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Paradise, (**P**attern recognition a pplied to **d**irecting search) a [knowledge](#) based chess program written at [Stanford University](#) in the late 70s by [David Wilkins](#). Paradise was written in [MacLisp](#), a dialect of the [Lisp](#) programming language developed at [MIT](#) within [Project MAC](#). Paradise' goal was to find the [best move](#) in [tactically](#) sharp [middlegame positions](#) from the [game](#) of chess masters.

Like human players, the program had a large number of stored "patterns", and analyzing a position involved matching these patterns to suggest [plans](#) for attack or defense. By communicating plans down the [tree](#), the analysis was verified and possibly corrected by a small [search](#) of the game tree (tens of positions) including specialized causality facility and [quiescence search](#) ^[1]. There were production rules to produce plans, implementing such concepts as [checkmate](#), [fork](#), [skewer](#), and [trapping](#) the piece, etc.. A plan generator produced tactical plans in a Plan Language. The program is capable of finding very deep combinations because no limit is placed on its search depth. It searches for moves as long as a plan is continuing to work ^[2].

While Paradise was able to solve most of 92 positions picked from the first 100 from [Win at Chess](#), with averaged three minutes thirty-three seconds for each solved position on a [PDP-10](#) ^[3], it was not able to play a complete reasonable

Paradise by [Jan Brueghel the Younger](#) ^[4]

game of chess due not further implemented knowledge employable in [strategic](#), none-tactical positions, especially during the [endgame](#). Controlling the search by [recognizers](#), i.e. the amount to [extend](#) or to [reduce](#) if a move is accordant to a plan or not is still hot topic.

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Publications

^[5]

- [David Wilkins](#) (1979). *Using Patterns and Plans to Solve Problems and Control Search*. Ph.D. thesis,

Computer Science Dept, [Stanford University](#), AI Lab Memo AIM-329

- [David Wilkins](#) (1980). *Using patterns and plans in chess*. [Artificial Intelligence](#), vol. 14, pp. 165-203. Reprinted (1988) in [Computer Chess Compendium](#)
- [David Wilkins](#) (1982). *Using Knowledge to Control Tree Searching*. [Artificial Intelligence](#), vol. 18, pp. 1-51.
- [David Wilkins](#) (1983). *Using chess knowledge to reduce search*. In [Chess Skill in Man and Machine](#) ([Peter W. Frey](#), ed.), Ch. 10, 2nd Edition, Springer-Verlag.
- [Tony Marsland](#) (1987). *Computer Chess Methods*. Encyclopedia of Artificial Intelligence (ed. S. Shapiro). John Wiley & sons, New York. [pdf draft](#), mentions Paradise on pp. 27
- [David Wilkins](#) (1991). *Working notes on Paradise chess patterns*. Technical Note 509, AI Center, SRI International, 333 Ravenswood Ave., Menlo Park, CA 94025, [pdf](#)
- [Jussi Tella](#) (1997). [Planning in Games](#). Seminar on Knowledge Engineering, Fall 1997, [Helsinki University of Technology](#)
- [Eric B. Baum](#) (2004). [What is Thought?](#) Bradford Book, ISBN-13: 978-0262025485, Paradise mentioned at pp. 193
- [Tristan Caulfield](#) (2004). *Acquiring and Using Knowledge in Computer Chess*. BSc Computer Science, [University of Bath](#), [pdf](#), 4.2.2 PARADISE, pp. 12
- [Diego Rasskin-Gutman](#) (2009). [Chess Metaphors - Artificial Intelligence and the Human Mind](#). ISBN-13: 978-0-262-18267-6, translated by [Deborah Klosky](#), [MIT Press](#), 5 Chess Metaphors: Searches and Heuristics, pp. 125, Paradise pp. 136

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- [Marcus Miller - Blast, Paradiso, Amsterdam](#) 2007, [YouTube](#) Video
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1. [^](#) [Comparison: Paradise and Symbolic](#) by [Steven Edwards](#), [CCC](#), February 13, 2004
2. [^](#) [Tristan Caulfield](#) (2004). *Acquiring and Using Knowledge in Computer Chess*. BSc Computer

Science, [University of Bath](#), [pdf](#), 4.2.2 PARADISE, pp. 12

3. [^ Re: Paradise performance](#) by [Steven Edwards](#), [CCC](#), August 22, 2003

4. [^ Paradise](#) by [Jan Brueghel the Younger](#) (c. 1620). Oil on oak. [Gemäldegalerie, Berlin](#), [Paradise from Wikipedia](#)

5. [^ Papers on Chess by David E. Wilkins](#)

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