

Spatial Applications of Multimedia on Exhibition Halls by Decentralized Control and Multivariable Systems & Related Appliance Works

PELİN YILDIZ

THE DEPARTMENT of INTERIOR ARCHITECTURE and ENVIRONMENTAL DESIGN
HACETTEPE UNIVERSITY
FINE ARTS FACULTY, BEYTEPE CAMPUS
TURKEY

Abstract: The artificial intelligence in relation with the interior architecture of the exhibition halls are the places with computer aided organizations as contemporary usages of flexible places supplied by decentralized systems. Recently the art of presenting is being identified under the circumstance of artificial intelligence adapted to interior organization presenting the high-tech atmosphere of any space in a multivariable aspect. The high tech meaning underlies the technical necessities with the aesthetical practice work and interactive space formation. The multimedia is the artifact of the virtual reality that is the main and basic creator of the atmosphere. The multimedia is essential in the synchronization of the virtual reflection by computational facilities which will be identified with some samples from the world. As a sample the *International Fair and Exhibition Hall* in Istanbul, Turkey by technical integration is being evaluated.

Key Words: - Artificial intelligence, decentralized system, multivariable systems, interactive space, virtual reality.

1...Introduction

In the current period and conditions the technological revolution and newly invented technologies are being adapted to our ordinary life styles in most of the cases. Human communication has come a long way. It has traversed a path from cave paintings (single mode) to present day multimedia (multi-mode). The development of technology, which has the capacity to integrate different media; has in the process, generated the possibility of making the process of communication for the developer (sender) and user (receiver) a richer experience [14].

Communication technology has been history's driving force. To support human communication, the electronics industry has made significant progress in telecommunication, consumer & entertainment electronics and computers [15].

A further contribution of AI could be identified in the aspect of technology integration. The AI system will use an integrated and inter-operable information base for representing all relevant aspects of the environment. This information base contains all multimedia information needed for the interaction with the users, as well as the layout information needed for navigation tasks. The problem of an integrated model of the environment serving different tasks of the robot, e.g.

navigation tasks, scheduling tasks and interaction with users, is still an open issue [16].

Three recurring themes have dominated these discussions: the role of electronic media in what is seen as a "third evolution" in methods of museum exhibition (following those at the turn of the last century and in the 1950s and 1960s); the nature and effects of interactivity in contemporary museum exhibit design, and the tension between the museum as a site of uplift and rational learning as opposed to one of amusement and spectacle. While a great deal of research is yet to be done on the implications of electronic media on museums, a striking feature of contemporary debates is the sense of reaction found in the historically separated reactions to issues of modernization, interactivity, and the tension between different disciplines [15].

The electronic media have assumed an ever greater presence in museums of science, technology, natural history, and art. Corporate sponsors and donors of presentation technology are interested in new media for their own reasons; with their logos emblazoned on interactive kiosks and published gallery guides, corporations have been increasingly active in sponsoring shows, specific gallery spaces, or donating equipment [14].

Despite its embrace by exhibition professionals and visitors alike, the growing prominence of digital media in exhibition design has also provoked a sustained

and sharp debate within performing circles. This debate takes up the impact of electronic media on traditional notions of authenticity regarding the museum artifact; the effect of multi-media on museum access; ownership of artifacts; and professional ethics; and the relation of electronic media to traditional sources of knowledge in museums such as labels, and printed guidebooks.

2 Multimedia Regarding Artificial Intelligence by Exhibition Halls on a Multivariable Aspect

The exhibition halls are contemporary spaces having the feature of multidimensional aspect. The variable and flexible usages of interiors are the highly technological donated places that are dominated by artificial intelligence.

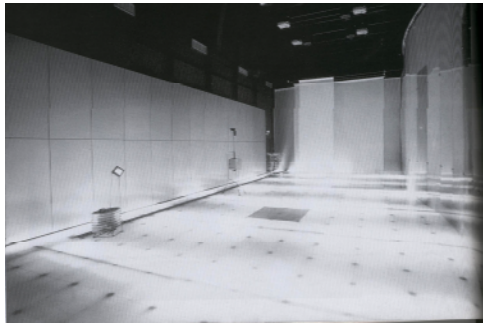


Figure 1: An exhibition hall with the real atmosphere while not active

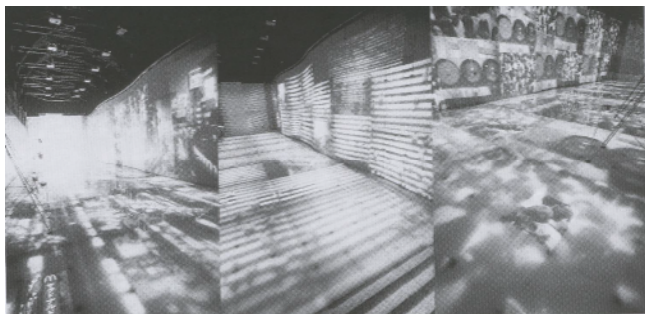


Figure 2: The exhibition hall with the artifacts of AI surrounding the whole.

The artificial intelligence means futuristic solutions of the interior with technical data. The conjunction of acoustics, lighting, virtual images are all in a decentralized formation. This variability performs the language of computer interaction in design principles which could then be called as artificial intelligence in space.



Figure 3: The same exhibition hall under the essence of the tools of AI like multimedia adapted to design work.

The integration of artificial intelligence in exhibition halls ends up with the above features of the space with contemporary usage;

- Virtual reality of space,
- multidimensional usage,
- interactive space,
- artistic approach of technological adaptations,
- the unknown quantity of time in the space,
- less effort & more efficiency in design organization etc.

The AI adapted to space is mainly progressed under the issues like;

- computational hardware in relation with the space,
- the multimedia affection supplied by the computer aided facilities,
- the variable places according to the changing of the projection in the whole atmosphere of the hall

Time is an important constant in the design work as the synchronization is the basic point of AI. AI is the main organizer of time synchronization under above circumstances:

- the reflected visual image in synchronization with lighting, sound regarding variable usage,
- the virtual atmosphere surrounded the space by multimedia,
- creating the system synchronization of interior.
- the interactivity of the space also by media to provide easy access to the live performance.



Figure 4: AI adapted to design is an interactive usage of the aesthetical spaces with different usages and flexible means which is supplied in a very short time according to time synchronization.

The usage of the computers remained confined to data processing, information systems, physical process modeling and control applications. With the increased processing power and storage capacity, a new communication medium has become available. Computer based “Interactive Multi-media” is currently facilitating the simulation, extension and integration of various communication technologies to facilitate multi-sensory communication and learning [15].



Figure 5: The different effects of the same interior

Technologies are not mere exterior aids but also interior transformations of consciousness. The form and the structure of the discourse have been influenced by the affordances of different tools. All communication technologies have their strengths and weaknesses that are gradually realized after some years of initial experimentation with the technology as a communication medium. It took several decades of book printing for a useful and generally acceptable book form to emerge out of the tradition of costly medieval manuscripts. Interactive multi-media technology also will soon be able to create a niche place for itself out of the legacy of the earlier media [15]. Computers offer interesting novel possibilities of interactivity and of

integration of data, information, analytical interpretations and creative expressions. The issues being addressed by researchers and practitioners engaged in the area of Interactive Multimedia can be broadly abstracted as follows:

- Recording, rendering, transmission, storage and retrieval of multimedia data, information, analytical interpretations & creative expressions.
- Synthesis of multimedia information, analytical interpretations & creative expressions.
- Analysis of multimedia data, analytical interpretations & creative expressions.
- Design and development of multimedia communication systems [15].

Digital technology is helping us to redefine the notion of the design work, a static and linear collection of limited visual content to a dynamic and non-linear corpus of large body of multimedia content. Computers ability to store large volumes of instantly available data, to represent any structure or behavior, and, to integrate multiple elements are three underlying strengths on which the interactivity is based upon. Effective mechanisms have been proposed to facilitate uniform and quick exploration, rendering and analysis [15].

3. Samples of Appliances as Decentralized Systems

Multimedia data are pre-eminent and prominent parts of information systems nowadays. The extensive progress in hardware and software technologies has led to the storage and management of huge amounts of multimedia data in database systems. Although multimedia data is a widely used aspect of information systems, multimedia database applications rely on traditional approaches to retrieve the data [16].

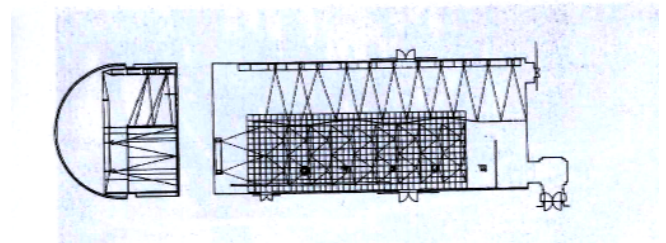


Figure 6: The plan view of the exhibition hall



Figure 7: The exhibition in the hall with AI as multimedia regarding artistic work. The objects are tied from the ceiling and have the feature to reflect images that are changing [3].



Figure 8: The objects are the elements of the interactivity of the space [3].



Figure 9: An object



Figure 10: Side view [3].

The keyword based information discovery methods provide search and retrieval facilities for multimedia objects, but, there is a wealth of contextual and semantic information hidden in the content of multimedia objects which may not be addressed by keyword searches. Artificial Intelligence AI techniques provide a means to extract and analyze content-based information and retrieve the implicit data in multimedia objects. The feature detection algorithms for content-based retrieval (based on color, texture for image data and etc.), structure analysis (based on shapes and spatial features and etc.), and automatic annotation of semantics in multimedia data are examples of using AI techniques in multimedia database applications [16]. The application of AI techniques in multimedia databases allows

database developers to investigate the relationships amongst multimedia objects and to provide a way for representing the semantic information in these databases. This content based representation provides effective and easier interpretation as well as search and retrieval mechanisms for multimedia database contents. An intelligent presentation generation is also another emergence of AI techniques in multimedia database applications. Intelligent presentation process generates the presentation structure based on the semantics and express how the objects will interact with each other to provide understandable and efficient presentations. In this work we can see AI techniques, multimedia database systems, multimedia data modeling; content-based multimedia representation and presentation generation systems. The primary focus is on content-based multimedia representation projects and the efforts in providing intelligence in hypermedia presentation generations [16]. By exhibition halls, not only the images and accompanying information of the digitized collections are meant but also the "aura", the living and changing space where other humans are present [13]. There is no doubt that currently access to cultural heritage is limited, enjoyed mostly when physical presence in the exhibition premises can be possible. At the same time, it is common understanding that alternative ways should be developed in order to provide such services for remotely located exhibits.

Technological advances in various fields have made it possible to envision such immersive, tele-presence applications; the current project exploits fully related technologies to provide an integrated solution for the particular case of exhibition places [13]. AI in exhibition halls by multimedia appliances allows virtual user presence in an exhibition, constitutes a contribution in a number of areas: interfaces for mobile agent tele-control; navigation technologies; multimedia presentation systems. Such areas are deemed essential for the evolution of a new generation of remote access technologies that built upon existing network infrastructure [13]. The Internet is a very fast evolving technology that electronically connects distant sites; however, up to now, electronic networks serve mainly to exchange and acquire information. In some cases this information is pictorial by means of images taken in "real time" with a stationary Web-camera. To take full advantage of a network such as the Internet, it would be desirable to get real physical interaction with the remote site being visited.

Robots, and especially mobile platforms, can extend the Internet towards an interactive platform that allows actions to be carried out and dynamic information to be exchanged between distant sites [13]. The field of mobile robotics has made serious progress in the recent years. The technology has reached a state that allows the

development of mobile robot systems, able to operate autonomously in human environments over long periods of time, without human supervision. Until today, only laboratory experiments have been carried out, illustrating the capabilities of the developed control systems.

The innovative aspects of AI by multimedia include technological and conceptual novelties. AI capitalizes on relevant technologies to contribute to developments in remote access to cultural heritage. The next step in this evolution chain seems to be the provision of facilities for active physical exploration of distant sites. AI presents a real innovation in this aspect, by introducing this concept in museums and exhibition centers. Information society, in the dawn of the third millennium, advances far beyond the mere use of technology in well-established application areas (i.e. banking, booking, office automation, etc), by incorporating novel models of information access and management. With a clear focus on user-friendliness, accessibility of technologies to the broader public, and integration and convergence across information processing, communication and media, research and development efforts are addressing conventional applications under a new perspective [13].

Multimedia by A I. assists the globalization of the access to cultural exhibits, by capitalizing on established technologies, to provide tele-presence in distant exhibition halls' premises and personalized visit of the exhibits [13]. The mobility of the robot allows Web visitors to choose a wide variety of view-points and enjoy tele-presence in the museum. Therefore, it provides the means to overcome the barriers of distance, limited time and restricted mobility of potential users, offering them the possibility to visit the interior through a robotic medium. Besides, increased interaction capabilities with the exhibits themselves are offered to the user, which may be useful when visiting a science or technology museum. In addition to this increased interactivity, the robotic avatar can deliver high-resolution images over the Web, being thus extremely beneficial to professionals and specialists [13].

Therefore, technological advances are seamlessly assimilated in everyday activities. [13]. The possibilities of new paradigms in providing access to cultural exhibits offered by the information society are developing fast. In recent years we are witnessing a gradual adoption of media-technologies in various aspects of the sector, such as digital document preservation, media- and Web-presentation, graphical animations, etc. The advent of such technologies contributes towards providing media-rich presentations of cultural exhibits and consequently offering better services to museum visitors. Lately, Internet and Web-based technologies are also employed, for providing access mostly to images of exhibited objects [16].

4 Samples from Turkey

The sample from Turkey is the International Fair and Exhibition Hall in Istanbul. The fairs and exhibitions in this place are under the affect of multimedia synchronization.



Figure 11: The interactive presenting place with 3 dim. view.



Figure 12: The reflected image on the screen.

The feature of the artificial intelligence in this area is identified as:

- the virtual atmosphere,
 - the multimedia surrounded the interior by presenting facilities in synchronization with time,
 - the multidimensional space usage,
 - the interactivity in place etc.
- the timing, performing and presenting facilities are mainly the general image of this space.



Figure 13: The performance area Figure 14: The screen with projection



Figure 15: The fair centre



Figure 16: The fair centre with variable ambience

Artificial intelligence, or AI, is a field of computer science that attempts to simulate characteristics of human intelligence or senses. These include learning, reasoning, and adapting. This field studies the designs of intelligent agents, or a system that acts intelligibly. The term artificial intelligence is confusing and misleading however. Artificial intelligence is still a form of intelligence, but perhaps “synthetic intelligence” is a better name because it is not natural intelligence [17]. This is why the name “computational intelligence”, or computational intelligence, is sometimes preferred. Artificial intelligence is used in many objects that we use in our current life styles: cars, microwaves, personal computers, and videogames. There are many different goals for AI, depending upon your field or view. Computer science attempts to make computer systems do what only humans could do in the past. Computational philosophy tries to understand human intelligence at a computer level. AI also has applications in medical programs, factories, robots, and many other tasks. There are several different disciplines of artificial intelligence. They are: different are expert systems, natural languages, simulation of human sensory capabilities, robotics, and neural networks. These disciplines are all unique and are often implemented together to do more complex and advantageous tasks [17]. Traditional methods of search and optimisation are too slow in finding a solution in a very complex search space, even implemented in supercomputers.

5 Results and Conclusions

The results of this study are:

Multivariable systems are flexible components of high tech appliances controlled by decentralized order. The multivariable usage is the technical and aesthetical ability of cooperated system regarding virtual reality.

The evolution on the exhibition hall facilities by multivariable approaches using the tools of artificial intelligence.

The artificial intelligence adapted in space is the automatic control and flexibility of the organization.

Every piece is tied to each other in a complicated theory. The presentation process is the synchronization ability of these pieces which is a result of artificial intelligence that could also be called as automatic control mechanisms.

The **conclusion** of this study identifies that the **advantages** of the integration of AI in the areas having the function of exhibition, are the interactive and dynamic space expression with high-tech facilities while the **disadvantages** could be the possibility of these appliances coming more forward then the product being exhibited. So the designer should carefully balance the technical and aesthetical necessities in good synchronization. The multivariable systems could be identified in a large basis of disciplines. One of these disciplines is the artistic feature of multimedia on architectural appliances.

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