

art-E-fact: A Generic Platform for the Creation of Interactive Art Experience in Mixed Reality

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German Abstract

Innerhalb des Projektes art-E-fact wird eine generische Plattform entwickelt, die Künstler, Autoren oder Mediendesigner dazu einlädt, aktuelle Technologien aus den Bereichen Digital Storytelling, Mixed Reality oder Multimodalitäten zu nutzen und interaktiv neue künstlerische Ausdrucksformen zu erkunden. Mögliche künstlerische Ausdrucksformen können neben klassischer Malerei oder Architektur beispielsweise moderne Foto-, Video- oder 3D-Modellierungstechniken in AR/VR-Welten enthalten.

art-E-fact wird als interdisziplinäres Forschungsprojekt des IST-Programms der EU durchgeführt und startet im Herbst 2002. Das Projektteam setzt sich u.a. aus Informatikern, Mediendesignern, Künstlern, Kunsthistorikern, Restauratoren und Marketingagenturen zusammen. Die Projektergebnisse werden in verschiedenen Workshops, Kursen und in Form einer Experimentierplattform fachspezifischen Anwendergruppen als auch auf Ausstellungen der Öffentlichkeit präsentiert.

With the *art-E-fact* project, an interdisciplinary team of computer scientists, media designers, artists, art historians, restorers and media publishers is striving for a new level of convergence between the arts and technology. The project will create a platform for developing and exploring new forms of creation, presentation and interaction with various kinds of artistic expression. Digital storytelling and mixed reality technologies will create new dimensions for artistic expression, thus building the foundation for new artistic applications.

In fact, digital storytelling in a mixed reality environment consisting of virtual autonomous characters, multimedia, physical props

and devices, and multi-modal, human-oriented interactions has to be seen as both a new »medium« for the communication of informational content and a new form of art. However, there are still numerous obstacles facing artists and designers wishing to access the innovative tools for the creation of, or even experimentation with, mixed reality and digital storytelling. There is a considerable gap between the marketable creation technology that is used in art and design classes and state-of-the-art multi-modal interaction technology and autonomous animation. With its interdisciplinary team, *art-E-fact* is going to explore ways of building bridges to allow artists to more

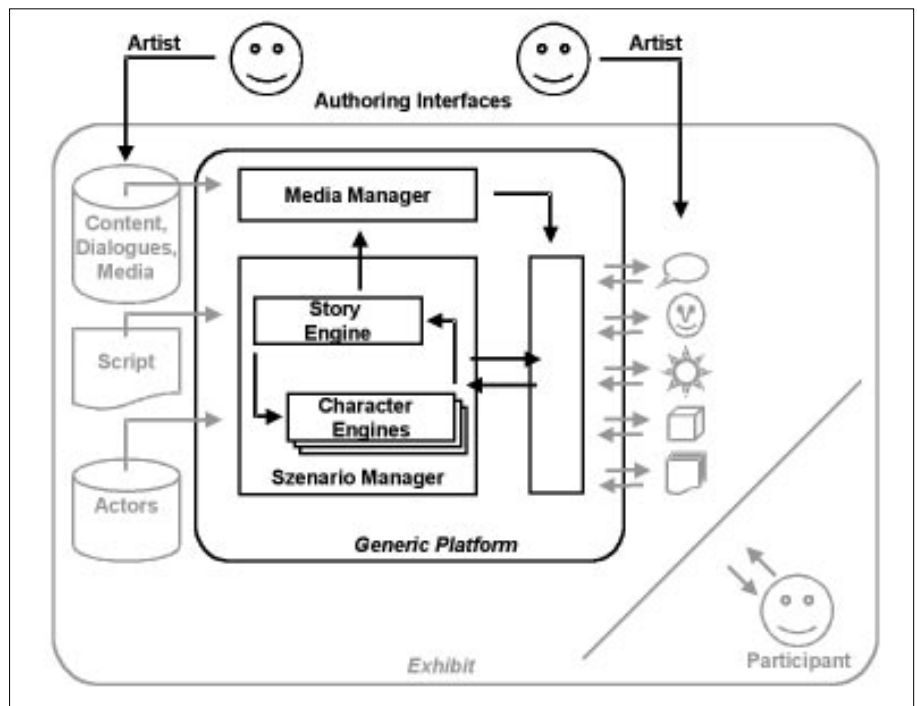


Figure 1: Generic platform (black, including authoring interfaces), to be used by artists who create an exhibit (grey), which is an interactive storytelling application in Mixed Reality

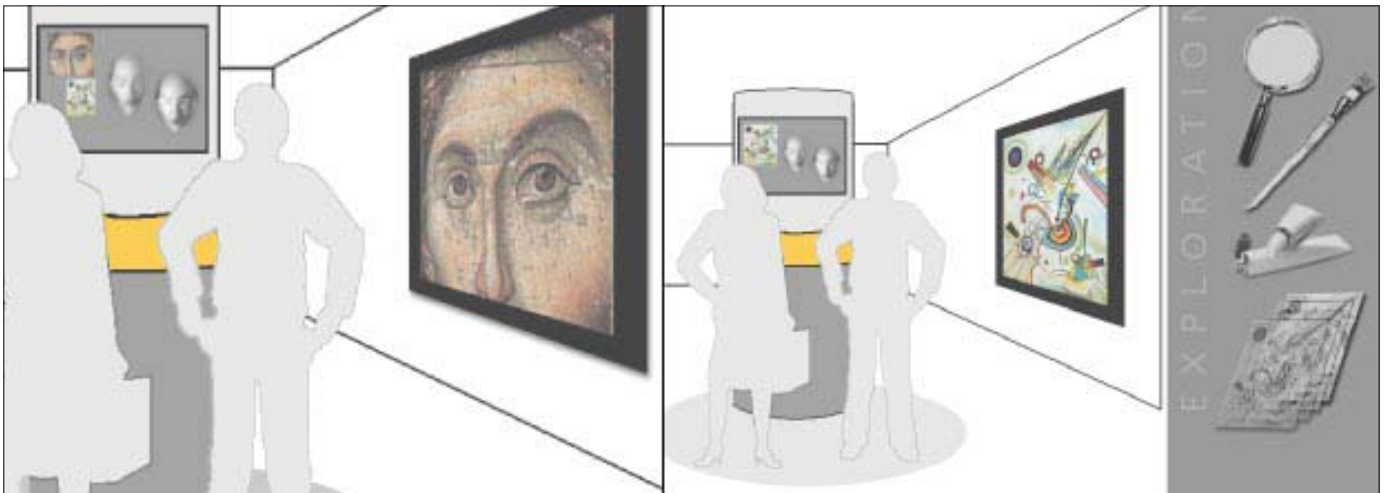


Figure 2: Sketched installation concept of visitors having conversations with virtual philosophers on the screen (left), with various options for physical props to interact (right).

easily access innovative technologies such as digital storytelling and mixed reality and make them applicable to their artistic discourses and expressions.

The main objective of the *art-E-fact* project, therefore, is to develop a generic platform for interactive storytelling in mixed reality that allows artists to create artistic expressions in an original way, within a cultural context between virtual («new») and physical («traditional») reality. The platform will be used as a foundation to actually build a compelling mixed reality installation that facilitates access to a knowledge base of inspirational art history material - reflecting the way humans have created art for at least the past 4000 years. Since the platform addresses artists in particular, it is essential to involve artists and the analysis of artistic methods right from the beginning of the project and through all project phases. As proof of the concept, a showcase will be created within an interdisciplinary team. This can be used for the evaluation of artistic methods, as well as for the diffusion and exploitation of the results, leading to more accessible tools for artistic expression in the future.

Generic platform for interactive storytelling in mixed reality

The generic platform for artistic creation in mixed reality is based on a kernel that combines a virtual reality system with a scenario manager for interactive conversations with partially autonomous virtual characters. Furthermore, components for media management and abstract device management enable flexibility and allow authors to design multi-modal interactions on various abstraction levels.

Artists will create a mixed reality exhibit by using the generic system to shape a specific instance of expression. They will choose specific interaction devices and physical props to be used for anthropomorphic interactions, as well as corresponding interaction metaphors; they will define dialogues with a degree of autonomy and the behavior of virtual characters, and they will create multi-media elements to be accessed during runtime.

For production issues, the «artist» is considered to be an interdisciplinary team of writers, visual artists, hardware prop designers, programmers, etc. Artists and designers can access the system at different layers of influence detail. Those who have more advanced knowledge of

procedural behavior descriptions and 3D animation can define rules and every detail of the result. Other authors can simply script dialogues on a higher level of abstraction.

In brief, the sketched generic system serves as an experimental platform allowing authors with artistic or humanistic backgrounds to make design decisions which go beyond state-of-the-art creation systems for digital media. Examples include:

- Providing interactive storytelling dialogue structures instead of «navigation» metaphors in hypertext structures.
- Enabling the design of holistic spectator experiences by integrating design issues concerning content, story, characters, their modalities and the hardware used instead of being constrained to mere screen design with a fixed interaction metaphor.

In summary, it is possible for artists to include anthropomorphic interactions such as speech, gestures, eye gaze and body poses into their mixed reality design and to direct lifelike avatars in order to act.

Exhibit as a case study

Within the project, an exhibit will be built that will serve as a case study and proof of concept to accompany the tool-building work through all phases of the creative production process. At the end of the project, the exhibit will be presented to the public. The exhibit should provoke intellectual discussions on the artistic process itself, focusing on mixing realities. Through the cooperation of renowned institutions from the fields of art history, art restoration, artistic creation and multimedia design and technology, a mixed reality art piece will be built that, in and of itself, »is« an interactive, contradictory discourse with different points of view about artistic creation. The basic scenario is briefly summarized in the following:

Spectators will be confronted with real historic paintings, such as Byzantine icons or western contemporary art, and will participate in a virtual discussion about them. A virtual character in the role of the analyst will present knowledge about its creation that is physically derived from the discussed real artifact through multi-level spectral imaging methods.

A different character takes the role of an art historian who builds the bridge from past expression techniques to modern techniques. Further virtual characters can be involved who take roles to either provoke reactions from visitors or ask questions in place of them. Spectators become participants as they interact with the characters and the paintings through anthropomorphic metaphors such as speech, gestures and physical props.

The virtual beings themselves, embedded in an electronic art piece, are in a recursive sense »artistic creations« and will be subject to careful design in the creation process. The resulting aesthetics, particularly in the context of the degree of confrontation involved, result from thoroughly elaborated details.

The joy of philosophical recursive reflections on art and art theory is a key motivation for the piece. The »artifact that discusses artifacts« bridges 4000 years of human art creation, motivation, materials and spectator interaction.

Finally, the resulting exhibit can also be seen as an example of educational software. It employs a method of presenting knowledge based on hermeneutics, making use of the Greek philosophers' dialogue, by distributing several interpretations across different characters.

The *art-E-fact* project is one of the selected proposals of the Cross Platform Action 15 of the IST program. It is supported by the European Union and will start in September 2002 with a Europe-wide consortium consisting of ZGDV e.V., Fraunhofer IGD, Sacred Convent of the Annunciation IMSP, Akademie der Bildenden Künste Vienna, VICOMTech, Centro Arteleku, Parque Tecnológico de San Sebastian and Giunti Multimedia SRL.

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