

Proceedings of the 2019 Meeting of the International  
Society for Data Science and Analytics

# New Developments in Data Science and Data Analytics

Zhiyong Zhang  
Ke-Hai Yuan  
Yong Wen  
Jiashan Tang

ISDSA Press · Granger, IN

Copyright © 2020 International Society for Data Science and Analytic

PUBLISHED BY ISDSA PRESS GRANGER, IN  
WWW.ISDSA.ORG

ISBN-13 (pbk): 978-1-946728-03-6  
ISBN-13 (E-book): 978-1-946728-04-3

This work is subject to copyright. All rights are reserved by the ISDSA Press and the authors, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from ISDSA Press. Violations are liable to prosecution under the respective Copyright Law.

Trademarked names, logos, and images may appear in this book. Rather than use a trademark symbol with every occurrence of a trademarked name, logo, or image we use the names, logos, and images only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark. The use in this publication of trade names, trademarks, service marks, and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

**Library of Congress Cataloging-in-Publication Data**

*Personal name:* Zhang, Zhiyong (Professor), author  
*Main title:* New Developments in Data Science and Data Analytics / Zhiyong Zhang, Ke-Hai Yuan, Yong Wen, and Jiashan Tang  
*Published/Produced:* ISDSA Press  
*LCCN:* 2019905671  
*LCCN Permalink:* <https://lcn.loc.gov/2019905671>

*First printing, May, 2020*