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Editorial: HCI and worker well-being

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Editorial on the Research Topic
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Human-centered approaches to worker well-being in the age of Industry 5.0

Worker well-being is a key factor for the success of any productive activity in the labor market. While research has extensively explored various well-being aspects, such as support systems, instruction design, and ergonomic improvements (Heikkilä et al., 2021; Lithoxidou et al., 2022; Jimenez and Maire, 2023; Dhiman et al., 2024), a considerable journey remains ahead to achieve truly sustainable and healthy work environments. The emerging Industry 5.0 paradigm, which complements technological advancements with an enhanced focus on human workers, becomes even more critical in light of the aging population in many countries (Kallestrup-Lamb et al., 2024).

Industry 5.0 heralds a new era where human-centric technological solutions empower workers, ensuring a healthy, safe, and sustainable working style. This paradigm shift emphasizes the short and long-term development of both soft and hard skills, aiming to foster environments where workers can thrive physically and cognitively. To realize this vision, the research community faces several challenges, including identifying appropriate sensors for monitoring well-being parameters and the development of communication strategies that respect privacy while maintaining productivity.

This Research Topic features a collection of articles that delve into diverse aspects of worker well-being within the Industry 5.0 framework. Each contribution provides valuable insights and advances our understanding of creating better workplaces by addressing *both physical and cognitive well-being* and *respecting workers' privacy*.

Research has shown that fostering employees' psychological well-being leads to positive outcomes for both individuals and organizations. Yet, it is rarely a design goal in developing digital solutions for the workplace. The work of Dhiman et al. reviews current assistance technologies, maps facets of workplace well-being, and identifies the need for comprehensive frameworks targeting eudaimonic well-being in workplace design.

The rapid growth of artificial intelligence (AI) in workplaces across domains calls for a deeper understanding of its impact and risks before integration into workplace systems. Makridis et al. focus on the opportunities and risks related to the rapid expansion of AI in healthcare, necessitating more effective risk management strategies. In their article, Makridis et al. propose incorporating supplemental AI-specific questions into the institutional review boards (IRB) review process to mitigate risks. This work has been successfully piloted within the Department of Veterans Affairs in the US, demonstrating enhanced review efficiency and improved reviewer attitudes toward assessing AI-related projects.

In this same Research Topic, Berretta et al. introduce the Job Perception Inventory (JOPI), a survey-based tool that validates the (future) usage of AI applications with employees, and is designed to support human-centered AI implementations of intelligent technologies. JOPI can help organizations carefully and considerately introduce AI technologies in the workplace from an employee's point of view.

Khanum et al. use AI as a tool to analyze worker well-being, focusing on neck pain. Mechanical neck pain is common among computer professionals due to prolonged computer use, and this study investigates its relationship with various factors using advanced machine learning techniques (Khanum et al.). The findings highlight that the Neck Disability Index (NDI) score is the most significant predictor of pain intensity, suggesting that machine learning can help develop tailored ergonomic solutions and health campaigns for this population.

Finally, although the worst of the COVID pandemic seems to be behind us, this pandemic has greatly affected worker well-being and how workers interact at their workplaces. As such, it is a topic that we definitively wanted to include in this Research Topic. McKenna et al. investigate how the increased use and duration of Personal Protective Equipment (PPE) among healthcare workers (HCWs), resulted in frequent reports of PPE-related side effects, particularly skin conditions and pressure-related Research Topic. Their study highlights the necessity for innovative PPE designs that maximize protection while minimizing adverse effects and calls for further research and practical applications to reduce the incidence of these side effects.

Collectively, these contributions underscore the multifaceted nature of worker well-being and the intricate interplay between

technology and human factors. As we move further into the Industry 5.0 era, it is imperative that we continue to develop and refine human-centric solutions that not only enhance productivity but also ensure the well-being of workers. By addressing both the physical and cognitive aspects of well-being and respecting workers' privacy, we can create work environments that are not only productive but also nurturing and sustainable.

Author contributions

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