

Special Issue on Internet of Digital and Cognitive Realities

Péter Baranyi, Ádám B. Csapó, Anna Esposito, and Atsushi Ito

A Digital Reality (DR) is a high-level integration of virtual reality (including augmented reality, virtual and digital simulations and twins), artificial intelligence and 2D digital environments which creates a highly contextual reality for humans in which previously disparate realms of human experience are brought together. DR has applications in various industries and enhances productivity in both physical and digital domains, leading to the emergence of new social entities and structures such as 3D digital universities, businesses, governance, web-based entertainment, collaborative sites, and marketplaces. The Internet of Digital Reality (IoD) comprises technologies that enable the management, transmission, and harmonization of digital realities in networked environments, prioritizing user accessibility, immersion, and experience through virtual reality and artificial intelligence. Considering the broad societal impact of IoD, papers addressing social and legal aspects of IoD are also encouraged.

The rapid advancements in information and communication technologies, coupled with the increasing capabilities of artificial intelligence, are leading to significant changes in various fields, including corporate management and business. This transformative shift is giving rise to new cognitive capabilities, both natural and artificial, which require a paradigm shift in our understanding and approaches to corporate management and business science. This paper introduces the concept of Digital and Cognitive Corporate Reality (DCR) as a comprehensive framework for discussing these changes, taking into account various scientific disciplines. The paper also provides use case examples to illustrate the advantages of adopting a holistic perspective in DCR.

The second paper turns to self-driving technology. The rapid development of self-driving technology has not yet led to widespread adoption of self-driving cars. As a result, with an aging population, accidents related to road rage and acceleration and brake errors are expected to persist. Stress is a major contributing factor to such dangerous driving behaviors. Therefore, it is crucial to develop technologies that can provide mental support to drivers when needed. In this study, we focused on the initial step of estimating driver emotions. To achieve this, we developed a technology that collects data on biological signals such as brain waves, heart rate, body movement, and driver operating status while driving, in order to estimate emotions. The authors also introduces the Positive and Negative Affect Schedule (PANAS) to assess the psychological states experienced by drivers. Furthermore, the paper presents

the results of analyzing emotions using PANAS data and data obtained from electroencephalogram (EEG) readings and other biological signals from a car. Additionally, the authors discusses the relationship between this experimental environment and the Internet of Digital Reality (IoD).

This third paper introduces the Spinning Aufheben (SA) method, a novel idea generation approach that utilizes dialectic elements. The method enables infinite idea generation by rotating three elements. The paper discusses the application, model, validity, and social impact of the SA method, along with pilot project results involving 51 university students. The results show that the SA method effectively helped students determine their future career plans, with 46 students identifying their career goals and expressing appreciation for the method's results.

The fourth paper proposes the 'Aegis', an innovative elderly caretaking system. The ageing population presents challenges for countries, including Thailand, in providing quality care for the elderly. Mobile-based applications have potential in aged care, but few cater to the needs of the elderly and caregivers in Thailand. Using design thinking, the authors developed 'Aegis', an innovative elderly caretaking system. 'Aegis' enables effective communication between the elderly and caregivers, improving their quality of life. Usability evaluation with three elderly-caregiver pairs in Thailand showed positive results, emphasizing the importance of user-friendly design. The study provides usability recommendations for intergenerational digital technologies in HCI research.

The fifth paper proposes the Doing-When-Seeing (DWS) paradigm for interface design. The introduction of 2D graphical user interfaces in the 1980s revolutionized user interactions, enabling portable access to digital services with smartphones in the 2010s. These advancements have transformed our understanding of digital information systems, with immeasurable impacts. The current advancements in VR/AR, IoT, and AI are poised to bring about the next leap in cognitive expansion through portable and contextual spatial interfaces, known as Digital Realities (DRs). Users now expect personalized and context-aware engagement with digital content. This paper provides an overview of cognitive aspects relevant to content integration and management in DR environments, proposing the Doing-When-Seeing (DWS) paradigm for interface design. The paper demonstrates the applicability of this paradigm in creating, organizing, and retrieving content within 3D DR environments.

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