

## Events

# XIV International Conference on Graphic Expression applied to Building APEGA 2019. *From the line to the point cloud*

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The XIV International Congress of Graphic Expression applied to Building, promoted by the scientific association APEGA (Association of Teachers of Graphic Expression applied to Building) was held this year in Seville on 21, 22 and 23 February.

The Congress—organized in synergy by the Department of Graphic Expression and Building Engineering as well as the Department of Graphic Engineering of the University of Seville—had a strong scientific-technological slant and was aimed to collect the main experiences, projects and ideas in the field of graphic expression and related new technologies. It was an opportunity to exchange and share reflections and experiments, aimed at telling the state of the art of Drawing in the fields of architecture and engineering and to lay the foundations for exploring possible research scenarios even beyond the limits of the questioned issues. With forty-eight communications and eight sessions, this year's Conference recorded a significant interest, which was matched by a considerable number of presences.

The underlying theme of the congress was expressed the main statement '*From the line to the point cloud*' whose ambivalence allowed on the one hand to set the extremes of an interval able to accommodate a wide category of

contributions, on the other to highlight the development path of contemporary graphic expression with its scientific and technical implications (fig. 1).

On the specific reflection subject defined, the organizers had the task of bringing together a wide variety of topics and themes that well reflect the wealth of the work undertaken by scholars, at an international level, in the disciplines of architectural and engineering Drawing. In particular, the contributions were collected in three thematic areas, each of which assigned to a coordinator and including five key topics supervised by as many experts.

Area 1, dedicated to the *Line* and coordinated by Emilio Ramirez Juidias, has collected all the contributions specifically oriented to architectural design, cartography and topography, remote sensing and GIS, innovation in teaching and technical design; area 2, dedicated to the *Volume* and coordinated by Santiago Lloréns Corraliza, has instead collected contribution focusing on heritage survey, interior and industrial design, graphic analysis of buildings, design in historic buildings and BIM technology. The third and last area, called *Point Cloud* and supervised by Andrés Martín Pastor, has instead collected the articles related to virtual and augmented reality, ICT applications, parametric and gener-

ative design and digital laboratories, as well as visual communication issues and smart cities up to multimedia production and artistic animation including interfaces and devices related to them. Among the eighty-two contributions, selected by a panel of expert reviewers of different nationalities, twenty-nine were received in Area 1, forty-four in Area 2 and nine in Area 3.

The Congress began on February 21 in the precious setting of the Paraninfo of the University of Seville, the historic Assembly Hall in the Palace of the Rectorate (fig. 2). After the official welcome greetings, the inaugural speech was the keynote by professor José María Gentil Baldrich, of the Department of Graphic and Architectural Expression of the Seville, School of Architecture. Focused on the *Architecture and Building Research*, the contribution skilfully outlines a general framework of research in the architectural-engineering field, tracing its origins and recent history through some of the most significant doctoral theses in Spain, in which the aspects related to graphic expression represented a fundamental element.

In the afternoon, the first two work sessions started with the keynote contribution by professor Vito Cardone, from the University of Salerno, exposed by Barbara Messina (University of Salerno).

*Gaspard Monge and the birth of graphic technical representation*—this is the title of the paper—was a significant contribution to Monge and his work, written by one of his most careful contemporary scholars. In Vito Cardone's contribution, through a wealth of rigorous and unpublished documentary references, clearly emerges Monge's role in the definition of the modern system of representation and the actuality of the thought of a master, who can rightly be considered the father of contemporary engineer.

The panel of the two sessions then saw a series of short speeches focused mainly on the areas dedicated to the *Line* and *Volume* in which professors and researchers shared their experiences. Among the contributions presented, three were representative of the themes addressed: the graphic re-readings of the 5<sup>th</sup> book of Vitruvius's architecture, by Carlos Alberto Cacciavillani and Caterina Palestini (University of Chieti-Pescara), which through the use of digital modelling have retraced in a new way the different graphic interpretations of an aniconic literary work, the digital reconstruction of some unrealized projects by Carlo Mollino, pre-

sented by Roberta Spallone (Politecnico of Turin), and the studies on the implementation of BIM technologies in the didactic field in Engineering schools, exposed by David Valverde Cantero, Jesús Alfaro González and Pedro Enrique Pérez González of the Polytechnic school of Cuenca.

Beyond the interventions mentioned, the two sessions of the day were a good reflection of the wealth of topics present in the first two areas, from 3D models to graphic-analytical rereadings of the heritage, from three-dimensional reconstructions to the potential of GIS and BIM applications in analysis and information processes.

On the morning of Friday 22 February, the work moved to the Campus Reina Mercedes of the University of Seville, in the Degrees Hall of the Higher Technical School of Building Engineering.

The introductory keynote speech was entrusted to professor João Pedro Xavier, director of the Faculty of Architecture of the University of Porto: *The more Geometry The better* is an apology of geometry and its importance in studies, still a current tool for thought and communication. In the contribution of Xavier, the conclusive statement

"long live the Geometry!" appears meaningful. With the acute paraphrase of the monarchic formula *le roi est mort, lives the roi!* he wants to declare, precisely, the continuity of a discipline that, although it may appear today dying and overshadowed by new technologies, maintains its essential function in graphical and design studies.

After the above keynote address then the first two sessions of the morning began. In the discussions, the thematic area relating to *Volume* played a central role. The contributions, still articulated in short presentations, have transversally varied between the different topics moving between new survey technologies, BIM, and geometric analysis of the architectural built at different levels. An example was the paper presented by Alberto Cortés Mendoza, Blas Herrera Gómez and Albert Samper Sosa (Universitat Rovira i Virgili) which highlighted the possibilities offered by the combination of traditional geometric analysis and numerical-computational processes linked to the acquisition of 3D point clouds, to establish whether existing architectural surfaces, for which design plots are lacking, may be hyperbolic hyperboloids. But in the context



Fig. 1. Flyer of the event.

of the discussed topics, also the speech of Antonio Miguel Trallero Sanz of the University of Alcalá, dedicated to the architectural complex called Poblado de Villaflores and its conservation issues, was a significant contribution.

The afternoon sessions instead had the introductory lecture by professor Jaime Rodríguez Pereña from the Department of Agroforestry Engineering of the University of Santiago de Compostela. The subject of his keynote address was the *3D Modeling: the Metric of the Point and its Image*. In a rigorous way he discussed the problems related to the precision of the spatial representation of the built environment and to the integration of the relevant digital methods—functional to the graphic description of complex shapes. Afterwards, the presentations of the various research works through which the speakers compared, with different addresses, the most current issues related to BIM and to the graphic-generative analysis of architectures and decorations. In this regard, two contributions have been illustrative of the themes addressed: the methodological considerations proposed by Pablo Nestares Pleguezuelo and Raquel Nieto Álvarez of the University of Granada, to solve the drawing of the patterns of Islamic square matrix decorations; and the experiments of Lia Maria Papa, Pierpaolo D'Agostino and Carlo Giannattasio of the University "Federico II" of Naples, on the use of BIM within the existing built heritage, applying integrated techniques of CAD to BIM and SCAN to BIM to the case study of a historic building, designed by the architect Luigi Moretti between 1970 and 1973 and later used as a university residence.

On Saturday, February 23<sup>rd</sup>, the congresses gathered again in the Degrees Hall of the ETSIE. The two final work



Fig. 2. Seville, Antigua Real fabrica de tabacos, University Rectorate.

sessions, which took place in the morning and were punctuated by a meeting of the coordinators of the thematic areas, were characterized by a broader comparison also on the thematic area relating to the *Point Cloud*. In fact, the contributions exposed touched on topics related to ICT applications, virtual and augmented reality, parametric and generative design and artistic animation.

Among the various short speeches of the first session, Andrés Martín Pastor of the Seville University and Francisco González Quintal of the University of the Basque Country presented a significant experience on the use of developable surfaces for the creation of ephemeral architectures, showing a project titled *The Cactus Pavilion*. It is a temporary and itinerant biomimetic architecture in wood, consisting of developable convolutes generated through a parametric algorithm specifically de-

signed and implemented through CAD CAM and CNC technologies. The work is carried out as part of the *Project to Rescue the Architectural and Natural Heritage of Santiago de Anaya in the Mezquital Valley in Mexico*.

The suggestions offered by Alfonso Berroya Elosua and Maitane Echevarria Aguirre on the incursions of architectural and environmental representation in the field of gaming and video art have instead appeared captivating.

In the second session we report the contribution of Pablo Rodríguez Navarro and Teresa Gil-Piqueras, of the Polytechnic University of Valencia which illustrates three works of archaeological importance in the bed of the Thames in London promoted by the MOLA (Museum of London Archeology). The three surveys (in the areas called The Old Swan Stairs and Wharf, Isleworth Eyot and Gallion's Reach) highlight a methodology rich in innovative solu-

tions that called into play, integrating them, structure-from-motion photogrammetry (Sfm), and laser surveying scanner, to adapt the work to the complex problems posed by the objects of the survey.

In the late morning the conclusion of the conference is marked by the usual assembly of the members of the APEGA scientific society followed by the closing lunch.

As part of the conference, awards and prizes were awarded for the works presented at the 2019 Edigráfica exhibition, aimed at promoting the dissemination of works and publications by scholars and professors, carried out in the two-year period 2016-2018. In particular, the first prize 'Juan Manuel Raya' was award-

ed to the *Cactus [re]-Action* project by Andrés Martín Pastor of the University of Seville, while two mentions were attributed respectively to the work *Innovación Docente en Expresión Gráfica Arquitectónica*, by the authors Concepción López Gonzalez, Teresa Gil Piqueras, Pablo Rodríguez Navarro, Jorge Garda Valdecabres and Rafael Martín Sánchez (Polytechnic University of Valencia), and at work, entitled *Diseño de un prototipo de alojamiento con material reciclado*, by the authors Cristina Jiménez Espina and Santiago Llorens Corraliza (University of Seville).

It leaves positive feelings, on the whole, the scientific debate fielded in the three intense days of work. A confrontation of certain interest, which has opened to

reflections on the increasingly complex relations between drawing and technological progress, exploring issues often on the margins of the most consolidated study areas.

The attractive themes of the scientific program of the conference were then joined by the cultural ones derived by visits to the host city.

From this point of view, Seville was undoubtedly a welcoming and culturally vibrant city for the conference, offering participants the opportunity not only to learn about the architecture of the historic university building—the theatre of the conference works—but also to visit, with the precious support of professors and researchers, urban spaces and the most significant monuments.

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