# Editorial

## Maria Roussou*

Makebelieve Design and Consulting,
H. Attikou 10, Maroussi,
Athens GR-15124, Greece
E-mail: maria@makebelieve.gr
*Corresponding author

## Maurice Benayoun

CITU, Université Paris 1 Pantheon-Sorbonne, Paris, Université Paris 8,
Saint-Denis, France
E-mail: mb@benayoun.com

**Biographical notes:** Maria Roussou is Founding Director of Makebelieve Design and Consulting, and Adjunct Lecturer at the University of Athens. Previously, she established and directed (1998–2003) the Department of Virtual Reality at the Foundation of the Hellenic World. She began working with VR in 1993 at the Electronic Visualisation Laboratory. Her projects have been presented internationally at events like SIGGRAPH and the Ars Electronica festival (where her artwork *Mitologies* was part of the permanent CAVE® collection). She holds a PhD in Computer Science from the University of London, and an MFA and an MSc in Electronic Visualisation from the University of Illinois at Chicago.

Maurice Benayoun is a pioneering new-media artist working with various media including video, VR, AR, Internet, Blog, urban scale installations and museum design. Among his interactive art installations is the *Tunnel under the Atlantic* (1995), a televirtual project linking the Pompidou centre and the Museum of Contemporary Art, in Montreal. *World Skin, a Photo Safari in the Land of War* (1997) won the Golden Nica at Ars Electronica, in the Interactive Art category (1998). Since 1984, he has been teaching at the Université de Paris 1. He is Co-founder and Art Director of the CITU Research Center, Universités Paris 1 and Paris 8 dedicated to research and creation in the emerging art forms. In 2008, he defended in la Sorbonne, his blog, www.the-dump.net, as a doctorate thesis.

This issue of *IJART* focuses on the interplay of art and the so-called immersive technologies, that is, virtual reality (VR), mixed reality (MR) and augmented reality (AR). For the past 15 years, digital environments that fully or partially immerse their participants in imaginary space have emerged to define an area that blurs the lines between the seemingly different worlds of research, creativity, social and technological practice, while exploring the interdependencies between the virtual and the physical. From the immersive, yet more esoteric, head-mounted display (HMD) and CAVE®-based projects of the mid-1990s to the contemporary open experiences spread out in virtual as well as physical space, creative VR/MR/AR applications are challenging the ways we perceive the world through media art and the science/engineering behind it. Immersion

seems somehow to find a natural completion into mixed realities, realising the "critical fusion" of both: the virtual representation and the physical/social space it intends to decipher.

Early enthusiasm with the use of head-mounted and projection-based display structures, and the development of authoring solutions for application-building, has brought a level of maturity, characterised by the emergence of new technical and the conceptual forms. It is this particular moment in the evolution of immersive VR/MR/AR art practice that this Special Issue of *IJART* has sought to capture. Indeed, the collection of papers in this Special Issue reflects the growing maturity of the field. Not only they are novel ideas being conceived, researched and developed into artworks and applications, as in the previous decade, but also synergies with multiple other disciplines, from the performing arts to neuroscience, are being explored and exploited to a progressively increasing extent. Advances transcend mere descriptions of work and make reference to conceptual frameworks or critical analyses, encompassing both theoretical and empirical perspectives of digitally generated creative spaces.

In the opening paper, 'New media *in situ*: the re-socialisation of public space', Sarah Kenderdine and Jeffrey Shaw address, through examples of five different, yet all situated immersive installations, some of the core issues concerning immersive art: representation, interaction, narrative, the connection between physically located and shared new media experiences. At the same time, they also demonstrate solutions to technological and methodological challenges in the field, such as methods to organise and navigate through multi-modal content from massive databases, to interact with high resolution augmented stereoscopic panoramas and to understand the evolving relationship between human and virtual agents. One of the most fascinating dimensions of VR is its preoccupation with, primarily visual, representation. Kenderdine and Shaw acknowledge this but relate representation to embodiment, emphasising the importance of the sensory, kinaesthetic and phenomenological engagement of the viewer, of inhabitation, physicality, and, ultimately, social agency within virtual environments.

This creative tension between the virtual, the physical and the social self is further conveyed through the work on social actor-agents in interactive MR performances presented by Josephine Anstey, A. Patrice Seyed, Sarah Bay-Cheng, Dave Pape, Stuart C. Shapiro, Jonathan Bona and Stephen Hibit in 'The agent takes the stage'. Their agents literally take the stage, as virtual actors or even robots, alongside human performers, representing humans in virtual space, extending humans in a MR space or acting on their own, as autonomous characters. In the process of discussing these theatrical artistic performances, the authors provide an insight into the choices they have made, as well as a more technical description of the overall architecture they have built for creating such characters.

It is the intermediate space between physical reality and virtuality that Horea Avram's paper 'Intermediary zones: augmented space between real and digital' discusses, focussing on the promising, in the artistic sense, new area of AR. Looking beyond the technology of AR and into its conceptual underpinnings as an artistic practice, the author articulates a philosophical positioning of AR in the context of space (or, rather, of a new 'species' of intermediary, augmented, space), virtuality/(im)materiality and representation (illusionism and trompe-l'oeil). Two examples of AR artworks are being critically analysed to frame the conceptual approach and further the argument of the augmented space – event as a spatial mélange between the real and the virtual that owes its fulfilment to viewers' interactive involvement at both levels.

David I. Tafler and Peter d'Agostino in 'WorldWideWalks: mapping the 'mixed realities' of physical and virtual space-time' define the varying forms of the

contemporary interactive environment (virtual, mixed, hyper, augmented and, even, critical reality) and discuss the significance of the kinaesthetic experience in shaping one's engagement with these worlds. Numerous examples of work from VR and other artistic media – painting, installation, structural film, etc. – are cited to emphasise the role of locomotion in interfacing with the world, both actual and virtual. Specifically, two principal strategies of interfacing are discussed, walking and flying, as key representatives of actuality and virtuality, respectively. From the commonplace physical activity of walking to the abstracted air or cyber travel of flying, the interactive experiences in daily life and in works of art raise critical questions about the structure of experience and about what today becomes a ubiquitous mix of actuality and virtuality.

The final paper of this Special Issue opens doors for readers into a fascinating new area of work, a 'techno-utopian' synergy between art and scientific research where interfaces to the virtual worlds are based on physiological responses and brain activity. Doron Friedman, Ayal Donenfeld and Eli Zafran in their paper 'Neurophysiology-based art in immersive virtual reality' present immersive VR art projects in which participants interact using mind-and-body (best known as brain–computer) interfaces, giving a new meaning to the concept of disembodied presence in an immaterial space through imagination-based navigation. To control ones movement in a VR environment by using thought patterns is not only a novel technological feat, but also a new paradigm for bodily existence where the world around us responds directly to our inner thoughts or emotions, without us taking any physical action. The mind-specific virtual experiences presented in the paper were formulated as art events and laboratory experiments at once, and the outcome was evaluated and analysed scientifically. As would be expected in such a young area, the authors of the papers highlight that it is not easy to create a meaningful art experience that fully exploits the possibilities of biofeedback in highly immersive VR as there are still many unresolved issues.

The goal of this Special Issue has been to bring forth the field of immersive art in its current maturity, presenting the newest developments and exploring its evolving forms. Hence, the collection of papers presented in this Special Issue capture the possibilities, the main advances and the exciting opportunities ahead, aspiring to shape a framework that will help us to develop the next generation of environments.

## Acknowledgements