The Interactive Approaches of Exhibition Halls by Computational Facilities

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Abstract— The computational facilities in relation with the interior architecture of the exhibition halls are the places with computer aided organizations as contemporary usages of flexible places. Recently the art of presenting is being identified under the circumstance of multimedia supplied by computerized atmosphere adapted to interior organization presenting the high-tech quality. The interactivity underlies the technical necessities with the aesthetical practice work and interactive space formation. The multimedia in exhibition halls are the structure of virtual reality. 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. In this study the variable approaches of exhibition activity with computer aided systems are being identified. In the results and conclusions parts it is declared that art and the reflective quzntities are not only by manual presentation techniques but also by technical distinctions.

Key Words—Computational facilities, exhibition halls, multivariable systems, interactive space, virtual reality.

I INTRODUCTION

Automated design generation tools are not adequate for many problems in architectural design for several reasons. Architectural design involves subjective decisions about aesthetics, human traffic patterns, and other preferences that are difficult to model or quantify mathematically. For design qualities that can be well defined, it is often difficult to foresee all issues that may affect the optimization model before observing some results [19].

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 [15].

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In addition to modeling issues, automated tools face computational difficulties. Currently, methods that can compute or verify the global optimum of a function involve systematic exhaustive search with some kind of tree-pruning or stochastic methods. For large problems,these methods fail to perform adequately in a reasonable amount of time. Allowing the designer to use experience and intuition to guide the search can improve search time relative to well-defined objectives and constraints as well as to take into account unmodeled objectives and constraints. The designer can also assist gradient algorithms that may have computational difficulties related to non-smooth objective and constraint functions by guiding the design away from first-order discontinuities [19]. 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 [16]. 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 [17].

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 [16].

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 [15].

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.

II EXHIBITION HALLS BY COMPUTATIONAL FACILITIES

The interactive design tool allows the designer to add, delete, and modify objectives, constraints, and Units during optimization to refine the problem definition. The designer can set up the initial problem and start optimization. At each iteration, the current design is displayed. The designer can watch how the design is changing and use that information to change the problem definition at any point during the optimization. This is useful because design is an iterative process for the designer as well as for the algorithm [19].

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.

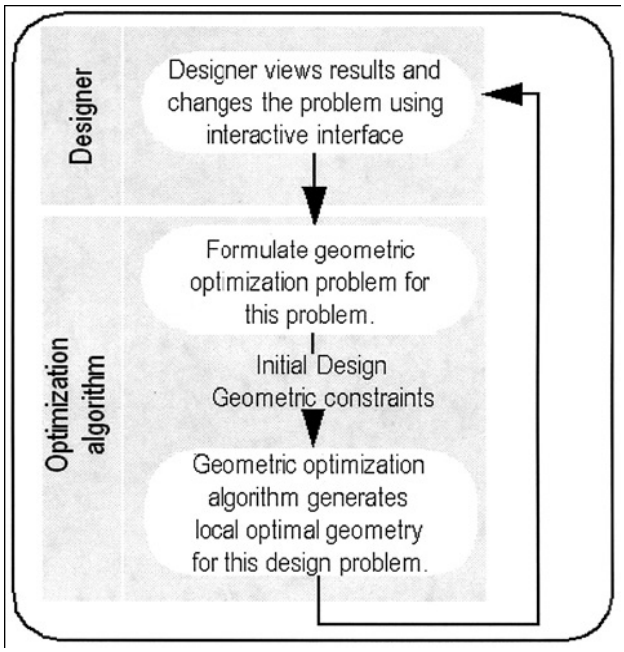

Figure 1 Interactive building layout optimization method. The designer uses feedback from the algorithm to refine or change the problem definition and guide search.

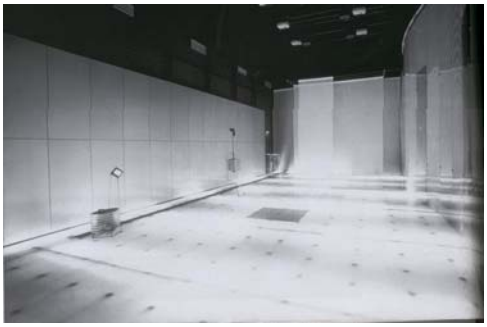

Figure 2: An exhibition hall with the real atmosphere while not active

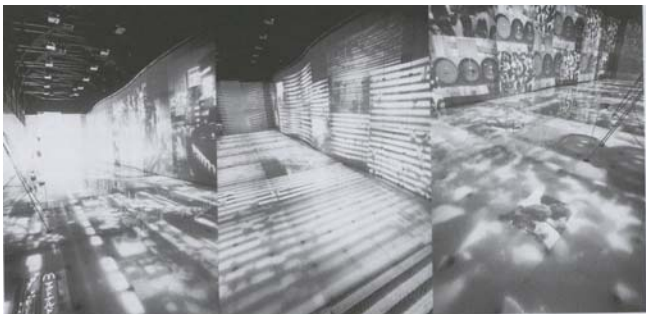

Figure 3: The exhibition hall with the artifacts of AI surrounding the whole.

The computational 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.

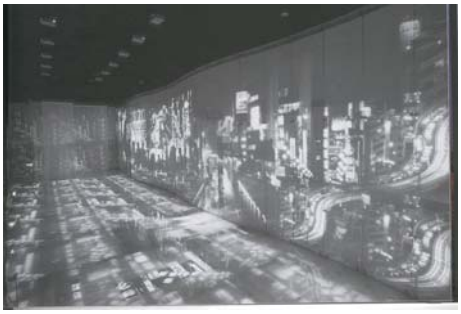

Figure 4: The same exhibition hall under the essence of the tools like multimedia adapted to design work.

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 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. Programming 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.

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 [16].

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 [16]. 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 [16].

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 [16].

III SAMPLES OF APPLIANCES AS DECENTRALIZED SYSTEMS

With the ability to modify design variables during search, the designer can guide the optimization process. Because the design variables are geometric in nature, the designer can interact with the variables in an intuitive way. If the designer sees the design moving into an undesirable area of the design space, s=he can intervene and force search into a new area of the space by manipulating Units. This method uses the designer's experience and intuition to guide global search along with the efficiency and accuracy of gradient algorithms to direct local search [19].

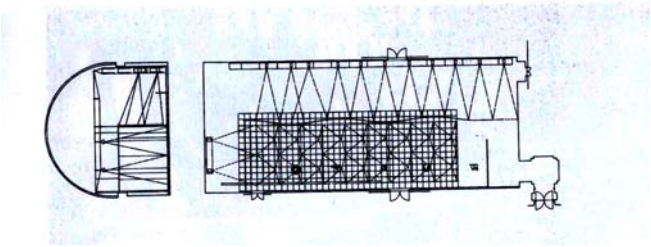

Figure 5: The plan view of the exhibition hall

Figure 6: The exhibition in the hall with AI as multimedia regarding artistic work. The objects are tied form the ceiling and have the feature to reflect images that are changing [3].

Figure 7: The objects are the elements of the interactivity of the space [3].

Figure 8: An object

Figure 9: 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 [17]. 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 [17]. 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 [14]. 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 [14]. 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 [14]. 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.

Multimedia 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 [14]. 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 [14].

Therefore, technological advances are seamlessly assimilated in everyday activities. [14]. 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 [17].

IV 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 10: The interactive presenting place with 3 dim. view.

Figure 11: The reflected image on the screen.

The feature of the organization 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 12: The performance area

Figure 13: The screen with projection

Figure 14: The fair centre

Figure 15: The fair centre with variable ambience

Interactive Design Exploration: The interactive layout optimization tool can be viewed as an interactive sketchpad for exploring design alternatives. As a typical procedure, the designer would

1. Defining Rooms and Halls: Define which Rooms will be included in the building and what are acceptable sizes for each Room (length, sq. ft.).
2. Moving Rooms into Rough Location: Rough dimensions also can be set by stretching.
3. Defining Connections: Add Access ways to define which Rooms will be connected.
4. Choosing an Objective: Choose an objective to optimize for.
5. Adding Additional Constraints: Add any special constraints besides those added by default.
6. Optimizing: The optimization algorithm will compact the geometry into a locally optimum layout.
7. Examining Results: Check results visually and check estimated performance values calculated by the objective function.
8. Iterating: Use information to refine the problem definition or guide search into a new area [19].

V 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 computer intelligence.

The computational 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 virtual reality that could also be called as automatic control mechanisms.

The **conclusion** of this study identifies that the **advantages** of the integration of computational facilities 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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