

Chess Skill in Man and Machine

Chess Skill in Man and Machine

Edited by
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This volume is dedicated to my wife, Ruth, and my family, and to my colleagues whose contributions made this volume possible. I am especially indebted to David Slate whose comments and suggestions greatly improved the final version of this book.

Preface

Ten years of intensive effort on computer chess have produced notable progress. Although the background information and technical details that were written in 1975 for the first edition of this book are still valid in most essential points, hardware and software refinements have had a major impact on the effectiveness of these ideas. The current crop of chess machines are performing at unexpectedly high levels. The approach epitomized by the series of programs developed by David Slate and Larry Atkin at Northwestern in the middle 1970s (i.e., a sophisticated search algorithm using very little chess knowledge) was expected to reach an asymptotic level of performance no higher than that of a class A player (USCF rating between 1800 and 2000). This perspective was argued quite vigorously by Eliot Hearst in Chapter 8 of the first edition and was held at that time by many chess experts. Subsequent events have clearly demonstrated that the asymptotic performance level for this type of program is at least as high as the master level (USCF rating between 2200 and 2400). Current discussions now focus upon whether the earlier reservations were wrong in principle or simply underestimated the asymptote. If there is a real barrier which will prevent this type of program from attaining a world championship level of performance, it is not evident from the steady progress which has been observed during the last decade.

The second edition of *Chess Skill in Man and Machine* includes new material highlighting recent developments. A newly added Appendix includes a summary of recent games selected by David Slate which characterize the current level of achievement in machine chess. In addition, the new appendix provides information about the International Computer Chess Association, the establishment of several major prizes for chess programs, and developments in microcomputer chess. The bibliography has also been greatly expanded.

The second edition also keeps pace with the development of new ideas with the addition of two chapters. These chapters extend the debate ini-

Preface

tiated by their predecessors concerning the relative merits of search-based and knowledge-based programs. In Chapter 9, Ken Thompson and Joe Condon describe the architecture and inner workings of Belle, the current world champion and the most effective example of a search-intensive program. In Chapter 10, David Wilkins provides information about his program, PARADISE, which is currently the most impressive example of a knowledge-intensive chess program. PARADISE solves deep tactical positions by using a highly focused search. The different approach used by these two programs is emphasized by the number of nodes each examines in analyzing a position. PARADISE generates several hundred nodes, while Belle generates more than ten million. The ideas expressed in these new chapters provide two fascinating perspectives on an issue which is crucial to further developments in computer chess. In its general form, this issue has important ramifications for the entire field of artificial intelligence and will be the subject of active debates for many years.

Evanston, Illinois
May, 1982

PETER W. FREY

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