Interview of Robert Houdart, the Creator of the Strongest Chess Engine in the world: Houdini

Q: Robert Houdart, please introduce yourself to our readers.
I'm 43 years old, live in the Dutch-speaking part of Belgium near the city of Leuven (mostly known for its 600-year old University and its beer Stella Artois), happily married, 3 wonderful daughters between 10 and 16 years old.
As a university engineer specialized in mechanical analysis (structural analysis, vibration analysis and heat transfer) during the 1990s I've worked in the design and analysis of Nuclear Power Plants, more specifically the behavior of piping in NPP during earth quakes and airplane crashes.
Since 2000 my professional activity has been software architect and R&D Manager for CRM software (Customer Relationship Management).

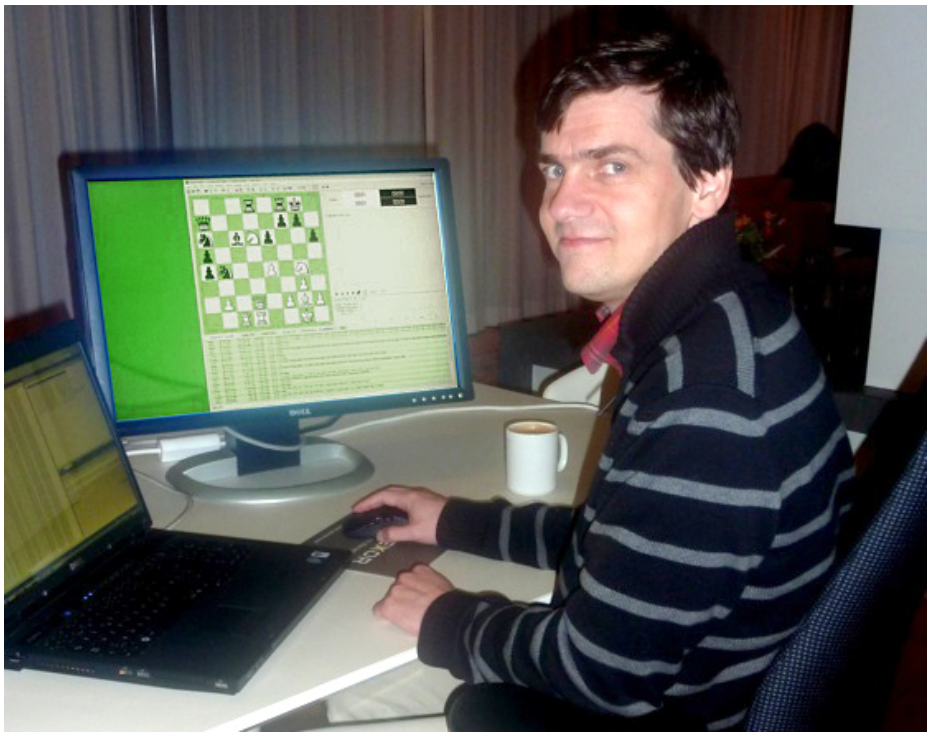
Q: Do you play chess yourself, do you have any chess idols?
I learned chess at the age of 14 and played for nearly 20 years in the team of my home town Leuven in Belgium. My best rating during the 1990s was about 2250, and my style has always been rather positional. With White I've always opened with d4, with Black I've mainly played the French and the King's Indian.
Growing up (in chess terms) during the 1980s meant that my chess heroes obviously were Anatoly Karpov for his superb positional style, and Gary Kasparov for his energetic, superior all-round play. I consider the latter the best chess player ever.
From the current generation of players my favorite is world champion Viswanathan Anand, he's such an outstanding player, gentleman and great ambassador of the chess world.

Q: How did you get involved in chess engine programming?
Computer programming has been my hobby and passion for nearly 30 years now. During those 30 years I've touched many programming languages and computer systems.
My interest in chess programming started with Psion Chess written by Richard Lang around 1985. I studied this program quite extensively, and was struck by its elegant implementation. I picked up the theoretical foundations of chess programming from the book "Schaken voor Computers" ("Chess for Computers", van Diepen & van den Herik, 1987).
Since the late 1980s I've written several private chess programs in different languages (Assembler, Pascal, C), for fun and education. Basically every couple of years, in late spring the chess programming virus would activate itself and I would spend the summer writing some new element of a chess program or a new engine altogether.

Q: Tell us about the history of Houdini.
The Houdini project started in mid-2009, when I was once again struck by the chess programming virus. This time was different, though, after all my previous private engines, I felt it was time to create a very strong engine.
Compared to the 1980s or 1990s in recent years there's a wealth of information available on the Internet - in a matter of seconds anyone has access to information that otherwise would have taken years to collect or would simply never have surfaced. Houdini has benefitted greatly from this internet culture and contains ideas and techniques coming from, for example, the excellent Chess Programming wiki and from several open-source engines. Adding my own algorithmic improvements based on 20+ years of chess programming and my strength as a chess player, the result was an engine that has been undisputedly at the top of the rating lists for over a year now.
It is interesting to note that chess engines in general , and Houdini 2 in particular, are a lot stronger than 10 to 15 years ago. Probably most readers will remember the 1997 match between Kasparov and Deep Blue, in which for the first time the human World Champion lost a match against a

computer chess program. Deep Blue was a huge array of sophisticated hardware and software capable of evaluating about 200 million chess positions per second.
If you run nowadays Houdini 2 on a mainstream CPU from Intel or AMD available at less than $300, you will produce approximately 10 million positions per second, but software has improved significantly and Houdini 2 would easily beat Deep Blue. The incredible strength clearly shows when you kibitz a GM game with Houdini on a laptop at home, I'm always surprised at the number of mistakes the human GMs play and that would otherwise go unnoticed.

Q: What is so special about Houdini?
Houdini's main features are excellent position evaluation combined with the most sophisticated search algorithm.
The key to Houdini's efficient search algorithm is its selectivity. Just like a human player, a chess engine investigates some (bad) moves very shallowly and some (good) moves very deeply. The art of creating a chess engine is to find a balance between the risk of missing a good move and the loss of time spent on bad moves. With Houdini I've found an excellent balance between the two. Evidence of this is that even at short time controls Houdini will often find the best move in a position.
Houdini has an excellent positional evaluation in all phases of the game because of its many relevant positional evaluation terms that have been tuned using several millions of chess games. Strong and creative in the opening, striving relentlessly for initiative in the middle game, accurate in the end game. In particular I've tried to make the Houdini evaluations as useful as possible for estimating the outcome of the game – therefore Houdini is slightly more pessimistic than other engines in its evaluations. If Houdini shows that you're +1.00 pawn up, you know you have a very good chance of winning the game.



From a human point of view Houdini's style is sumptuous, in attack as well as in defense. I cannot find any better way of expressing it than by quoting the Chess Club Live Facebook page: *"If there ever was a computer descendant of the romantic players like Morphy, Anderssen, Spielmann, Marshall, Bogojulbow, Tal, Nezhmetdinov, Shirov, Morozevich it would be Houdini. Houdini is the current World number 1 chess engine and plays in a very romantic style."*.
When following some of the games of Houdini (for example in its match against Rybka in the TCEC championships beginning of 2011), one sometimes gets the impression of a super-human chess understanding that allows Houdini to sacrifice a pawn , two pawns, three pawns and crush the opponent.
Another main feature of Houdini is its simplicity in use. I've strived to tune the default parameters as well as possible so that Houdini will deliver great performance right out of the box. Unlike many other engines there's no difficult configuration to be made, and I purposely try to limit the number of configurable parameters to keep everything as simple as possible.

For correspondence chess players Houdini 2 offers advanced features including Learning and Persistent Hash, multi-PV analysis, Mate Search and access to different kinds of End Game Table Bases, but all these features are optional and don't interfere with the basic engine functions.
The Pro version of Houdini provides the most powerful chess engine on the planet. Using up to 32 cores and 32 GB of hash memory, Houdini 2 Pro is extremely well optimized and will take full advantage of the hardware - up to the point that hardware manufacturers and testers are starting to use Houdini to benchmark their CPUs. Houdini 2 Pro is the only engine that can exploit modern NUMA-based motherboards to provide an extra boost in performance for people looking for the very best.

Q. How can we find out more about Houdini?
You can visit my web site www.cruxis.com/chess/houdini.htm or the web sites of my two exclusive partners companies who integrate Houdini in their products www.chessok.com for Chess Assistant & Aquarium, and www.chess-king.com for Chess King and Chess King Pro.

Q. What top chess players do you know for a fact use Houdini?
I know for sure that many of the world's top players use Houdini. GMs that have publicly said they're using and/or preferring Houdini are Anand, Svidler, Giri and Finegold.

Q. What are the current ratings of chess engines?

The most authoritative engine rating list is IPON (http://www.inwoba.de) which conducts one-on-one tourneys. Below is the ranking of the best 23 engines as of September 2011.

1	Houdini 2.0 STD	3024
2	Komodo64 3 SSE42	2969
3	Critter 1.2	2959
4	Deep Rybka 4.1 SSE42	2958
5	Stockfish 2.1.1 JA	2943
6	Naum 4.2	2834
7	Gull 1.2	2802
8	Deep Shredder 12	2800
9	Deep Sjeng c't 2010 32b	2798
10	Deep Fritz 12 32b	2790
11	Spike 1.4 32b	2788
12	Hannibal 1.1	2764
13	Protector 1.4.0 x64	2763
14	spark-1.0 SSE42	2756
15	HIARCS 13.2 MP 32b	2752
16	Deep Junior 12.5	2736
17	Zappa Mexico II	2710
18	Deep Onno 1-2-70	2690
19	Strelka 2.0 B	2676
20	Umko 1.2 SSE42	2670
21	Loop 13.6/2007	2635
22	Jonny 4.00 32b	2611
23	Crafty 23.3 JA	2592

Thank you for answering our questions.

Special offer for Readers of Black & White
You will find in this magazine a special $40 coupon, that will allow you to get Chess King with Houdini 2 for $59 instead of $99 and Chess King with Houdini 2 Pro for $109 instead of $149. Jumpstart your chess career with the best chess engine available in the market: Houdini!