

[Home](#) * [Engines](#) * **Deep Thought**

Deep Thought I - circuit board ^[2]

Deep Thought,

was a computer chess machine built at [Carnegie Mellon University](#) in the 1980's, the predecessor to [Deep Blue](#). The project was initially started 1985 as [Chiptest](#) by the computer science doctoral students [Feng-hsiung Hsu](#) and [Thomas Anantharaman](#). [Murray Campbell](#), former co-developer of [HiTech](#), joined the ChipTest team a few month later - followed by [Andreas Nowatzky](#), [Mike Browne](#) and [Peter Jansen](#). The program was named Deep Thought after the fictional computer of the same name ^[1].

Table of Contents

[Photos](#)

[Achievements](#)

[Hardware](#)

[Software](#)

[See also](#)

[Publications](#)

[Forum Posts](#)

[1989](#)

[1990 ...](#)

[2000 ...](#)

[External Links](#)

[References](#)

[What links here?](#)

Photos

[Murray Campbell](#), [Feng-hsiung Hsu](#), [Thomas Anantharaman](#), [Mike Browne](#) and [Andreas Nowatzky](#), after winning the [Fredkin Intermediate Prize](#) for Deep Thought's Grandmaster-level performance. ^[3]

Achievements

- In [1988](#) Deep Thought and Grandmaster [Tony Miles](#) shared first place in the Software Toolworks Open in Los Angeles. Deep Thought had a 2745 performance rating, and moved its [U.S. Chess Federation](#) (USCF) rating up to 2551, and qualified for the \$10,000 [Fredkin Intermediate Prize](#) as the first computer to achieve a USCF performance rating of 2500 over a set of 25 contiguous games in human tournaments ^[4]
- In 1988 Deep Thought won the [ACM championship in Orlando](#)
- In [1989](#) Deep Thought won the [6th World Computer Chess Championship in Edmonton](#), with a perfect 5-0 score
- In 1989 [Garry Kasparov](#) defeated Deep Thought in a [match by winning 2 games](#)
- In 1989 Deep Thought won the [ACM championship in Reno](#) (tied with [HiTech](#) ^[5])
- In 1989 Deep Thought beat International Master [David Levy](#) in a [match with 4 wins](#)
- In 1989 [IBM](#) started working on [Deep Blue](#)
- In [1990](#) Deep Thought won the [ACM championship in New York City](#)
- In [1991](#) Deep Thought II won the [ACM championship in Albuquerque](#)

Hardware



[Photomask](#) of the [move generation chip](#), a [combinational logic](#) 8x8 [array](#) ^[6]

Software

```
LB_Capt_start_I:
    if (hashpt->type == FAIL_I
        hashpt->score >= max)
        pstat = 0;
        if (FAILSOFT)
            max = sp->checkmat
            goto LB_Capt_start3_I1
    }
    if (FAILSOFT)
        max = sp->checkmate;
        goto LB_Capt_start3_1;
```

View into Deep Thought's source written in [C](#) with [gotos](#) ^[7]

See also

- [Chiptest](#)
- [Deep Blue](#)
- [Eval Tuning in Deep Thought](#)
- [Fiction](#)
- [Kasparov versus Deep Thought 1989](#)
- [Levy versus Deep Thought 1989](#)
- [Thought](#)

Publications

- [Thomas Anantharaman](#), [Murray Campbell](#), [Feng-hsiung Hsu](#) (1988). *Singular extensions: Adding Selectivity to Brute-Force Searching*. AAAI Spring Symposium, Computer Game Playing, pp. 8-13. Also published in [ICCA Journal, Vol. 11, No. 4](#), republished (1990) in [Artificial Intelligence](#), Vol. 43, No. 1, pp. 99-109. ISSN 0004-3702.
- [Hans Berliner](#) (1989). *Deep Thought Wins Fredkin Intermediate Prize*. AI Magazine Volume 10 Number 2, [pdf](#)
- [David Levy](#) (1990). *The End of an Era*. [ICCA Journal, Vol. 13, No. 1](#) » [Levy versus Deep Thought](#)

[1989](#)

- [Michael Valvo](#) (1990). *Moral Victory: Karpov versus Deep Thought at Harvard*. [ICCA Journal](#), Vol. 13, No. 1 ^[8]
- [Feng-hsiung Hsu](#), [Thomas Anantharaman](#), [Murray Campbell](#), [Andreas Nowatzky](#) (1990). *Deep Thought*. [Computers, Chess, and Cognition](#), pp. 55-78
- [Feng-hsiung Hsu](#), [Thomas Anantharaman](#), [Murray Campbell](#), [Andreas Nowatzky](#) (1990). *A Grandmaster Chess Machine*. [Scientific American](#), Vol. 263, No. 4, pp. 44-50. ISSN 0036-8733.
- [Frederic Friedel](#) (1991). *Not the Mother of all Chess Machines*. [ICCA Journal](#), Vol. 14, No. 2 ^[9]
- [Robert Levinson](#) (1991). *Man and machine, theory and practice square off in Sydney*. [ICCA Journal](#), Vol. 14, No. 3 ^{[10] [11]}
- [Paul Hsieh](#) (1996). *Deep Blue - Deep Thought 2*. [Computer Chess Reports](#), Vol 5, No 3+4, pp. 45

Forum Posts

1989

- [Valvo-DT Match: Move 46](#) by [Mike Valvo](#), [rec.games.chess](#), March 30, 1989
- [Challenge Match](#) by [Mike Valvo](#), [rec.games.chess](#), March 31, 1989
- [Valvo-DT Match: Move 48](#) by [Mike Valvo](#), [rec.games.chess](#), April 01, 1989
- [World Computer Chess Championship \(the human side\)](#) by [Feng-hsiung Hsu](#), [rec.games.chess](#), June 04, 1989 » [WCCC 1989](#)
- [DT - Kasparov : 0-2](#) by [Peter Jansen](#), [rec.games.chess](#), October 23, 1989 » [Kasparov versus Deep Thought 1989](#)
- [Levy - DT match \(1\)](#) by [Peter Jansen](#), [rec.games.chess](#), December 22, 1989 » [Levy versus Deep Thought 1989](#)
- [Levy - DT match \(2\)](#) by [Peter Jansen](#), [rec.games.chess](#), December 22, 1989
- [Levy - DT match \(3\)](#) by [Peter Jansen](#), [rec.games.chess](#), December 23, 1989
- [Levy - DT match \(4\)](#) by [Peter Jansen](#), [rec.games.chess](#), December 23, 1989

1990 ...

- [Karpov-DT Match, Face to Screen](#) by [Feng-hsiung Hsu](#), [rec.games.chess](#), February 04, 1990
- [Deep Thought](#) by Thorsten Heedt, [rec.games.chess](#), April 11, 1995

2000 ...

- [Deep Thought's tuning code and eval function!](#) by [Severi Salminen](#), [CCC](#), September 05, 2000 » [Eval Tuning in Deep Thought](#)
- [Test Position = GM Tony Miles vs Deep Thought, 1989 \[14...Bxh2!!\]](#) by [José Antônio Fabiano Mendes](#), [CCC](#), September 09, 2004

External Links

- [Deep Thought from Wikipedia](#)

- [Deep Thought's ICGA Tournaments](#)
 - [Deep Thought's games from chessgames.com](#)
 - [Deep Thought from Tim Mann's Chess Pages](#)
- [Source code to tune Deep Thought's evaluation](#) in tar.gz format.
[Andreas Nowatzky's explanations of the the source code](#)

References

1. [^ The Hitchhiker's Guide to the Galaxy from Wikipeddia](#)
2. [^ Deep Thought I circuit board ca. 1988](#) Photo by [Feng-hsiung Hsu](#) from [The Computer History Museum](#)
3. [^ Deep Thought team with Fredkin Intermediate Prize](#) 1988, Gift of [Feng-hsiung Hsu](#) from [The Computer History Museum](#)
4. [^ Hans Berliner \(1989\)](#). *Deep Thought Wins Fredkin Intermediate Prize*. AI Magazine Volume 10 Number 2, [pdf](#)
5. [^ Aegon Tournament 1990; Hitech best overall](#) by [Hans Berliner](#), [rec.games.chess](#), May 25, 1990
6. [^](#) from [Kasparov versus Deep Thought 1989 documentary](#), Video 2, 10:49
7. [^](#) from [Kasparov versus Deep Thought 1989 documentary](#), Video 2, 13:35
8. [^ Karpov vs. DEEP THOUGHT Cambridge, Massachusetts reported by Darren Bedwell](#), [Compuserve 73](#)
9. [^ CeBIT, Hannover 1991 - 365Chess.com Tournaments](#)
10. [^ 12. IJCAI 1991](#) and [Deep Thought vs. Darryl Johansen](#) 1-1, [Sydney](#), August 28, 1991
11. [^ Deep Thought vs. Darryl K. Johansen](#) from [chessgames.co](#)

What links here?

Page	Date Edited
ACM 1988	Dec 5, 2017
ACM 1989	Jun 7, 2016
ACM 1990	Jun 7, 2016
ACM 1991	Nov 25, 2017
ACM 1994	May 5, 2017
ACM North American Computer Chess Championship	Jun 13, 2015
Alvin M. Despain	Feb 17, 2015
Andreas Nowatzky	Feb 6, 2014
Automated Tuning	Feb 27, 2018
Belle	Jan 18, 2018
Berkeley Chess Microprocessor	May 22, 2013
Brutus	Dec 24, 2016
Carnegie Mellon University	Feb 12, 2018
CC Sapiens	Oct 29, 2014
Chess Challenger	Dec 27, 2017
ChipTest	Jun 19, 2016
Claude Shannon	Apr 30, 2016

Page	Date Edited
Computers, Chess, and Cognition	Dec 28, 2016
Connection Machine	Oct 12, 2016
David Bronstein	Oct 28, 2014
Deep Blue	Aug 1, 2017
Deep Thought	Dec 5, 2016
Edward Fredkin	Oct 27, 2013
Engines	Mar 10, 2018
Eval Tuning in Deep Thought	Jun 7, 2016
Feng-hsiung Hsu	Dec 27, 2016
Fernand Gobet	May 11, 2017
Ferret	Jan 7, 2016
Fidelity Electronics	Dec 1, 2017
FPGA	Jul 9, 2016
Frederic Friedel	Jan 6, 2018
Gazebo	May 21, 2017
Hardware	Jan 20, 2018
Harvard Cup	Jan 11, 2013
Harvard Cup 1989	Oct 14, 2015
Herbert Simon	Feb 11, 2016
History	Jan 2, 2018
ICGA Journal	Dec 21, 2017
Internal Iterative Deepening	Feb 5, 2018
James Testa	Feb 17, 2015
Joe Hoane	Jan 7, 2016
José Antônio Fabiano Mendes	Feb 25, 2014
Kasparov versus Deep Thought 1989	Mar 26, 2017
L. Stephen Coles	Jan 5, 2017
Levy versus Deep Thought 1989	Jun 2, 2015
Mate Threat Extensions	Apr 14, 2012
Mathematician	Apr 9, 2018
Mephisto	Dec 18, 2017
Mephisto Almeria	Sep 1, 2017
Mephisto Lyon	Sep 1, 2017
Mephisto Portorose	Sep 1, 2017
Michael Valvo	Feb 26, 2018
Mike Browne	May 7, 2013
Murray Campbell	Jun 2, 2017
Netherlands-vs-Computers-1989	Mar 10, 2017
Opponent Model Search	Aug 14, 2017
Paul Hsieh	Aug 14, 2015
Peter Jansen	Jan 31, 2016
Robert Levinson	Aug 25, 2016
Scientific American	Jun 5, 2017
Shannon Trophy	Jul 7, 2017
Sidney Samole	Dec 27, 2017

Page	Date Edited
Singular Extensions	Jan 9, 2018
Sun	Jun 7, 2016
Terra	Feb 11, 2015
Test-Positions	Feb 25, 2018
Thomas Anantharaman	Jan 27, 2016
Tim Mann	Nov 5, 2016
Volker Annuss	Aug 3, 2017
WCCC 1989	Dec 5, 2017
World Computer Chess Championship	Mar 6, 2018
Zarkov	Feb 26, 2018
Zerker	Jun 9, 2016

[Up one Level](#)