First Interdisciplinary Conference of The International Society of the Arts, Mathematics and Architecture, ISAMA 99

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Overview of the conference

The first interdisciplinary conference of ISAMA 99 was held in San Sebastian, Spain, June 7-11, 1999. The conference directors were Nathaniel A. Friedman, SUNY (State University of New York), Albany, USA, and Javier Barrallo, Universidad del País Vasco, San Sebastián, Spain. The main purpose of this conference was to bring together persons interested in relating mathematics with the arts and architecture. This set included teachers, architects, artists, mathematicians, scientists and engineers. ISAMA focussed on the following fields related to mathematics: Architecture, Computer Design and Fabrication in the Arts and Architecture, Geometric Art and Origami, Music, Sculpture and Tesselations and Tilings. These fields included graphics interaction, CAD systems, algorithms, fractals and mathematical software like Maple, Derive, Mathematica, etc.

The International Scientific Committee was formed by twelve scientists, including the author of this report. Sixty-four papers were presented and published in a beautiful volume, edited by the Department of Applied Mathematics, School of Architecture, University of the Basque Country, ISBN 84-930669-0-7. There was a one day excursion to Gernika, where we could admire the monumental sculptures by Henry Moore and Eduardo Chillida, the world's foremost sculptor born in San Sebastián, whose work is inspired by architecture. In the afternoon, we made a tour of the Guggenheim Museum in Bilbao, designed by Frank Gehry, which is a crowning achievement of contemporary architecture. Fortunately, at this time there was also at the Guggenheim a magnificent exhibit of Chillida's work as well as the widely known architectural sculpture by Richard Serra, inspired by elliptical forms. Three other highlights at ISAMA 99 should be mentioned. They are the excursion on Thursday afternoon to the wonderful Chillida's private sculpture park Zabalaga, the world premier of "A Flame In Flight" for solo violinist by Robert Cogan, performed by Michael Appleman, and the granite sculpture "Oushi-Zoukei" carved by Keizo Ushio during the conference.

Without doubt, the goal of sharing information and discussing common interests to enrich interdisciplinary education, was achieved. Finally, we missed the presence of our friends from Yugoslavia, in particular, Slavik Jablan, who was present at the successful conference Mathematics & Design (M&D-98) held also in San Sebastian, Spain, June 1-4, 1998.

Papers related to architecture and mathematics

Of the 64 papers published, only 15 considered directly the relation between Architecture and Mathematics. They were:

"Gaudí and the Alhambra of Granada: a geometrical perspective" by CLAUDI ALSINA & RAFAEL PÉREZ GÓMEZ (not presented in person).

"Use of factor analysis in architectural design" by Ayfer Aytug. In this paper, experimental studies carried out in the turkish Yildiz Technical University are presented.

"A research on the proportional relations in facades of traditional turkish houses; a case-study in Suleymaniye/Istanbul" by CIGDEM BAYTIN. Another paper from the same university.

"Architectural extents" by ANNA CAMPBELL BLISS. This paper reflects the influence of the computer in architecture in both its positive and negative aspects.

"Learning about space and time in Architecture through low-level computer programming" by MARK BURRY & SIMON ANSON. The authors defend the thesis (that I defend too!) that without a little applied mathematics, architecture students will not be able to progress very far within the domain of computer programming.

"Fractals: a new way to understand design and Architecture" by MARÍA ANTONIA CASTRO. In this paper, fractal geometry is presented as a connection between order and chaos, nature and artifice, matter and signs, abstraction and figuration.

"Artificial intelligence in building design" by O. CIFTCIOGLU, S. DURMISEVIC, E. DURMISEVIC & S. SARIYILDIZ. The authors present an interesting AI method for building design, which is based on fuzzy logic and neural network, ending with an application to a case study.

"Two tools for the design of cover-roofs: polynomial curves and Coons surfaces" by ANGEL DELGADO & LUISA MÁRQUEZ. A method to design cover-roofs by using some algorithms that generate polynomial curves and Coons surfaces is presented.

"Information architecture" by PETER FERSCHIN. The purpose of this original work is to give an introduction into the tasks of information design and to establish a ground for multidisciplinary discussion of how principles from Classical Architecture may be suited to an Information Architect.

"On the complexity of form in Architecture" by VLADIMIR KULIC. This paper deals with some theoretical concepts concerning the complexity of form in architecture.

"R.M.Schindler's system of proportions and the Wolfe house" by ANA MARÍA LEON. Schindler, a Vienesse architect trained under Otto Wager, Adolf Loos and Frank Lloyd Wright, devised a system creating a relation between the increasing complexity of the program and the appearance of more sophisticated proportional systems, including geometric approximations of the golden section.

"Beyond paper architecture: the use of CAAD as an artistic medium" by MICHAEL MAHAN. This paper is a case study of a project entitled "Generations of a House", created using a 3D modeling program, as it evolved from purely conceptual representations, to sculpture, to as-built CAAD drawings and finally to video.

"Internet based descriptive geometry course for Architecture students" by PAULO PAVEL & MARIE-CLAIRE RIBEIRO.

"The relationship between Mathematics and architectural Design in Ottoman Architecture" by ZAGFER SAGDIC. Another paper from the Turkish Yildiz Technical University.

"A study of Persian dome interior designs" by REZA SARHANGI. A beautiful analysis of how in Persian architecture, geometry provided diverse stylistic develpments for constructions and designs. The designs reveal, through self-similarity, that the artists had a sense of fractal geometry!

ISAMA 2000 will be hosted by the University of Washington, Seattle, Washington, USA, 21-25 August 2000.