

a corresponding reduction of the problem will be needed in order to solve the 4×4 case on present-day computing machines.

The computer that was used to obtain these results was Maniac II at Los Alamos. This computer has

16,384 words of storage, a word being 48 bits in length. This computer has an add time of 19 microseconds, a multiply time of 160 microseconds, a divide time of 425 microseconds, and a shift time of $10 + 1.8$ times the number of shifts in microseconds.

References

- FALKENER, EDWARD (1961). *Games Ancient and Oriental and How to Play Them*, Dover, New York.
- GOODELL, JOHN D. (1957). *The Game of Ki*, Riverside Research Press, St. Paul, Minnesota.
- LASKER, EDWARD (1960). *Go and Go-Moku, the Oriental Board Games*, Dover, New York.
- MORRIS, LESTER and ELISABETH (1951). *The Game of Go*, American Go Association, New York.
- REMUS, H. (1962). "Simulation of a Learning Machine for Playing Go," Proc. IFIP Congress 62, Munich, North Holland Publishing Company, Amsterdam, pp. 192–194.
- ROSENTHAL, GILBERT (1954). *13 Line Go*, published by author, 4009 Liberty Heights Avenue, Baltimore, Md.
- SMITH, ARTHUR (1956). *The Game of Go*, Charles E. Tuttle Co., Rutland, Vermont.
- TAKAGAWA, KAKU (1958). *How to Play Go*, American Go Association.
- (1958). *The Vital Points of Go*, American Go Association.

Book Review

An Approach to Machine Intelligence, by MICHAEL J. PEDELTY, 1963; 125 pages. (London: Cleaver-Hume Press, 52s.)

This book, claims the author, "has as its domain the 'no man's land' between Cybernetic Systems . . . and Psychological and Physiological Systems." On reading the book, this does not appear to be entirely true as it is divided into two distinct parts. The first part deals with machine intelligence *in abstracto* and the second is concerned with some mechanisms which may provide a means for the realization of machine intelligence. No actual realization of machine intelligence is described.

The first two chapters introduce the topic of machine intelligence and describe some of the required properties of an intelligent machine. The following two chapters introduce the basic principles of information theory and the nature of the "information interface" through which an intelligent machine gains information about and influences its environment. These four chapters constitute the first part of the book. Although they provide a good introduction to the properties expected of an intelligent machine, they must be read carefully and preferably in conjunction with the given references if the important points are not to be missed. This results from a tendency to compress too much information into too little space.

Chapter 5 contains an introduction to the properties of real nerve cells and also devices called "neuromimes" which mimic the properties of real neurons. In Chapter 6, the manner in which neuromimes may be connected to build circuits to perform simple logical functions is described. Mention is made of the error-correcting capabilities of such circuits. A section of the Appendix entitled "Physical and Functional Realizability" is included which relates such circuits to the theory of automata. It is a pity that the first part of the book is hardly referred to in these sections.

Also included in the Appendix are brief descriptions of the salient features of set theory, lattice theory and partitioning. These sections enable the reader with only a partial knowledge of these topics to follow the main text with little or no difficulty.

This is the first book (other than papers and similar publications) to be published on the subject of machine intelligence. The quality of the printing and diagrams was found adequate and no misprints other than those corrected by an errata slip were discovered. In spite of the fact that an intelligent machine is not actually described, the author's style and his use of illustrative examples make the book very readable.

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