Big Data and Differential Privacy: Analysis Strategies for Railway Track Engineering
Nii O. Attoh-Okine

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**DESCRIPTION**

A comprehensive introduction to the theory and practice of contemporary data science analysis for railway track engineering

Featuring a practical introduction to state-of-the-art data analysis for railway track engineering, *Big Data and Differential Privacy: Analysis Strategies for Railway Track Engineering* addresses common issues with the implementation of big data applications while exploring the limitations, advantages, and disadvantages of more conventional methods. In addition, the book provides a unifying approach to analyzing large volumes of data in railway track engineering using an array of proven methods and software technologies.

Dr. Attoh-Okine considers some of today’s most notable applications and implementations and highlights when a particular method or algorithm is most appropriate. Throughout, the book presents numerous real-world examples to illustrate the latest railway engineering big data applications of predictive analytics, such as the Union Pacific Railroad’s use of big data to reduce train derailments, increase the velocity of shipments, and reduce emissions.

In addition to providing an overview of the latest software tools used to analyze the large amount of data obtained by railways, *Big Data and Differential Privacy: Analysis Strategies for Railway Track Engineering*:

- Features a unified framework for handling large volumes of data in railway track engineering using predictive analytics, machine learning, and data mining
• Explores issues of big data and differential privacy and discusses the various advantages and disadvantages of more conventional data analysis techniques

• Implements big data applications while addressing common issues in railway track maintenance

• Explores the advantages and pitfalls of data analysis software such as R and Spark, as well as the Apache™ Hadoop® data collection database and its popular implementation MapReduce

_Big Data and Differential Privacy_ is a valuable resource for researchers and professionals in transportation science, railway track engineering, design engineering, operations research, and railway planning and management. The book is also appropriate for graduate courses on data analysis and data mining, transportation science, operations research, and infrastructure management.

**NII ATTOH-OKINE, PhD, PE** is Professor in the Department of Civil and Environmental Engineering at the University of Delaware. The author of over 70 journal articles, his main areas of research include big data and data science; computational intelligence; graphical models and belief functions; civil infrastructure systems; image and signal processing; resilience engineering; and railway track analysis. Dr. Attoh-Okine has edited five books in the areas of computational intelligence, infrastructure systems and has served as an Associate Editor of various ASCE and IEEE journals.

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**ABOUT THE AUTHOR**

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