A TEXT-BOOK ON THE METHOD OF LEAST SQUARES

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649129812

A text-book on the method of least squares by Mansfield Merriman

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

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MANSFIELD MERRIMAN

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METHOD OF LEAST SQUARES.

BY

MANSFIELD MERRIMAN,

MEMBER OF AMERICAN MATHEMATICAL SOCIETY.

EIGHTH EDITION, REVISED

TOTAL ISSUE, SIXTH THOUSAND.

NEW YORK:

JOHN WILEY & SONS.

LONDON: CHAPMAN & HALL, LIMITED.

1910

The Scientific Press
Robert Drummond and Company
New York

PREFACE TO THE FIRST EDITION.

The "Elements of the Method of Least Squares," published in 1877, was written with two objects in view: first, to present the fundamental principles and processes of the subject in so plain a manner, and to illustrate their application by such simple and practical examples, as to render it accessible to civil engineers who have not had the benefit of extended mathematical training; and, secondly, to give an elementary exposition of the theory which would be adapted to the needs of a large and constantly increasing class of students.

In preparing the following pages the author has likewise kept these two objects continually in mind. While the former work has been used as a basis, the alterations and additions have been so numerous and radical as to render this a new and distinct book rather than a second edition. The arrangement of the theoretical and practical parts is entirely different. In Chapters I to IV is presented the mathematical development of the principles, methods, and formulas; while in Chapters V to IX the application of these

to the different classes of observations is made, and illustrated by numerous practical examples. For the use of both students and engineers, it is believed that this plan will prove more advantageous than the one previously followed. Hagen's deduction of the law of probability of error is given, as well as that of Gauss. More attention is paid to the laws of the propagation of error, the solution of normal equations, and the deduction of empirical formulas. Many new illustrative examples of the adjustment and comparison of observations have been selected from actual practice, and are discussed in detail. At the end of each chapter are given a few problems or queries; and in the Appendix are eight tables for abridging computations.

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NOTE TO THE EIGHTH EDITION.

The seventh edition was the result of a thorough revision and was enlarged by the addition of new matter on the solution of normal equations, on the uncertainty of the propable error, and on the median. In this edition all known errors have been corrected and an alphabetical index has been added.

M. M.

32 WEST FORTIETH STREET, NEW YORK.

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