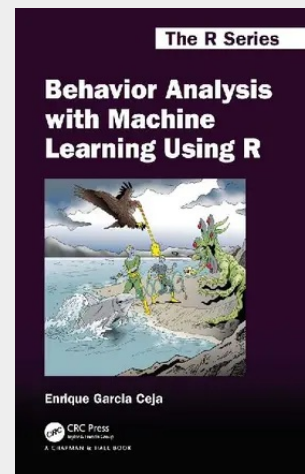


Behavior Analysis with Machine Learning Using R

Behavior Analysis with Machine Learning Using R introduces machine learning and deep learning concepts and algorithms applied to a diverse set of behavior analysis problems. It focuses on the practical aspects of solving such problems based on data collected from sensors or stored in electronic records. The included examples demonstrate how to perform common data analysis tasks such as: data exploration, visualization, preprocessing, data representation, model training and evaluation. All of this, using the R programming language and real-life behavioral data. Even though the examples focus on behavior analysis tasks, the covered underlying concepts and methods can be applied in any other domain. No prior knowledge in machine learning is assumed. Basic experience with R and basic knowledge in statistics and high school level mathematics are beneficial. Features: - Build supervised machine learning models to predict indoor locations based on WiFi signals, recognize physical activities from smartphone sensors and 3D skeleton data, detect hand gestures from accelerometer signals, and so on. - Program your own ensemble learning methods and use Multi-View Stacking to fuse signals from heterogeneous data sources. - Use unsupervised learning algorithms to discover criminal behavioral patterns. - Build deep learning neural networks with TensorFlow and Keras to classify muscle activity from electromyography signals and Convolutional Neural Networks to detect smiles in images. - Evaluate the performance of your models in traditional and multi-user settings. - Build anomaly detection models such as Isolation Forests and autoencoders to detect abnormal fish behaviors. This book is intended for undergraduate/graduate students and researchers from ubiquitous computing, behavioral ecology, psychology, e-health, and other disciplines who want to learn the basics of machine learning and deep learning and for the more experienced individuals who want to apply machine learning to analyze behavioral data.

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