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Robust Latent Feature Learning for Incomplete Big Data

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Preface

In the era of Big Data, high dimensional and incomplete (HDI) data are frequently encountered in many industrial applications, such as recommender systems, the Internet of Things, intelligent transportation, cloud computing, and so on. It is of great significance to analyze them for mining rich and valuable knowledge and patterns. Latent feature learning is one of the most popular representation learning methods tailored for HDI data due to its high accuracy, computational efficiency, and ease of scalability. The crux of analyzing HDI data lies in addressing the uncertainty problem caused by their incomplete characteristics. However, existing HDI methods do not fully consider such uncertainty.

In this book, I introduce several robust latent feature learning methods to address such uncertainty for effectively and efficiently analyzing HDI data, including robust latent feature learning based on smooth L_1-norm, improving robustness of latent feature learning using L_1-norm, improving robustness of latent feature learning using double-space, data-characteristic-aware latent feature learning, posterior-neighborhood-regularized latent feature learning, and generalized deep latent feature learning.

This is the first book that can help researchers and engineers fully understand how to employ robust latent feature learning to effectively and efficiently analyze HDI data. It is assumed that readers have a basic knowledge of mathematics, as well as a certain background in data mining. Readers can obtain an overview of the challenges of analyzing HDI data. In addition, this book provides several algorithms and real application cases, which can help readers quickly build their robust latent feature learning models to analyze HDI data.

Chongqing, China Di Wu
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About the Author

Di Wu received a Ph.D. degree in Computer Science from Chongqing Institute of Green and Intelligent Technology, Chinese Academy of Sciences, Chongqing, China, in 2019. He was a visiting scholar from April 2018 to April 2019 at the University of Louisiana, Lafayette, USA. Currently, he is a Professor at the College of Computer and Information Science, Southwest University. His current research interests include data mining, artificial intelligence, and big data. He has published over 50 papers, including 12 IEEE TRANSACTIONS papers, three highly cited paper of ESI, and several top-tier conferences such as AAAI, ICDM, WWW, and IJCAI. His Google Scholar citations are more than 1800, and his H-Index is 23. He is an Associate Editor for Frontiers in Neurorobotics (SCI, IF 3.493). He received the Nomination Award for Excellent Doctoral Dissertation of the Chinese Association for Artificial Intelligence (CAAI).