

A new world record in Go established by PRACE prototype and French software

This is a joint press release of NWO-NCF/EW, SARA and PRACE

At the Taiwan Open 2009 held in Taiwan from February 10-13, the Dutch national supercomputer Huygens, which is located at SARA Computing and Networking Services in Amsterdam, defeated two human Go professionals in an official match. This is the second victory of Huygens playing Go against professional players. During the first two days of the event, the Go program MoGo TITAN sets two new world records by winning a 19x19 competition with a 7-stones handicap against the 9P dan professional Go player **Jun-Xun Zhou**, and a 19x19 competition with a 6-stones handicap against the 1P dan professional Go player **Li-Chen Chien**.

The first victory of the Huygens supercomputer was achieved in August 2008 at the 24th Annual Congress of the Go competition, held in Portland, Oregon when the 8P dan human Go professional **Kim MyungWan** was defeated in an official match with a 9-stones handicap.

After the victory of IBM's Deep Blue against **Garry Kasparov**, the game of Go has replaced chess as a test bed for research in artificial intelligence (AI). Go is one of the last board games where humans are still able to easily win against AI. Although there has been quite some research in the Go domain for 40 years, the progress in Computer Go has been slow. However, researchers have discovered new performing algorithms and computers are catching up really fast. Since 2006, when a new algorithm called Monte-Carlo Tree Search was proposed, the level of Go programs has improved drastically. The application 'MoGo TITAN', developed by INRIA France and Maastricht University, runs on the Dutch national supercomputer Huygens, which is one of the PRACE prototypes.

The French partners are Tao, INRIA, CNRS, LRI, Université Paris-Sud, Grid5000 with "top" contributors Jean-Baptiste Hoock, Arpad Rimmel and Olivier Teytaud. Top contributor for the Maastricht University was Guillaume Chaslot. Other contributors were Christophe Fiter, Sylvain Gelly, Julien Perez, Yizao Wang. The games were organized mainly by Chang-Shing Lee and MeiHui Wang, National University of Tainan (Taiwan).

Dr. Anwar Osseyran, SARA Managing Director: "This new milestone in AI research once again clearly demonstrates the great potential of Huygens in many non-traditional areas of usage of Supercomputing."

Financers:

The research in this project has been financed through the GoForGo project by the Physical Sciences council of the Netherlands Organisation for Scientific Research (NWO) and by the French financers Tao, INRIA, CNRS, LRI, Université Paris-Sud, while the CPU hours of Huygens were granted by the Netherlands National Computing Facilities Foundation (NCF).

Dr. Patrick Aerts, NCF Director: "One of NCF's aims is to facilitate all scientific research disciplines which can benefit from High Performance Computing (HPC). Apart from traditional areas as

computational fluid dynamics and theoretical chemistry, it is encouraging to see that more and more other areas, like AI, explore the opportunities offered by HPC for their research fields."

System:

Huygens, an IBM Power 575 Hydro-Cluster system, is the national supercomputer and located at SARA Computing and Networking Services in Amsterdam. The system, which is in production since August 2008, has a peak speed of 60 trillion calculations per second (Teraflop/s), 3328 Power6 processor cores at 4.7 GHz, a total memory capacity of more than 15 TB, and almost 1,000 TB disk capacity.

The PRACE project has identified several prototype architectures, which will be assessed within the project. The Huygens system is one of these prototype architectures.

About NWO-NCF/EW: NCF is an independent foundation under the umbrella of the Netherlands Organisation for Scientific Research (NWO). NCF is responsible for the high-end computing infrastructure for science and public research in the Netherlands.

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About SARA: SARA Computing and Networking Services is the Dutch National Supercomputing and grid center and offers a complete package of advanced ICT services including high performance computing & visualization, high performance networking, grid and other e-Science services. SARA is one of the major European ICT supernodes and a Tier-1 center for CERN. SARA houses and manages the national capacity and capability supercomputers and gives support to the users of these systems. Furthermore, SARA is responsible for the Network Operations Center of the academic high-bandwidth network SURFnet, houses the optical exchange point NetherLight, which connects many National Research and Education Networks, and has the first European Virtual Reality CAVE™.

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About PRACE: Through NCF and SARA, the Netherlands is an active partner in the PRACE project, The Partnership for Advanced Computing in Europe. PRACE prepares the creation of a persistent pan-European HPC service, consisting of several tier-0 centres providing European researchers with access to capability computers and forming the top level of the European HPC ecosystem. The PRACE project receives funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° RI-211528.

