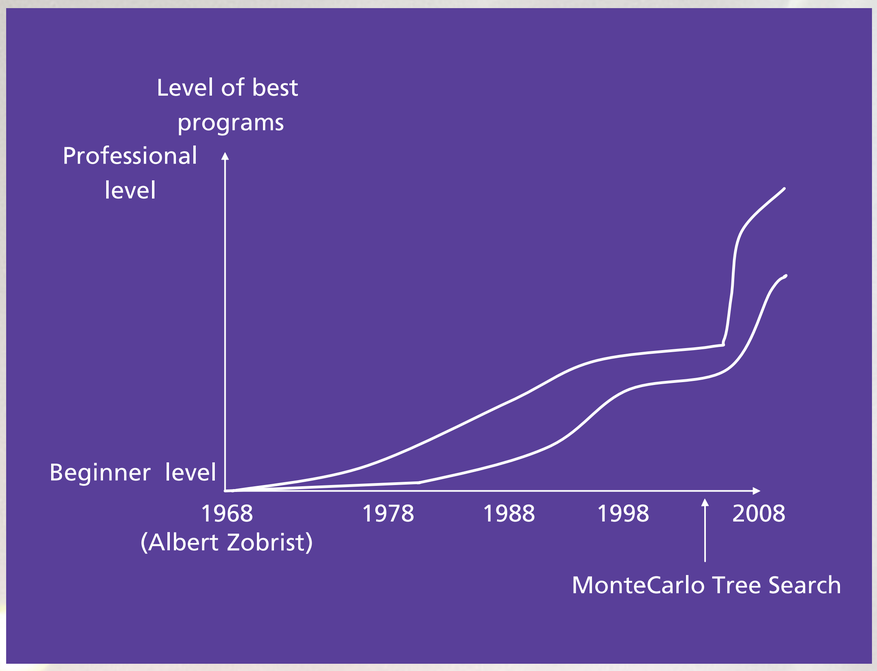
sara

- Academic program: our techniques are published.
- Main results:
  - Gold medal at the 12th Computer Olympiad (Amsterdam, July 2007)
  - First program to defeat a professional on the 9x9 board (Paris, March 2008)
  - First program to defeat a professional on the 19x19 board with 9 stones handicap (Portland, August 2008)
  - Silver medal at the Computer Olympiad (Beijing, October 2008) (best academic program)
- Current hardware: 10 to 25 nodes of the supercomputer Huygens

Jean-Yves Audibert, Guillaume Chaslot, Christophe Fiter, Sylvain Gelly, Jean-Baptiste Hoock, Rémi Munos, Arpad Rimmel, Olivier Teytaud, Yizao Wang, Ziqin Yu

The new "Monte-Carlo Tree Search" Framework

- Invented in 2006
- Led to a revolution in the level of programs.
- Compact and versatile framework.
- Works in situations in which the Alpha-Beta framework is inefficient.
- Computationally expensive
- Highly scalable



The supercomputer Huygens

- 128 GByte of memory per node
- 16 Power6 dual-cores processors at 4.7Ghz per node.
- Infiniband network between nodes.
- Total performance: 60 Teraflops, MoGo uses up to 14.
- The high number of nodes and the high speed of each core, makes Huygens one of the best computer in the world to maximize the speed-up.
- MoGo uses a computational power which is 1000 times more than the chess program Deep Blue.

Holland