



### Biometrics in Industry 4.0 Open Challenges and Future Perspectives

**Theme:** The paradigm of Industry 4.0 aims at reinventing procedures and business strategies in all industrial/factory fields. On the other hand, such a renovation generates massive amounts of data, lying from traditional tracking information of goods and services but also source codes, technology information and intellectual property. This represents a serious threat for corporations that must invest, more than in the past, in protocols and procedures to keep their data secure from being stolen or widespread over networks. Therefore, this special issue will be devoted to selected papers focused on open challenges in the context of security and safety of Biometrics in Industry 4.0. Strong authentication mechanisms represent the key to ensure such a high level of security of data and Biometrics may play a crucial role in this scenario. Biometric traits, both physical and behavioral, can be used to build up strong authentication platforms and infrastructure of trust enabling big corporations to protect their data against criminal attacks. On the other hand, the use of authentication mechanisms based on biometric solutions can often collide with national and international regulations which tend to protect sensitive information. While the use of biometrics for security can be developed in full awareness of the users, in case of safety the collection of biometric data concerns a more subtle concept of privacy. In a private context, the security aims at guaranteeing controlled access/use to spaces and devices for a limited number of users. In public, is the safety to be guaranteed, involving a wider number of users whose biometrics data need to be acquired and protected. The ethical and practical implication of the use of biometrics data in safety needs to be further explored. The choice of the biometric traits (either hard or soft) as well as the mechanism to put in place to protect those data and the user's privacy ask for meticulous studies of the minimum number of traits to be involved in the monitored environment to achieve systems that are privacy preserving and also robust and reliable. Augmented reality applications have been intensively promoted by Industry 4.0 but their usage in operative environments is not free from risks for employees and trainees. The analysis of behavioural biometric traits, and soft biometrics in general, can provide useful estimations on postures and gestures during augmented reality training sessions. They can be used both to assess the suitability of the augmented reality application and indicate excessive physical workload that may attempt personnel safety. Similarly, behavioural biometrics can be exploited in real working environments to estimate the attention status of the employees while working with complex and advanced equipment, which could not be supported by user/ergonomical study. The analysis of behavioral patterns can assist the employees to detect harmful attitudes thus preventing accidents and risks for people and equipment.

This special session aims to provide a platform for researchers from both academic and industrial sessions to report their recent results and overlook emerging research directions in data security using biometrics in industrial 4.0.

#### This special section will focus on (but not limited to) the following topics:

1. Biometric authentication protocols
2. Physical and Behavioral biometrics
3. Multibiometric systems
4. Biometrics authentication in Cloud Computing
5. Contactless biometric authentication
6. Video Surveillance systems based on biometrics
7. Analysis of the personnel safety through soft biometrics
8. Access control systems based on Biometrics
9. Secure electronic payments through Biometrics
10. Legal regulations for Biometrics in Industry
11. Privacy preserving industrial solutions
12. Biometric solutions for safe Augmented Reality

#### Manuscript Preparation and Submission

Follow the guidelines in "Information for Authors" in the IEEE Transactions on Industrial Informatics <http://www.ieee-ies.org/pubs/transactions-on-industrial-informatics>. Please submit your manuscript in electronic form through Manuscript Central web site: <https://mc.manuscriptcentral.com/tii>. On the submitting page #1 in popup menu of manuscript type, select: SS on **Biometrics in Industry 4.0 Open Challenges and Future Perspectives**

Submissions to this Special Section must represent original material that has been neither submitted to, nor published in, any other journal. Regular manuscript length is 8 pages.

**Note:** The recommended papers for the section are subject to final approval by the Editor-in-Chief. Some papers may be published outside the special section, at the EIC discretion.

**Timetable:** **Deadline for manuscript submissions** **January 30, 2022**  
Expected publication date (tentative) **September 2022**

#### Guest Editors:

**Dr. Zhiwei Gao**, University of Northumbria, UK [zhiwei.gao@northumbria.ac.uk](mailto:zhiwei.gao@northumbria.ac.uk)

**Dr. Aniello Castiglione**, University of Naples Parthenope, Italy [castiglione@ieee.org](mailto:castiglione@ieee.org)

**Prof. Michele Nappi**, University of Salerno, Italy [mnappi@unisa.it](mailto:mnappi@unisa.it)

---

**Editor-in-Chief:** Prof. Dr.-Ing. Ren C. Luo

[tii@ira.ee.ntu.edu.tw](mailto:tii@ira.ee.ntu.edu.tw)

<http://www.ieee-ies.org/pubs/transactions-on-industrial-informatics>