Journal of
Sensor and Actuator Networks

MDPI

Editorial

Modern Forms and New Challenges in Medical Sensors and Body Area Networks

Yudong Zhang [1,*], Juan Manuel Gorriz [2] and Shuihua Wang [1]

[1] School of Computing and Mathematical Sciences, University of Leicester, Leicester LE1 7RH, UK
[2] Department of Signal Theory, Telematics and Communications, University of Granada, 18071 Granada, Spain
* Correspondence: yudongzhang@ieee.org

Traditional medical sensors/monitors can measure pressure, airflow, force, oxygen, pulse, temperature, etc. They can continuously measure vital signals and/or repeatedly perform medical tests [1]; help in monitoring for cardiac events [2], hemodynamics, respiration [3], glucose levels, and body temperature; and benefit individuals in long-term care [4] and those with automated insulin pumps [5]. However, a shortcoming is the immobility of some of the large, heavy sensors.

Hence, the patient requirement for portability has popularized the use of portable sensors. Body area network (BAN) technologies utilize low-power wireless gadgets, which are either embedded in or carried on the body [6]. Another advantage of BANs is the location-independent monitoring facility [7]. However, a shortcoming is that they do not offer any view of the inside of the body, meaning that they may not help doctors in situations that require internal examination.

On the other hand, medical imaging sensors—for example, X-ray, magnetic resonance imaging (MRI), computed tomography (CT), positron emission tomography (PET), and single-photon emission computed tomography (SPECT)—play an essential role in checking the anatomic structure, functional, and physiological processes of the body. Using medical imaging sensors, doctors can precisely make a diagnosis and recommend complementary treatments for many diseases, such as Alzheimer's disease [8], brain tumors [9], and other diseases [10], such as alcoholism, COVID-19 [11], etc.

We believe that medical sensors and body area networks complement each other, with the ultimate goal of providing better services for patients and doctors. All related papers with the potential to improve methods in their fields or those that report on recent advances are welcome in the current Special Issue: "Medical Sensors and Body Area Networks".

Funding: This research received no external funding.

Conflicts of Interest: The authors declare that the research was conducted without any commercial or financial relationships that could be construed as potential conflicts of interest.

check for updates

Citation: Zhang, Y.; Gorriz, J.M.; Wang, S. Modern Forms and New Challenges in Medical Sensors and Body Area Networks. *J. Sens. Actuator Netw.* **2022**, *11*, 79. https://doi.org/10.3390/jsan11040079

Received: 10 November 2022
Accepted: 22 November 2022
Published: 23 November 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

References

1. Halley, S.; Ramaiyan, K.P.; Tsui, L.K.; Garzon, F. A review of zirconia oxygen, NOx, and mixed potential gas sensors—History and current trends. *Sens. Actuators B Chem.* **2022**, *370*, 132363. [CrossRef]
2. Flick, M.; Jobeir, A.; Hoppe, P.; Kubik, M.; Rogge, D.E.; Schulte-Uentrop, L.; Kouz, K.; Saugel, B. A new noninvasive finger sensor (NICCI system) for cardiac output monitoring A method comparison study in patients after cardiac surgery. *Eur. J. Anaesthesiol.* **2022**, *39*, 695–700. [CrossRef] [PubMed]
3. Zaltieri, M.; Massaroni, C.; Di Tocco, J.; Bravi, M.; Morrone, M.; Sterzi, S.; Caponero, M.A.; Schena, E.; Lo Presti, D. Preliminary assessment of a flexible multi-sensor wearable system based on fiber bragg gratings for respiratory monitoring of hemiplegic patients. *Int. J. Environ. Res. Public Health* **2022**, *19*, 13525. [CrossRef] [PubMed]
4. Joo, J.E.; Hu, Y.; Kim, S.; Kim, H.; Park, S.; Kim, J.H.; Kim, Y.; Park, S.M. An indoor-monitoring LiDAR sensor for patients with alzheimer disease residing in long-term care facilities. *Sensors* **2022**, *22*, 7934. [CrossRef] [PubMed]
5. Burnside, M.J.; Lewis, D.M.; Crocket, H.; Meier, R.; Williman, J.; Sanders, O.J.; Jefferies, C.A.; Faherty, A.M.; Paul, R.; Lever, C.S.; et al. The CREATE trial: Randomized clinical trial comparing open-source automated insulin delivery with sensor augmented pump therapy in type 1 diabetes. *Diabetes* **2022**, *71*, 286. [CrossRef]
6. Nusrat, T.; Dawod, F.S.; Islam, T.; Kunkolienker, P.; Roy, S.; Rahman, M.M.; Ghosh, S.; Dey, S.; Mitra, D.; Braaten, B.D. A comprehensive study on next-generation electromagnetics devices and techniques for internet of everything (IoE). *Electronics* **2022**, *11*, 3341. [CrossRef]
7. Sid, A.; Cresson, P.Y.; Joly, N.; Braud, F.; Lasri, T. A flexible and wearable dual band bio-based antenna for WBAN applications. *AEU-Int. J. Electron. Commun.* **2022**, *157*, 154412. [CrossRef]
8. Ullah, Z.; Jamjoom, M. A deep learning for alzheimer's stages detection using brain images. *CMC-Comput. Mat. Contin.* **2022**, *74*, 1457–1473, 032752. [CrossRef]
9. Rathore, F.A.; Khan, H.S.; Ali, H.M.; Obayya, M.; Rasheed, S.; Hussain, L.; Kazmi, Z.H.; Nour, M.K.; Mohamed, A.; Motwakel, A. Survival prediction of glioma patients from integrated radiology and pathology images using machine learning ensemble regression methods. *Appl. Sci.* **2022**, *12*, 10357. [CrossRef]
10. Zhu, Z.; Lu, S.; Wang, S.-H.; Gorriz, J.M.; Zhang, Y.-D. DSNN: A DenseNet-based SNN for explainable brain disease classification. *Front. Syst. Neurosci.* **2022**, *16*, 838822. [CrossRef] [PubMed]
11. Wang, S.-H. COVID-19 classification by FGCNet with deep feature fusion from graph convolutional network and convolutional neural network. *Inf. Fusion* **2021**, *67*, 208–229. [CrossRef] [PubMed]