

Human Activity Recognition Using Wearable Sensors And Smartphones Chapman Hallcrc Computer And Information Science Series

Intelligent Data Engineering and Analytics
 Human Activity Recognition Using Wearable Sensors
 Activity and Behavior Computing
 Adaptive Human Activity Recognition and Fall Detection Using Wearable Sensors
 2018 IEEE ACM International Conference on Computer Aided Design (ICCAD)
 Analysis of Subtle Human Activity Recognition Using Wearable Sensors
 Advances in Practical Applications of Survivable Agents and Multi-Agent Systems: The PAAMS Collection
 Location- and Context-Awareness
 Human Activity Sensing
 On the Automatic Recognition of Human Activities Using Heterogeneous Wearable Sensors
 Handbook of Research on ICTs for Human-Centered Healthcare and Social Care Services
 Planetary Navigation Activity Recognition Using Wearable Accelerometer Data
 Human Activity Recognition
 Technologies for Smart Sensors and Sensor Fusion
 Artificial Neural Networks and Machine Learning -- ICANN 2014
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Intelligent Data Engineering and Analytics Springer

This book offer clear descriptions of the basic structure for the recognition and classification of human activities using different types of sensor module and smart devices in e.g. healthcare, education, monitoring the elderly, daily human behavior, and fitness monitoring. In addition, the complexities, challenges, and design issues involved in data collection, processing, and other fundamental stages along with datasets, methods, etc., are discussed in detail. The book offers a valuable resource for readers in the fields of pattern recognition, human-computer interaction, and the Internet of Things.

Human Activity Recognition Using Wearable Sensors World Scientific

nd Welcome to the proceedings of PERVASIVE 2004, the 2 International Conference on Pervasive Computing and the premier forum for the presentation and appraisal of the most recent and most advanced research results in all - undational and applied areas of pervasive and ubiquitous computing. Consi- ring the half-life period of technologies and knowledge this community is facing, PERVASIVE is one of the most vibrant, dynamic, and evolutionary among the computer-science-related symposia and conferences. The research challenges, e?orts, and contributions in pervasive computing have experienced a breathtaking acceleration over the past couple of years, mostly due to technological progress, growth, and a shift of paradigms in c- puter science in general. As for technological advances, a vast manifold of tiny, embedded, and autonomous computing and communication systems have st- ted to create and populate a pervasive and ubiquitous computing landscape, characterized by paradigms like autonomy, context-awareness, spontaneous - teraction, seamless integration, self-organization, ad hoc networking, invisible services, smart artifacts, and everywhere interfaces. The maturing of wireless networking, miniaturized information-processing possibilities induced by novel microprocessor technologies, low-power storage systems, smart materials, and technologies for motors, controllers, sensors, and actuators envision a future computing scenario in which almost every object in our everyday environment will be equipped with embedded processors, wireless communication facilities, and embedded software to perceive, perform, and control a multitude of tasks and functions.

Activity and Behavior Computing Eliva Press

Learn How to Design and Implement HAR Systems The pervasiveness and range of capabilities of today's mobile devices have enabled a wide spectrum of mobile applications that are transforming our daily lives, from smartphones equipped with GPS to integrated mobile sensors that acquire physiological data. Human Activity Recognition: Using Wearable Sensors and Smartphones focuses on the automatic identification of human activities from pervasive wearable sensors—a crucial component for health monitoring and also applicable to other areas, such as entertainment and tactical operations. Developed from the authors' nearly four years of rigorous research in the field, the book covers the theory, fundamentals, and applications of human activity recognition (HAR). The authors examine how machine learning and pattern recognition tools help determine a user's activity during a certain period of time. They propose two systems for performing HAR: Centinela, an offline server-oriented HAR system, and Vigilante, a completely mobile real-time activity recognition system. The book also provides a practical guide to the development of activity recognition applications in the Android framework.

Adaptive Human Activity Recognition and Fall Detection Using Wearable Sensors Springer

The book constitutes the proceedings of the 24th International Conference on Artificial Neural Networks, ICANN 2014, held in Hamburg, Germany, in September 2014. The 107 papers included in the proceedings were carefully reviewed and selected from 173 submissions. The focus of the papers is on following topics: recurrent networks; competitive learning and self-organisation; clustering and classification; trees and graphs; human-machine interaction; deep networks; theory; reinforcement learning and action; vision; supervised learning; dynamical models and time series; neuroscience; and applications.

Springer Nature

In this work, an intelligent human-machine interface (HMI) for human worker activity recognition in industrial environments is presented. The interface consists of components for robust and accurate 3D position estimation in workspace environments, the recognition of task-related worker activities and human-computer interaction via gestures. All components of the presented HMI are flexible with respect to applications and can be transferred to other activity recognition problems, as well.

2018 IEEE ACM International Conference on Computer Aided Design (ICCAD) IGI Global
 Focusing on the vision-based and sensor-based recognition and analysis of human activity and behavior, this book gathers extended versions of selected papers presented at the International Conference on Activity and Behavior Computing (ABC 2020), held in Kitakyushu, Japan on August 26 - 29, 2020. The respective chapters cover action recognition, action understanding, gait analysis, gesture recognition, behavior analysis, emotion and affective computing, and related areas. The book addresses various challenges and aspects of human activity recognition in both the sensor-based and vision-based domains, making it a unique guide to the field.

Analysis of Subtle Human Activity Recognition Using Wearable Sensors Springer

This book provides a unique view of human activity recognition, especially fine-grained human activity structure learning, human-interaction recognition, RGB-D data based action recognition, temporal decomposition, and causality learning in unconstrained human activity videos. The techniques discussed give readers tools that provide a significant improvement over existing methodologies of video content understanding by taking advantage of activity recognition. It links multiple popular research fields in computer vision, machine learning, human-centered computing, human-computer interaction, image classification, and pattern recognition. In addition, the book includes several key chapters covering multiple emerging topics in the field. Contributed by top experts and practitioners, the chapters present key topics from different angles and blend both methodology and application, composing a solid overview of the human activity recognition techniques.

Advances in Practical Applications of Survivable Agents and Multi-Agent Systems: The PAAMS Collection Springer Nature

This book constitutes the refereed proceedings of the First International Workshop on Human Behavior Understanding, HBU 2010, a satellite workshop of the International Conference on Pattern Recognition in Istanbul, Turkey, on August 22, 2010. The 13 revised full papers presented were carefully reviewed and selected from 29 submissions. The papers are organized in topical sections on analysis of human activities; non-verbal action dynamics; visual action recognition; and social signals.

Location- and Context-Awareness CRC Press

Understanding the behavior of groups or crowds in real time can provide valuable information to crowd management systems, helping prevent or avoid human tragedy in crowd emergencies. Wearable devices provide a powerful platform for understanding human behavior, however the infrastructure required to communicate data from these devices is often the first casualty in

emergency situations. Peer-to-peer (P2P) methods for recognizing group behavior are therefore necessary, but the behavior of the group cannot be observed at any single location, creating an intriguing problem. This dissertation provides the tools to (1) understand which information is best for behavior recognition, (2) to detect different groups who may be in the same environment, and (3) to recognize the physical behavior or activities of the group, all in a P2P fashion. Furthermore, all of this is done while (4) respecting the limited resources and primary functions of the sensing devices, e.g. wearables and mobile phones. The combined contribution of this dissertation is the knowledge, algorithms and methods necessary for recognition of group behavior using only the wearable devices of its constituents.

Human Activity Sensing Springer Nature

This book gathers the proceedings of the 8th International Conference on Frontiers of Intelligent Computing: Theory and Applications (FICTA 2020), held at NIT Surathkal, Karnataka, India, on 4-5 January 2020. In these proceedings, researchers, scientists, engineers and practitioners share new ideas and lessons learned in the field of intelligent computing theories with prospective applications in various engineering disciplines. The respective papers cover broad areas of the information and decision sciences, and explore both the theoretical and practical aspects of data-intensive computing, data mining, evolutionary computation, knowledge management and networks, sensor networks, signal processing, wireless networks, protocols and architectures. Given its scope, the book offers a valuable resource for graduate students in various engineering disciplines.

On the Automatic Recognition of Human Activities Using Heterogeneous Wearable Sensors Springer Nature

The papers in this proceeding discuss current and future trends in wearable communications and personal health management through the use of wireless body area networks (WBAN). The authors posit new technologies that can provide trustworthy communications mechanisms from the user to medical health databases. The authors discuss not only on-body devices, but also technologies providing information in-body. Also discussed are dependable communications combined with accurate localization and behavior analysis, which will benefit WBAN technology and make the healthcare processes more effective. The papers were presented at the 13th EAI International Conference on Body Area Networks (BODYNETS 2018), Oulu, Finland, 02-03 October 2018.

Handbook of Research on ICTs for Human-Centered Healthcare and Social Care Services MDPI

This book offers a systematic, comprehensive, and timely review on V-HAR, and it covers the related tasks, cutting-edge technologies, and applications of V-HAR, especially the deep learning-based approaches. The field of Human Activity Recognition (HAR) has become one of the trendiest research topics due to the availability of various sensors, live streaming of data and the advancement in computer vision, machine learning, etc. HAR can be extensively used in many scenarios, for example, medical diagnosis, video surveillance, public governance, also in human-machine interaction applications. In HAR, various human activities such as walking, running, sitting, sleeping, standing, showering, cooking, driving, abnormal activities, etc., are recognized. The data can be collected from wearable sensors or accelerometer or through video frames or images; among all the sensors, vision-based sensors are now the most widely used sensors due to their low-cost, high-quality, and unintrusive characteristics. Therefore, vision-based human activity recognition (V-HAR) is the most important and commonly used category among all HAR technologies. The addressed topics include hand gestures, head pose, body activity, eye gaze, attention modeling, etc. The latest advancements and the commonly used benchmark are given. Furthermore, this book also discusses the future directions and recommendations for the new researchers.

Planetary Navigation Activity Recognition Using Wearable Accelerometer Data Springer

This book presents the latest developments in both qualitative and quantitative computational methods for reliability and statistics, as well as their applications. Consisting of contributions from active researchers and experienced practitioners in the field, it fills the gap between theory and practice and explores new research challenges in reliability and statistical computing. The book consists of 18 chapters. It covers (1) modeling in and methods for reliability computing, with chapters dedicated to predicted reliability modeling, optimal maintenance models, and mechanical reliability and safety analysis; (2) statistical computing methods, including machine learning techniques and deep learning approaches for sentiment analysis and recommendation systems; and (3) applications and case studies, such as modeling innovation paths of European firms, aircraft components, bus safety analysis, performance prediction in textile finishing processes, and movie recommendation systems. Given its scope, the book will appeal to postgraduates, researchers, professors, scientists, and practitioners in a range of fields, including reliability engineering and management, maintenance engineering, quality management, statistics, computer science and engineering, mechanical engineering, business analytics, and data science.

Human Activity Recognition Springer Nature

A fascinating bird's eye view on a hugely relevant topic. This book constitutes the refereed proceedings of the 4th International Conference on Ubiquitous Intelligence and Computing held in Hong Kong, China in 2007, co-located with ATC 2007, the 4th International Conference on Autonomic and Trusted Computing. The 119 revised full papers presented together with 1 keynote paper and 1 invited paper were carefully reviewed and selected from 463 submissions. The papers are organized in topical sections.

Technologies for Smart Sensors and Sensor Fusion Springer Science & Business Media

The 4 volume set LNCS 12112-12114 constitutes the papers of the 25th International Conference on Database Systems for Advanced Applications which will be held online in September 2020. The 119 full papers presented together with 19 short papers plus 15 demo papers and 4 industrial papers in this volume were carefully reviewed and selected from a total of 487 submissions. The conference program presents the state-of-the-art R&D activities in database systems and their applications. It provides a forum for technical presentations and discussions among database researchers,

developers and users from academia, business and industry.

Artificial Neural Networks and Machine Learning -- ICANN 2014 Springer Nature

This book constitutes refereed proceedings of the Second International Workshop on Deep Learning for Human Activity Recognition, DL-HAR 2020, held in conjunction with IJCAI-PRICAI 2020, in Kyoto, Japan, in January 2021. Due to the COVID-19 pandemic the workshop was postponed to the year 2021 and held in a virtual format. The 10 presented papers were thoroughly reviewed and included in the volume. They present recent research on applications of human activity recognition for various areas such as healthcare services, smart home applications, and more.

Human Activity Recognition and Prediction Springer

FLINS, an acronym introduced in 1994 and originally for Fuzzy Logic and Intelligent Technologies in Nuclear Science, is now extended into a well-established international research forum to advance the foundations and applications of computational intelligence for applied research in general and for complex engineering and decision support systems. The principal mission of FLINS is bridging the gap between machine intelligence and real complex systems via joint research between universities and international research institutions, encouraging interdisciplinary research and bringing multidiscipline researchers together. FLINS 2020 is the fourteenth in a series of conferences on computational intelligence systems.

2020 IEEE 63rd International Midwest Symposium on Circuits and Systems (MWSCAS) CRC Press

This book provides a unified approach for developing a fuzzy classifier and explains the advantages and disadvantages of different classifiers through extensive performance evaluation of real data sets. It thus offers new learning paradigms for analyzing neural networks and fuzzy systems, while training fuzzy classifiers. Function approximation is also treated and function approximators are compared.

Deep Learning for Human Activity Recognition Springer Nature

In the past decade, Human Activity Recognition (HAR) has been an important part of the regular day to day life of many people. Activity recognition has wide applications in the field of health care, remote monitoring of elders, sports, biometric authentication, e-commerce and more. Each HAR application needs a unique approach to provide solutions driven by the context of the problem. In this dissertation, we are primarily discussing two application of HAR in different contexts. First, we design a novel approach for in-home, fine-grained activity recognition using multimodal wearable sensors on multiple body positions, along with very small Bluetooth beacons deployed in the environment. State-of-the-art in-home activity recognition schemes with wearable devices are mostly capable of detecting coarse-grained activities (sitting, standing, walking, or lying down), but cannot distinguish complex activities (sitting on the floor versus on the sofa or bed). Such schemes are not effective for emerging critical healthcare applications for example, in remote monitoring of patients with Alzheimer's disease, Bulimia, or Anorexia because they require a more comprehensive, contextual, and fine-grained recognition of complex daily user activities. Second, we introduced Watch-Dog a self-harm activity recognition engine, which attempts to infer self-harming activities from sensing accelerometer data using wearable sensors worn on a subject's wrist. In the United States, there are more than 35,000 reported suicides with approximately 1,800 of them being psychiatric inpatients every year. Staff perform intermittent or continuous observations in order to prevent such tragedies, but a study of 98 articles over time showed that 20% to 62% of suicides happened while inpatients were on an observation schedule. Reducing the instances of suicides of inpatients is a problem of critical importance to both patients and healthcare providers. Watch-dog uses supervised learning algorithm to model the system which can discriminate the harmful activities from non-harmful activities. The system is not only very accurate but also energy efficient. Apart from these two HAR systems, we also demonstrated the difference in activity pattern between elder and younger age group. For this experiment, we used 5 activities of daily living (ADL). Based on our findings we recommend that a context aware age-specific HAR model would be a better solution than all age-mixed models. Additionally, we find that personalized models for each individual elder person perform better classification than mixed models.

Sensors and Actuators in Smart Cities KIT Scientific Publishing

Activity recognition can be an important part of human health awareness. Many benefits can be generated from the recognition results, including knowledge of activity intensity as it relates to wellness over time. Various activity-recognition techniques have been presented in the literature, though most address simple activity-data collection and off-line analysis. More sophisticated real-time identification is less often addressed. Therefore, it is promising to consider the combination of current off-line, activity-detection methods with wearable, embedded tools in order to create a real-time wireless human activity recognition system with improved accuracy. Different from previous work on activity recognition, the goal of this effort is to focus on specific activities that an astronaut may encounter during a mission. Planetary navigation field test (PNFT) tasks are designed to meet this need. The approach used by the KSU team is to pre-record data on the ground in normal earth gravity and seek signal features that can be used to identify, and even predict, fatigue associated with these activities. The eventual goal is to then assess/predict the condition of an astronaut in a reduced-gravity environment using these predetermined rules. Several classic machine learning algorithms, including the k-Nearest Neighbor, Naïve Bayes, C4.5 Decision Tree, and Support Vector Machine approaches, were applied to these data to identify recognition algorithms suitable for real-time application. Graphical user interfaces (GUIs) were designed for both MATLAB and LabVIEW environments to facilitate recording and data analysis. Training data for the machine learning algorithms were recorded while subjects performed each activity, and then these identification approaches were applied to new data sets with an identification accuracy of around 86%. Early results indicate that a single three-axis accelerometer is sufficient to identify the occurrence of a given PNFT activity. A custom, embedded acceleration monitoring system employing ZigBee transmission is under development for future real-time activity recognition studies. A different GUI has been implemented for this system, which uses an on-line algorithm that will seek to identify activity at a refresh rate of 1 Hz.

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