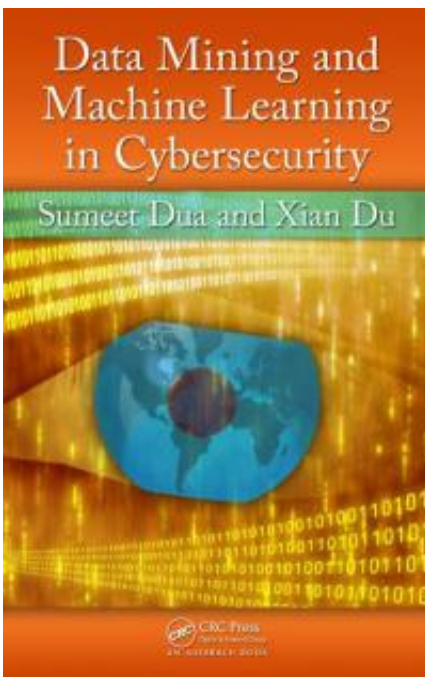# Louisiana Tech computer scientist pens first cyber data mining reference book

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This is the cover of "Data Mining and Machine Learning in Cybersecurity," by Sumeet Dua and Xian Du. Credit: Sumeet Dua

Dr. Sumeet Dua, the Upchurch Endowed Professor of Computer Science and coordinator of information technology research at Louisiana Tech University, has co-authored the first reference book focusing on cyber data mining and machine learning.

"Data Mining and Machine Learning in Cybersecurity," which Dua

authored with Dr. Xian Du, a senior research associate and postdoctoral fellow at Louisiana Tech, surveys cybersecurity problems and state-of-the-art machine-learning and data-mining solutions that address the overarching research problems. The book is designed for students and researchers studying or working on machine learning and data mining applications.

"'Data Mining and Machine Learning in Cybersecurity' is intended as a preliminary reference point for emerging researchers in this heavily interdisciplinary area," said Dua. "This book will provide them with an integrated, bottom-up view of the data-centered computational learning challenges in cybersecurity domains and help apportion this large problem into smaller underpinning data-mining and machine-learning research questions and their potential solutions."

Dua says numerous illustrative figures will help readers visualize the workflow of complex techniques, and more than forty case studies provide a clear proof-of-principle understanding of the design and application of data-mining and machine-learning techniques in cybersecurity.

According to the book's preface, in the emerging era of Web 3.0, securing cyberspace has gradually evolved into a critical organizational and national research agenda, inviting interest from a multidisciplinary scientific workforce. Machine learning and data mining play significant roles in cybersecurity, especially as more challenges appear with the rapid development of information discovery techniques.

Several conferences, workshops, and journals have focused on this research topic, however until the publication of Dua's book, there had not been a single interdisciplinary resource on past and current works and possible paths for future research in this area.

Dua says the inclusion of cybersecurity design principles in machine-learning research is important for academic research. "Such an inclusion inspires fundamental research in [machine learning](#) and data mining, such as research in the subfields of imbalanced learning, feature extraction for data with evolving characteristics, and privacy-preserving data mining."

In addition to this first-of-its-kind reference publication, Dua has also co-authored or edited books on data mining in biomedical imaging and bioinformatics, and computational analysis.

Dua earned his Ph.D. from Louisiana State University in Baton Rouge and has received numerous research awards from the State and Louisiana Tech including the 2007 Research Recognition Award and the 2009 Inventor Recognition Award. He is frequently invited to serve as a scientific review panelist for a variety of federal agencies and is a senior member of IEEE and the Association for Computing Machinery (ACM).

Dua's areas of expertise include data mining, image processing and computational decision support, pattern recognition, data warehousing, biomedical informatics, and heterogeneous distributed data integration.

Provided by Louisiana Tech University