SPECIAL ISSUE ON INTELLIGENT SENSING SYSTEM SUPPORTING HUMAN ACTIVITIES

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Recent factsheets published by the World Health Organization (WHO) reveal that over 1 billion people, corresponding to about 15% of the world's population, are estimated to live with some form of disability [1]. Approximately 190 million (3.8%) people aged 15 years and older have significant difficulties in functioning and also require healthcare services. The number of people with disabilities is dramatically increasing due to ageing population and an increase in chronic health conditions. Moreover, statistics from WHO shows that the number of people aged 60 years and older (ageing people) was 1 billion [2] in 2019. The number and proportion of ageing people in the population will increase to 1.4 billion by 2030 and 2.1 billion by 2050. This increase is occurring at an unprecedented pace and will accelerate in coming decades, especially in developing countries. Strategies are needed to enable people with disabilities and ageing to support their daily living, prevent diseases or support in rehabilitation, which is costly to individuals and the healthcare system.

As mentioned above, people with disabilities and ageing have difficulty of quality of life (e.g., physical and mental health). Assistive technology is crucial for the elderly and people with disabilities to do self-care, raising self-esteem and improving quality of life (e.g., physical and mental health, safety and freedom). Recently, intelligent sensors have become a powerful tool to expand functionality with features such as remote programmability, self-monitoring (health checking) and the ability to connect multiple sensors on the cable. Intelligent sensing system is a way to enhance and support people with disabilities and ageing as well as everyone. To develop the optimal support system for each individual, it is necessary to correctly recognize the state of mind and body, surrounding environment, and to properly support them.

Therefore, this special issue will not only present development of assistive technology for the elderly and people with disabilities, but also widely discuss the basic methodology for the development of human activity support technologies and a wide range of topics for active discussion. The purpose of this special issue is to provide a forum for researchers and practitioners to exchange ideas and progress in related areas.

This special issue includes articles on innovative research to address challenges of analytics and applications for intelligent sensing systems supporting human activities. Hashizume et al. studied a variability of the minimum toe clearance with age. This study will be useful for balancing and avoiding fall in older people. Li et al. proposed a waiting person measurement method that reduces erroneous addition by people who do not belong to the actual queue. This result will benefit healthcare service to improve the queuing patient counting system. Cheng and Tanaka examined evaluation indices of contrast improvement for dichromacy to reduce the computational cost. This will be useful for people

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with color vision deficiency to enhance their experience in visual information. Arahira et al. studied fracture mechanism of nonabsorbable porous hydroxyapatite. This study will benefit orthopedic treatments. Sarakon et al. proposed a method to construct a compact AI model suitable for embedded systems. This result will be useful for the sophistication of the assist systems. Kataoka et al. proposed a simultaneous multi-point estimation method for the depths of water. This study will benefit assistive device improvement for blind and visually impaired people. Ohtsuki et al. studied an image correction method to beautify Japanese handwritten characters using generative adversarial networks. This will be useful for supporting people to write handwritten characters with confidence. Orii et al. proposed a tactile texture recognition method using pressure and motion sensors. This result will benefit artificial organs enhancement to improve touch modality for people with disabilities. Orii et al. also proposed a data embedding method for printed images using multilayer neural networks. The result will help reduce image deterioration when embedding information.

REFERENCES

[1] WHO.int. 2021, *Disability and Health*, https://www.who.int/news-room/fact-sheets/detail/disability-and-health, Retrieved on April 21, 2021.
[2] WHO.int. 2021, *Ageing and Health*, https://www.who.int/news-room/fact-sheets/detail/ageing-and-health, Retrieved on April 21, 2021.