Editorial of the special issue “Technology and digital art”

Digital art, as it is known in our time, entered the world of art in the late 1990s when cultural institutions such as museums and art galleries started progressively to include digital art installations in their exhibitions to support initiatives in this field. This was the result of some 50 years of previous experiments and seminal works exploring technology and mechanical devices to render artistic creations, a process that started around the 1920s. Artists like Marcel Duchamp and László Moholy-Nagy introduced the concepts of interaction and virtuality in artwork. John Cage has explored the new concepts of automatically controlled randomness and instruction-based algorithms in music composition; pioneers as Grahame Weinbren, Nam June Paik, Michael A. Noll, John Whitney and Vera Molnar, to mention only few names, have explored the concept of random access in audio and computer-generated images.

Digital art applies digital technologies from multimedia, virtual reality, computer vision and/or digital sound with digital storytelling technique in order to create aesthetical channels of communication in the form of interactive installations and digital artifacts. On one hand digital artists consider computer technology as a means of enhancing creativity, and on the other hand, as a final artifact (artistic object).

Accordingly, we define here digital art as “the art that explores the digital medium (tools, technologies and content), as a process or tool for creation, as an end-product (informative content and support) or as an artistic topic”.

It is worth mentioning here that digital art has been evolving as much by the development of science and technology, as by artistic-historical influences. As a matter of fact, certain art circles continue to deny a place for computers in the world of art. In spite of this, nowadays digital technologies are becoming more and more ubiquitous and highly expressive, allowing creative people to create new aesthetical representational forms of information; today we can hardly anticipate its full future expansion.

The development of digital art is essentially founded in four central lead vectors: controlled randomness access; instruction-based algorithmic creation; presentational virtuality; and interaction. Controlled randomness opens up the possibilities of instant access to media elements that can be reshuffled in ostensibly infinite combinations. Instruction-based algorithmic creation is related to the combination of strict rule-based processes, where the instruction is adopted as a conceptual element in the creative process. Presentational virtuality allows the shift from physical objects to the manipulation of pure concepts in the form of “virtual objects” that can become dynamic and volatile, provoking (highly) expressive effects on the side of the observer. This later may assume a more active role as player, when interacting with the artwork itself by exploring new forms of human–machine and human–human interaction and interfacing.

From the point of view of the Computer Graphics community digital art has been considered one of its application areas. The great achievements in Computer Animation of the last two decades and the growing number of worldwide Digital Art and Edutainment fairs and expositions organized in the last years are an indirect acknowledgement of the success of the applications and exploitation of technologies developed within the Computer Graphics community for artistic, educational and entertainment purposes.

Digital art represents the last vanguard where creative people explore technologies together with the combination of new media content and materials, in order to conceive novel aesthetical experiments, to implement innovative expressive information representations, able to generate original sensations and establish new forms of beauty. This issue gives a snapshot of some projects going on in the field of digital art. These works are examples that show the diversity and issues involved in technology and digital arts.

H. Zhou and S.P. Mudur in their paper entitled “3D Scan-based Animation Techniques for Chinese Opera Facial Expression Documentation” present an experimental 3D graphics system for documenting Chinese opera facial make-up and expressions, a work that has been developed over the last 3 years. Chinese opera is one of the oldest dramatic art forms with many different styles that underwent a serious decline, and the exaggerated facial make-up and expressions are the most important elements of this kind of art.

C. Caires in his paper “Towards the interactive filmic narrative. Transparency: an experimental approach”
reflects on the mutations of the filmic narrative, along with
its adaptation to interactivity based on new models of
implementation. A cinematographic experimental project
named after Transparency is presented. Its main goal is to
study the interactive filmic narrative. A prototype under
the form of an installation is described. It allows the
spectators to choose the narrative sequences of the story.
The author concludes the article with a discussion of the
results achieved and future potentialities of interactive
filmic narratives.

R. P. García and J. M. M. Aróstegui present “A
Cooperative Robotic Platform for Adaptive and Immersive
Artistic Installations” which is a novel approach for
immersive artistic installations called POEtic Cubes.
Compared to traditional solutions this approach ensures
short and long-term adaptation capabilities, which allows
artists to configure each installation based on a process of
artificial implementation of auto-organisation. During the
interaction with the installation the user can experience an
adaptation process that, starting from an undifferentiated
initial state, activates a set of cells to auto-organise in order
to construct a multi-cellular organism whose physical
structure (phenotype) is driven by the user interaction.
The interface of the installation is both transparent and
natural, since it is just driven by the movements of the
user’s body, without the need of wearing specific artefacts.

P. Machado et al. dwell “On the Development of
Evolutionary Artificial Artists”. This work envisages the
development of an architecture that is capable of evaluat-
ing aesthetic characteristics of artifacts and of creating
artifacts that obey certain aesthetic properties. The authors
describe the development methodology and motivation, as
well as the results achieved by the various components of
the architecture, while opening up the discussion about the
potential contributions of this type of systems in the
context of digital art.

I. Iurgel and A. F. Marcos in their paper entitled
Required” present the basic concepts, current and future
usages of personality-rich virtual actors while examining
aspects of the authoring process appropriate for virtual
personalities, and distinguishes between their usage as
virtual actors for movies, actor-avatars, assistant actors,
and improvisational actors.

Authors argue that dealing interactively with a digital
personality can reveal a portrait of a real or imaginary
person, and this portrait is a work of art created by an
artist according to his/her creative intuitions. New chal-
enges are posed to the production process and tools that
allow the artistic creation of a digital personality. These are
analyzed and discussed.

Finally, T. Chambel et al. explore new creative ways of
editing and producing videos, using evolutionary algo-
rithms. In their article “Dynamic and Interactive Typo-
graphy in Digital Art” the authors expose a novel form of
generating videos based on evolutionary algorithms: New
video sequences are combined and selected, based on their
characteristics represented as video annotations, either by
defining criteria or by interactively performing selections in
the evolving population of video clips, in forms that can
reflect editing styles. The authors argue that with evolving
video, the clips can be explored and discovered through
emergent narratives and aesthetics in ways that may reveal
or inspire creativity in digital art.

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reviewers who have offered their precious help in the
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Between November 1997 and October 2005 he has been
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In this position he has leaded the transfer and establish-
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On behalf of CCG he received the European IST Prize
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Dr. Marcos has been the (co)founder of the following
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respectively; and the Artech series (International Confer-
ence in Digital and Interactive Art) with a first edition
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In this position he has been responsible for the design of a
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He is the author and co-author of more than four dozens
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He is the co-founder and co-leader of the Graphics and Multimodal Systems Group at CCG, a research interest group aggregating researchers from the areas of Computer Graphics, Perception, Color Technologies, Digital Arts, Edutainment, Information Visualization, Virtual and Mixed Reality and their applications.

He has collaborated with developing countries since 2000 by participating in a joint master course in information systems between the University of Minho and ISCTEM (Institute Superior de Ciências e Tecnologias de Moçambique), Mozambique. This course had two editions. He is also coordinator of the Asia-Link project “Staff and Institutional Development for the National University of East Timor” started in June 2005.

He integrated the Executive Board of the Eurographics from January 2002 to August 2005. Since July 2002 he is a member of the Executive Board of the Eurographics Portuguese Chapter. Since 2000 he is an elected member of the Advisory Board and Board of Trustees of the INI-GraphicsNet Foundation.

Since 2000 he became a regular consultant of Agency for Innovation, the European Association INTAS, European Commission and ZGDV (German Institute for Computer Graphics, Darmstadt, Germany). He is a member of ACM, IEEE and SIGGRAPH.

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