RIVISTA ITALIANA DI ERGONOMIA
ORGANO UFFICIALE DELLA S.I.E. - SOCIETÀ ITALIANA DI ERGONOMIA E FATTORI UMANI

EDITORIAL

ERGONOMICS AND DESIGN FOR ALL: ENHANCING INCLUSION THROUGH HUMAN-CENTERED DESIGN

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The goal of this volume of The Italian Journal of Ergonomics is to explore the intersection of Ergonomics and Design for All, examining how Human Factors knowledge and methods can support the development of inclusive, accessible, and user-centered systems across multiple design domains. As societies become increasingly diverse in abilities, needs, expectations, and contexts of use, the contributions collected here reaffirm ergonomics as a critical enabler of Design for All, understood not as a prescriptive set of solutions but as a transversal, person-centered design philosophy. Aligned with the vision of the IEA Technical Committee on Ergonomics in Design for All (EinDfA), this issue emphasizes the role of ergonomics in integrating real users, addressing expressed and unexpressed needs, and translating inclusivity into measurable, evidence-based design outcomes. Across diverse contexts, ranging from transport infrastructures and healthcare systems to homes, schools, museums, natural landscapes, and cities, the articles converge on a shared premise: inclusion is not an ancillary design goal but a foundational quality that emerges through the integration of ergonomic knowledge, participatory processes, and attention to human diversity. Rather than treating accessibility or usability as isolated requirements, the works presented here frame design as a relational process shaped by interactions among people, environments, technologies, and organizational structures. The contributions collectively articulate an advanced understanding of inclusive design as a systemic, evidence-based, and human-centered practice. However, four interrelated thematic clusters emerge, highlighting convergent issues, methods, and design implications.

ERGONOMICS AS A DRIVER OF INCLUSIVE, SYSTEMIC, AND SERVICE-ORIENTED DESIGN

Two articles foreground the role of ergonomics in reframing design problems at the systems and service levels. John Harding's contribution on inclusive service design thinking in underground transport environments exemplifies this shift by positioning stations as socio-technical systems in which spatial configuration, movement dynamics, and user experience are deeply interconnected. By transferring Service Design methodologies into the built environment and supporting them with empirical studies and modeling tools, the paper demonstrates how inclusivity can enhance both service quality and operational efficiency without increasing costs or spatial demand. A comparable systemic perspective is developed by Lara Pulcina in her analysis of inclusive design methodologies in healthcare. Here, inclusion is framed as a structural and cultural transformation toward person-centered systems that

Attaianese, E. (2025). Ergonomics and design for all: enhancing inclusion through human-centered design. *Rivista Italiana Di Ergonomia*. 31. I-III. DOI: 10.6093/RIE/12731

integrate methodological, organizational, and relational dimensions. In both contributions, ergonomics serves as an enabling framework that supports decision-making in complex contexts, reinforcing inclusion as a strategic design value rather than a compensatory measure.

HUMAN DIVERSITY, SENSORY EXPERIENCE, AND EVERYDAY CONTEXTS

A second cluster focuses on inclusive design by closely engaging with human abilities, sensory experience, and the emotional dimensions of use in everyday environments. The article by Martina Frausin and Giorgia Marialaura Iurilli explores multisensory learning spaces for children with Autism Spectrum Disorders alongside their neurotypical peers, proposing a criteria-driven framework that supports participation without segregation. The emphasis on negotiable, adaptive environments highlights how inclusion can be embedded within shared spaces through careful attention to perception, cognition, and interaction. This focus on everyday inclusion continues in Marthina de Albuquerque Silva et al., who investigate children's appropriation of domestic spaces. Grounded in the Ergonomics of the Built Environment, the study shows that housing design often overlooks children's autonomy and safety and proposes ergonomic adaptations that improve usability without requiring major structural changes. Extending the discussion to technological artefacts, Ester Iacono, Rodolfo Nucci Porsani, and Mattia Pistolesi examine the emotional experience and acceptance of passive exoskeletons in healthcare work. Their findings underscore that inclusive and human-centred design must account for affective responses, expectations, and long-term experience of use, demonstrating that emotional factors play a decisive role in the adoption and sustainability of innovative systems.

CULTURAL ENVIRONMENTS, SPATIAL COGNITION, AND INCLUSIVE COMMUNICATION

A third thematic cluster examines cultural contexts in which inclusion is shaped by spatial intelligibility, communication systems, and experiential continuity between physical and digital environments. Rosita Marchetti's study of the Museo Diffuso Lettomanoppello conceptualizes cultural heritage as an inclusive ecosystem in which accessibility, comfort, and engagement depend on integrating ergonomic principles, participatory processes, and multisensory communication tools. The project illustrates how inclusive design can strengthen cultural identity and participation, particularly in marginal contexts.This cognitive and spatial perspective is further developed by Gianmauro Romagna and Teresa Villani, who propose integrating configurational analysis and agent-based modeling to support inclusive wayfinding in museum environments. By combining predictive spatial analysis with simulations of user behavior, the study demonstrates how an ergonomic approach can inform design decisions that reduce disorientation, improve accessibility, and enhance the overall visitor experience.

MOBILITY, LANDSCAPES, AND THE LIFE-COURSE PERSPECTIVE

The final cluster broadens the scope of inquiry to landscapes and cities, embedding inclusive design within broader spatial and temporal frameworks. Ylenia Di Dario critically reinterprets walkability in natural and peri-urban environments, moving beyond urban-centric indicators toward an ergonomics-

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based understanding of movement that accounts for the physical, sensory, and cognitive variability of people walking. Walkability is reframed as a dynamic condition emerging from person–environment interaction rather than a fixed infrastructural attribute. At the urban scale, Mariangela Perillo, Jeannette Nijkamp, and Erminia Attaianese consolidate research on age-friendly urban design from a life-course perspective, advancing the concept of longevity-enabling environments. By integrating ergonomic principles with technological innovation and green and blue infrastructure, the study highlights how a human-centered approach to urban systems can support well-being, autonomy, and human flourishing across all stages of life.

FINAL REMARKS

Across these thematic clusters, a coherent vision emerges: ergonomics provides the conceptual, methodological, and evaluative foundations needed to translate inclusive design principles into effective, measurable, and sustainable outcomes. The contributions show that inclusion is not achieved through standardized solutions but through adaptive, participatory, and evidence-based processes that attend to human diversity in all its forms. Together, the articles reinforce inclusive design as a critical practice for addressing contemporary social, technological, and environmental challenges, positioning ergonomics as a key discipline in shaping environments, services, and systems that are not only accessible but also genuinely usable, meaningful, and equitable for all.

SHORT BIO

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