

systems does seem to aid in developing physical intuition in a simpler way than through the use of elaborate laboratory experiments. Later sections of the book discuss more general systems of computer-aided instruction, and these sections are much less physics-dependent than the earlier ones. However, most of the interesting CAI systems have been discussed elsewhere in more detail. I did get the distinct impression that CAI systems have managed to become cost-effective, and that their use will be spreading in colleges and universities. A final section of the book deals with the political problems of computing at universities, and with the prognoses for the future.

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41 [13.35].—I. H. MUFTI, *Computational Methods in Optimal Control Problems*, Springer-Verlag, New York, 1970, 45 pp., 26 cm. Price \$1.70.

This short monograph is a member of the series, *Lecture Notes in Operations Research and Mathematical Systems*, edited by M. Beckmann and H. P. Kunzi. The author accomplishes his stated purpose of presenting in a concise manner the major points of several computational methods for solving certain optimal control problems. Each method discussed is iterative and uses successive linearization to obtain functions that are solutions of a set of necessary conditions of optimality associated with the given problem. These conditions consist of a set of algebraic and differential equations and inequalities (called the minimum principle of Pontryagin) that any optimal solution of the given problem must satisfy.

The reader is assumed to possess more than a passing acquaintance with variational calculus; no general explanatory comments are included. Algorithms for the solution of problems with no state or control constraints are presented first, progressing to problems with control constraints and 'terminal' state constraints. Problems in which the state trajectories must remain in a set not equal to the entire space are not considered.

This report contains no statements regarding the advantages or disadvantages of any of the methods discussed, and there are no examples or exercises. A good reference for such comments and examples is *Applied Optimal Control* by A. E. Bryson, Jr. and Y. C. Ho, Blaisdell Publishing Co., 1969, Chapter 7.

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