<u>The Mathematical Theory of Optimal Processes</u>, by L. S. Pontryagin, V. G. Boltyanskii, R. V. Gamkrelidze, and E. F. Mishchenko. Authorized Translation from the Russian. Translator: K. N. Trirogoff, Editor: L. W. Neustadt. Interscience Publishers (division of John Wiley and Sons, Inc., New York) 1962. viii + 360 pages.

The present book makes available under one cover the important work in optimal control undertaken by Pontryagin and his co-workers at the Stiklov Mathematical Institute in Moscow.

The so-called "maximum principle", which gives a necessary condition for optimality, is expounded with great care in the first chapter, and some elementary, but informative, examples are worked out in considerable detail. The second chapter is devoted to a proof of the maximum principle, in a more general setting than that stated in Chapter 1. The important case of linear time-optimal controls is treated quite substantially in the next chapter. After a chapter on miscellaneous problems (including processes with parameters, processes with a delay, and a pursuit problem) there are three chapters on the maximum principle and the calculus of variations, optimal processes with restricted phase coordinates, and statistical optimal processes.

The first chapter can be read with profit by anyone with a modest knowledge of classical analysis. However, for the remainder, the pre-requisites are more severe: some familiarity with Lebesgue integration, Hilbert spaces and linear algebra is required. The novice to the subject will find the going rather rough in places. For the specialist, the book is indispensable.

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