Special Issue on Advanced Sensing Technologies and Their Applications in Human/Animal Activity Recognition and Behavior Understanding

PREFACE



With the miniaturization and performance enhancement of sensing, communication, and computation functionalities, as well as advances in AI technology, research on human activity recognition and behavior understanding (ARBU) is flourishing, targeting, for example, healthcare in the home and work efficiency in the office. The research is not limited to humans, and research has also progressed on the management and welfare of pets, livestock and other animals. In this special issue, six interesting and novel articles are included.

In the first article, Yanjun Feng and Jun Liu propose a new attentional detection method for detecting humans and animals, as well as their interactors, which exploits global-local information to measure spatiotemporal relations between adjacent frames, boosting behavior understanding. The second article is a review article by Xuna Wang et al., in which the research status and prospects for the application of motion information obtained by noncontact visual sensors in the intelligent diagnosis and treatment of autistic patients were explored. The third article by Boqi Wu et al. concerns a novel pedestrian navigation algorithm consisting of zero velocity detection and its correction to tackle the accumulation errors in a traditional strap-down inertial navigation system. In the fourth article, Bing Xie et al. propose a gait phase recognition algorithm based on lower limb surface electromyography signals for motion intention recognition in the motion control of exoskeleton robots. The algorithm is applied in an improved cuckoo search algorithm to support vector machine to accelerate convergence and improve the recognition accuracy. In the fifth article, Guanyu Chen et al. present a behavior recognition method for cats and dogs based on a wearable inertial measurement unit, which employed a hybrid model of feature learning and feature engineering recognition pipelines. In the sixth article by Ziaullah Momand et al., a novel methodological framework that addresses the challenges of integrating heterogeneous sensor data with LLMs to provide real-time healthcare insights for caregivers of the elderly using sensor technologies is proposed.

These articles are of great interest to readers working in this field and its applications and present new knowledge, methodologies and challenges. I would like to thank all the authors for their interesting and valuable contributions, and also the dedicated reviewers for their constructive suggestions and valuable comments. I also thank the editorial staff of *Sensors and Materials* for their efforts in publishing this special issue.

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