2021 International Conference on Health Big Data and Smart Sports (HBDSS 2021)

Guilin, China
29 – 31 October 2021

IEEE Catalog Number: CFP21BK4-POD
ISBN: 978-1-6654-2189-8

Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP21BK4-POD
ISBN (Print-On-Demand): 978-1-6654-2189-8
ISBN (Online): 978-1-6654-2188-1

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2021 International Conference on Health Big Data and Smart Sports (HBDSS)

HBDSS 2021

Table of Contents

Preface ..... **xii**
Committee Members ..... **xiii**
Reviewers ..... **xiv**

Chapter 1. Health Big Data Mining Technology and Algorithm Application

Using GIS to Analyze the Spatial Distribution of Marathon Events: A Case Study Based on Taiwan Area 1
LuBi ShaPu (Nanning Normal University, China), YiChia Lin (Nanning Normal University, China), FangChun Sung (Nanning Normal University, China), and ShihLing Chen (Taiwan Normal University, China)

Research on American Professional Basketball League Based on Big Data Technology 5
Zhongpei Hu (Jiangxi University of Applied Science, China)

Research on the Mechanism of Physical Exercise Affecting Residents' Self-Rated Health: Empirical Analysis Based on CFPS2018 Data 9
Yanmei Dong (Nanjing Institute of Physical Education, China)

Construction of China's Sports Tourism Information Data Model Based on Big Data Technology..... 21
Yuhua Huang (Jiangxi Institute of Applied Science and Technology, China)

Research on the Application of Big Data Technology in Horse Racing Events 25
Xiaohe Feng (Macau Jockey Club, China)

Research on the Model Construction for Health Management Service of Community-Based Eldercare in the Big Data Era 29
Jian Dong (Guangdong Food and Drug Vocational College, China), Jianru Xie (Guangdong Polytechnic of Water Resources and Electric Engineering, China), Yintong Guo (Guangdong Food and Drug Vocational College, China), and Huashan Pan (Guangdong Food and Drug Vocational College, China)

Research and Discussion on Chinese Traditional Medicine Health Culture Literacy——Based on Visual Analysis of CiteSpace 34
Jing Li (Institute of Traditional Chinese Medicine and Health Development, China), Suzhen Wang (Institute of Traditional Chinese Medicine and Health Development, China), Jiameng Zhang (Institute of Traditional Chinese Medicine and Health Development, China), Meiling Feng (Institute of Traditional Chinese Medicine and Health Development, China), Yao Zhu (Institute of Traditional Chinese Medicine and Health Development, China), and Shaofeng Wu (Institute of Traditional Chinese Medicine and Health Development, China)

Regression Analysis of General Education for Equestrian Professionals in Colleges and Universities Based on IEO Model 39
Xiaqing Zhang (Wuhan Business University, China)

An Empirical Study on the Changes in Health Inequality of Chinese Residents: Based on Data from China Health and Nutrition Survey 45
Jingru Ren (Shenzhen Institute of Information Technology, China)

Biomechanics and Engineering Applications of Race Walking 50
Yibing Wang (Capital University of Physical Education and Sports, China), Guangshun Hu (Shandong Vocational and Technical University of International Studies, China), Xuejing Peng (China Three Gorges University, China), and Hou-Lin Li (Capital University of Physical Education and Sports, China)

A Medical Dialogue System Based on DIET and Knowledge Graph 56
Jingbo Hao (Nanchang Institute of Science & Technology, China), Rongbo Li (Meteorological Observatory, China), Hairui Fei (Intelligent Technology Department, China), and Yang Tao (Nanchang Institute of Science & Technology, China)

Isokinetic Strength Training Improves Motor Function in a Chinese Classical Dancer with Knee Injury: A Case Report 60
Yanjing Ren (Physical Education and Sports Capital University, China), Tian Yue (Beijing Sport University, China), and Fengxue Qi (Beijing Sport University, China)

Metabolism Characteristics of Organic Acids in Urine of Greco-Roman Wrestlers Before Competitions 65
Zhiyuan Sun (Shandong Sport university, China), Jie Liu (Wolong Road Primary School, China), Chang Meng (Qilu Medical University, China), and Xuewen Tian (Shandong Sport university, China)

Research on the Spatial Clustering of Tuberculosis Cases in Wenshan Prefecture, Yunnan Province from 2009 to 2018 70
Zizhao Zhao (Kunming Medical University, China), Zhong Sun (Universiti Putra Malaysia, China), Songwang Yang (Kunming Medical University, China), Hongyu Chen (Kunming Medical University, China), Dihan Li (Kunming Medical University, China), Rong Li (Kunming Medical University, China), Yuzhuo Zhang (Kunming Medical University, China), Shiyuan Dai (The People's Hospital of Guizhou Province, China), Yaqi Yang (First People's Hospital of Yunnan Province, China), Juan Luo (Yunnan Armed Police General Hospital, China), Pengyu Dong (The First Affiliated Hospital of Nanchang University, China), Feng He (Shajing Preventive Health Center, China), Guozhong He (Kunming Medical University, China), and Chuntao Chen (Peking University Shenzhen Hospital, China)

Data Mining Investigation of the Association Between Social Problem Solving and Weight Loss for Obesity Control 76
Yong Xue (University of Chinese Academy of Sciences, China) and Yiwen Chen (University of Chinese Academy of Sciences, China)

A Study on the Phenomenon of Square Dancing Among Residents of Guangzhou, Guangdong: An Empirical Analysis Based on Data Application 81
Jiaxin Liao (Guangdong University of Foreign Studies, China), Jun Yin (Guangdong University of Foreign Studies, China), Shaoxiang Xu (Macau University of Science and Technology, China), Tong Liu (Guangdong AIB Polytechnic College, China), and Yongshi Tan (Guangdong University of Foreign Studies, China)

Telemetry Data Analysis on sEMG Major Muscle Groups in Hanging-up-and-Passing-Through Horizontal Ladder of 400m Obstacles 86
Xiaonan Wu (National University of Defense Technology, China), Mei Song (National University of Defense Technology, China), and Bo Zhang (National University of Defense Technology, China)

Comments on using Logistic Regression to Explore Associations Between Physical Activity and Happiness 90
Yuan Kai (Fudan University, China) and Congkai Sun (University of Minnesota, United States)

An Evaluation Study on the Prevention of Mild Cognitive Impairment (MCI) by External Factors Through Physical Activity (PA)-Evidence from a National Survey 95
Simeng Dong (Chongqing University of Posts and Telecommunications, China), Qinnan Dong (Chongqing Technology and Business University, China), Shuai Yang (Chongqing University of Posts and Telecommunications, China), and Tiantian Zhang (Nagasaki University, China)

The Association of Income and Depression Status Among Chinese Middle-Aged and Older People: A National Representative Longitudinal Study 101
Shiyun Bao (Santa Barbara City College)

Analysis of Physical Activity in China Based on Linear Regression Model 106
Zhifu Li (Anhui Vocational and Technical College of Sports, Anhui) and Wei Liu (Anhui Vocational and Technical College of Sports, Anhui)

Research on the Optimization of "Physical Fitness and Health Management" Major in Colleges and Universities -- From the Perspective of Health Big Data Demand 110
Jingjing Chen (Health College of Guangzhou Xinhua University), Kewei Yu (Guangzhou Xinhua University), Yinglin Pan (Guangzhou Xinhua University), and Junying Wu (Guangzhou Xinhua University)

Research on Evaluation Model of College Students' Mental Health 114
Bingbing Li (Yichun Vocational Technical College, China) and You Xu (Yichun Vocational Technical College, China)

Experimental Research on Children's Water Safety Education Model in China 118
Shichao Zhang (Yunnan Normal University, China), Jia Dai (Yunnan Normal University, China), and Zhenxin Nie (Yunnan Normal University, China)

Using Regression Analysis to Explore Sex Health Cognition of Female College Students in China 125
Ching-Chien Yang (Nanning Normal University, China), Ling Ling He (Nanning Normal University, China), Yuchen Ding (Nanning Normal University, China), and Chaohui Tang (Nanning Normal University, China)

Chapter 2. Smart Sports and Wearable Sports Equipment Design

Empirical Research of Sports Assisted EMG Mechan-Ical Bionic Prosthesis 130
Xiaoming Zhou (Zhengzhou University, China), Zhihao Du (Beijing Normal University, China), Cunhang Li (Zhengzhou University, China), Haoming Zhang (Zhengzhou University, China), Xiuli Zhang (Zhengzhou University, China), and Jiahao Hu (Zhengzhou University, China)

Application of Wearable Devices in Sports: Behavior Change and Result Effect 137
Qun Yang (Guang Zhou sport university research institute, China), Jian Sun (Guang Zhou sport university research institute, China), Zhi Yong Zhang (Guang Zhou sport university research institute, China), Shi Cong Ding (Guang Zhou sport university research institute, China), Zai Chen (Guang Zhou sport university research institute, China), Xu Yan Cui (Guang Zhou sport university research institute, China), and Duan Ying Li (Guang Zhou sport university research institute, China)

Research on the Feasibility Analysis and Implementation Path of 5G Network Integrating into Smart Sports Classes in Colleges and Universities 148
Ju Li (Sports Department of Guangxi Medical University, China)

Application of Applied Computer Technology in Modern Sports Field 154
Wenjun Zou (Nanchang JiaoTong Institute, China)

A Study of Online Physical Training for College Students Based on FMS in the Epidemic Situation 158
Peng Lin (Guangdong Industry of Polytechnic, China), Qiongsheng Xie (Guangdong Vocational Institute of Pubil Administration, China), Shaohui Du (Guangdong Industry of Polytechnic, China), Yansheng Chen (Guangdong Industry of Polytechnic, China), Xiaolin Zeng (Guangdong Industry of Polytechnic, China), and Yishui Cai (Shantou Hesheng 1.3 billion Sports Development Co. LTD, China)

Experimental Study on Badminton Thinking Construction Based on Generative Adversarial Networks and Unsupervised Learning 167
YuJue Chen (QingHai Normal University, China), He Hu (Xi'an University of Technology, China), Qiang Li (QingHai Normal University, China), and ShiNing Liu (QingHai Normal University, China)

Construction of Functional Structure Model of University Smart Gymnasium Under the Background of "Internet +" 172
Bing Bai (Department of Physical Education Nanchang Institute of Technology, China)

Application of Smart Wearing Real-Time Heart Rate Monitoring in Sports Training 177
Baochen Zhang (Department of Physical Education Nanchang Institute of Technology, China)

Opportunities and Challenges of Smart Sports Development in China Under the Background of 5G 181
Pei Lin (Nanchang Institute of Technology, China)

Use the Special Dynamometer for Kayak to Simulate and Analyze the gas Metabolism Characteristics of High-Level Kayakers at Different Stages of the Competition 185
Yijun Chen (Jiangxi Normal University, China), Kejun Zhou (Jiangxi Normal University, China), Yiyao Liu (Jiangxi Normal University, China), and Zhigang Gong (Jiangxi Normal University, China)

Do the Endurance or the Resistance Exercise Firstly?: A Meta-Analysis on the Sequence Effect of the Intra-Session Concurrent Training 189
Yue Li (Shenzhen Institute of Information Technology, China), Yang Li (Lanzhou University, China), Yuerong Hao (QingDao University, China), and Jiling Zou (Jiangsu Normal University, China)

Statistical Analysis of Sling Exercise Training on Swimmer's Core Strength and Balance Ability Experiment 196
Xu Liu (Taiyuan University of Technology, China) and Jie Gao (Beijing Sport University, China)

An Empirical Study on the Agglomeration Effect of Sports Industry on Chinese Economy 202
Changhong Zeng (Hu Bei Business College, China) and Jing Liang (Chongqing Vocational College of Transportation, China)

Elite Male Freestyle Swimmers hip Roll Characteristics Research 206
Mingyu Shang (China Institute of Sport Science, China) and Yan Cheng (China Institute of Sport Science, China)

Physical Fitness Test System Based on Visual Analysis 210
Yanyu Liu (ZheJiang Dahua Technology CO., LTD., China) and Chenli Feng (Hangzhou Qiantang Experimental Primary School, China)

Study on the Influence of Sports Industry Development on the Consumption Growth of Sports Nutritional Food 215
Haoqiang Sun (Guizhou Normal University, China), Xiaozhi Zhang (Guizhou Business School, China), Yujia Yin (Guiyang University, China), and Jing Xu (Guiyang University, China)

Construction of an Evaluation Index System for the Enforcement Effects of Campus Football Teacher Training in the Guangdong-Hong Kong-Macao Greater Bay Area 220
Zhiliang Jia (Guangzhou Civil Aviation College, China)

Research on the Coordinated Development Mechanism of Sports Industry in Underdeveloped Areas with “Integrating into the Bay Area” as the Background: Taking the Development of Sports Industry in Heyuan City as an Example 224
Guolong Yin (Heyuan polytechnic, China)

Research on the Basketball Competitive Intelligence System 229
Wen Yue (Beihang University, China), Peng Guo (Shenyang Sport University, China), Tiezheng Wu (Beihang University, China), and Xueyuan Wang (Beihang University, China)

An Experimental Study of "All Involved Sports Meet Program" on Physical Improvement of Students in " Universities Participate in Primary School Education Project " Schools in Beijing 236
Xin Yang (Beijing Normal University, China), Tiancui Ding (Beijing Normal University, China), Qihong Chen (Renmin University of China, China), and Lijuan Hou (Beijing Normal University, China)

Application of VR Technology in Physical Education 241
Shijun Fan (Tianjin University of Technology, China) and Xiaohua Chen (Tianjin University of Technology, China)

Research on the Development Trend of Vault in Women's Competitive Gymnastics: Based on the Tokyo Olympics Games 248
Jiao Jiao Dai (Beijing Sport University Competitive Sports Institute, China) and Jin Lin Liu (Shandong Normal University Sports Institute, China)

Research on Comprehensive Intervention of Aerobics on Mobile Phone Addiction of Female College Students 252
Ling Yu (Dept.P.E. of Central South University, China), Jun-Mei Xia (Dept.P.E. of Central South University, China), and Si-Yao Gao (Dept.P.E. of Central South University, China)

Visual Analysis of Citespace Based Wearable Sports Equipment Research Progress 257
Hongzhen Liu (Zhengzhou University, China) and Dechang Yang (Zhengzhou University, China)

Differences of the Standing Long Jump Results Tested by Two Methods with Pared-Samples T Tests 263
Xiang Xin (Beijing Normal University, China) and Wang Qi (Beijing Normal University, China)

Research on Lower Limb Motion Characteristics of Oblique Stride on "Euro Step" Layup Based on Intelligent Motion Capture System 268
Zhaoxin Shen (Beijing Sport University, China), Lei Li (Beijing Sport University, China), and Xiangyu Zhao (Beijing Sport University, China)

Influence of Run-up Speed on Chinese Male Triple Jump Performance 277
PengPeng Han (China Institute of Sport Science, China) and TingGang Yuan (China Institute of Sport Science, China)

Spatial Variability Optimization Of Volleyball Player's Position Rotation In Machine Vision 281
Liping Chen (School of Hygiene and Health of BaoTou Medical College, China), Pengmei Liu (School of Hygiene and Health of BaoTou Medical College, China), Yanchun Wang (School of Hygiene and Health of BaoTou Medical College, China), and Jun Han (BaoTou Medical College, China)

Study on the Influence of Elastic Belt Resistance Training on the Speed of Young 400 Meters Athletes 287
Wenchao Li (Capital University of Physical Education and Sports, China), Xiaoyan Sun (Capital University of Physical Education and Sports, China), Yuting Fan (Capital University of Physical Education and Sports, China), Houlin Li (Capital University of Physical Education and Sports, China), and Zhengyang Song (Capital University of Physical Education and Sports, China)

Research on Design Preferences of Furniture for the Elderly in the Home Care Model Based on Q Methodology 291
Wei Chen (Nanchang Institute of Technology, China; Dong-A University, South Korea)

Visual Analysis of Biomechanical of Lower Limbs in 2001-2020 Based on VOSviewer 296
Xinyi Wei (Nanjing Sport Institute, China), Qian Chen (SuqianZeda Vocational College, China), Sijie Yang (SuqianZeda Vocational College, China), and Ruhao Huang (Hunan Normal University, China)

Author Index **301**