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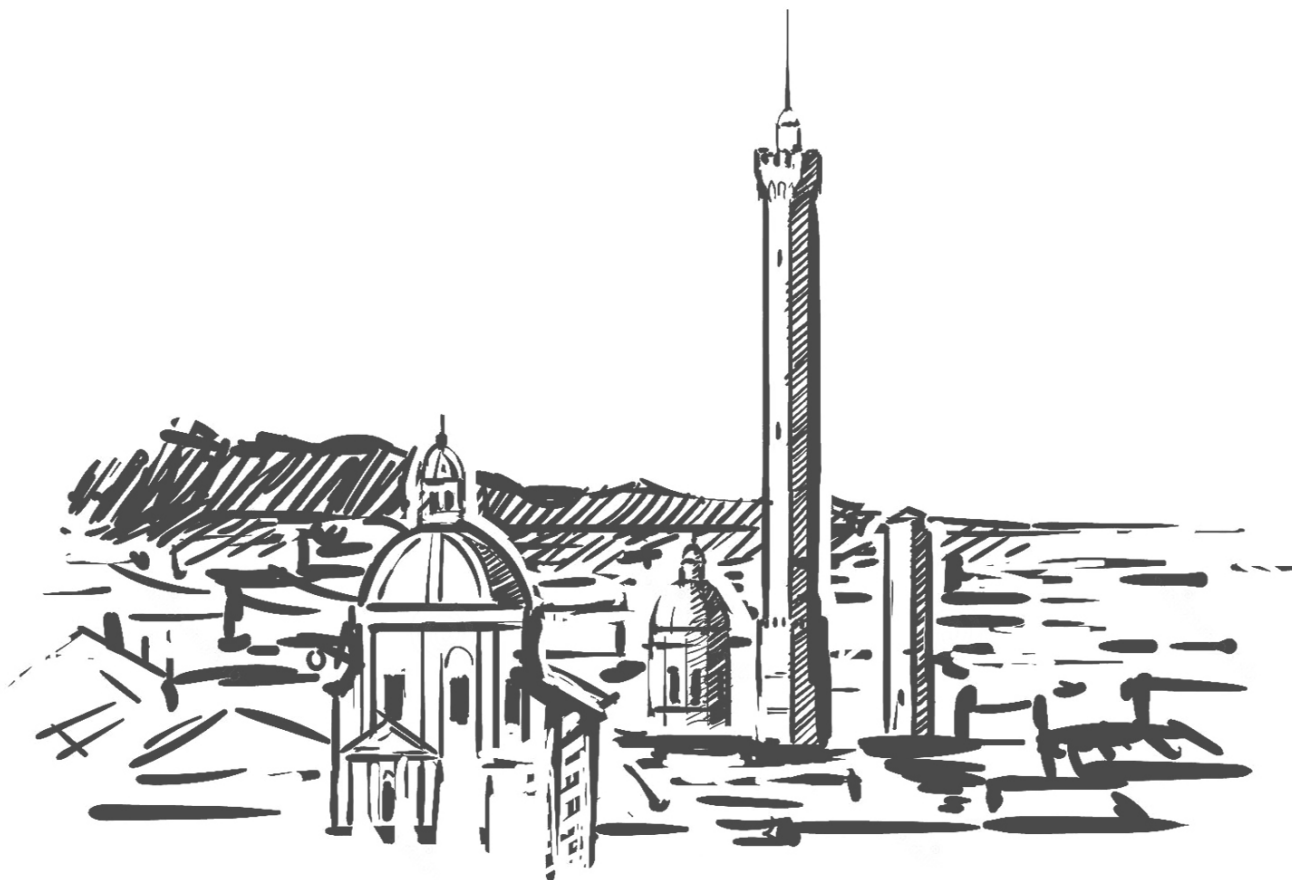
L'ARTE DELLA MENTE SCIENTIFICA

RACCOLTA DI ARTICOLI SCIENTIFICI

CON GLI ATTI DELLA IV CONFERENZA SCIENTIFICA E PRATICA INTERNAZIONALE

RICERCHE SCIENTIFICHE E METODI DELLA LORO REALIZZAZIONE: ESPERIENZA MONDIALE E REALTÀ DOMESTICHE

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*Presidente del Comitato Organizzatore: Holdenblat M.
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*Responsabile del layout: Bilous T.
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SEZIONE XI. DISPOSITIVI DI AUTOMAZIONE E PRODUZIONE

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COMPARATIVE ANALYSIS OF THE BASIC METHODS USED IN INDUSTRY 4.0 AND INDUSTRY 5.0.

ORCID ID: 0000-0002-2590-7085

Vladyslav Yevsieiev
Doctor of Engineering Science,
Professor of Department of Computer-Integrated Technologies,
Automation and Robotics
Kharkiv National University of Radio Electronics

ORCID ID: 0000-0002-2272-5227

Dmytro Gurin
Associate Professor of Department of Computer-Integrated Technologies,
Automation and Robotics
Kharkiv National University of Radio Electronics

UKRAINE

The term Industry 5.0 was coined by Michael Rada [1]. One of the key aspects of Industry 5.0 is the use of collaborative robots to help reduce risks. These robots can notice, understand and sense the human operator, as well as the goals and expectations of the tasks being performed. These robots are expected to observe and learn how a human performs a task and assist human operators in completing that task. In addition, Industry 5.0 involves the penetration of artificial intelligence into human life in order to increase its potential. In Industry 5.0, advanced IT technologies, the Internet of Things, robots, artificial intelligence and augmented reality are actively used in the industry for the benefit and convenience of human workers [2-4]. Industry 5.0 recognizes the ability of industry to meet social challenges that go beyond employment and development, to become a sustainable source of development, making production aware of the limitations of our planet and prioritizing the health of employees. To become a trusted system for people seeking a satisfying and healthy career, Industry 5.0 promotes the technology upgrade needed by the industry. It prioritizes the well-being of workers and uses new technologies to create wealth beyond employment and growth while respecting the limits of the planet. It empowers workers and meets their changing skills and training requirements. Table 1 provides an example of a comparison of the use of basic technologies within Industry 4.0 and Industry 5.0.

Table 1

Comparison of the use of basic technologies within Industry 4.0 and Industry 5.0.

Parameter	Industry 4.0	Industry 5.0.
1	2	3
Target	The main focus is on smart manufacturing, system optimization and supply chain	Focus on sustainability, environmental management, human-centeredness and social benefit
System approaches	Real-time data monitoring, integrated lifecycle chains	Adopting ethical, human-centered and socially oriented technologies, as well as the application of the 6R methodology and the principles of logistics efficiency

Continuation of the tab. 1

1	2	3
Human Factors	The main focus is on human reliability, interaction with the computer and optimization of repetitive movements.	Strengthening security and personnel management, focus on employee education and training
Implementing technologies and concepts	Cloud computing, internet of things, big data, digitization, automation, cyber-physical systems and other related technologies	Surrounded by technologies that facilitate human-machine interaction, multilingual speech and gesture recognition, collaborative robots, decision support systems, and other similar technologies.
Environmental consequences	Improvement in cost efficiency, waste prevention through additive manufacturing and data analysis, but with increased consumption of materials and energy	Emphasis on waste prevention and recycling, use of renewable energy sources, smart and non-volatile sensors

The general current state of understanding of Industry 5.0 describes it as a movement to bring human participation back into manufacturing. This is due to the desire of the consumer for mass personalization. This understanding means that Industry 5.0 products provide consumers with the opportunity to fulfill their desire to express themselves, and they will pay more for it [5-7]. In summary, Industry 5.0 is a vision to make industry a more sustainable, human-centered, and safer collaborative work environment. Some see it as an evolutionary, gradual development based on the concepts and practices of Industry 4.0, while others see Industry 5.0 as an addition to the Industry 4.0 paradigm [8-13].

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