

## METHOD FOR QUICKLY DEVELOPING AN ARCHITECTURAL PROJECT BY MEANS OF DIAGRAMS

### DESCRIPTION OF THE TECHNOLOGY

One of the key parts of the development method of an architectural project consists of distributing the uses in the space. It is a repetitive process as it requires multiple trial and error tests that involve a great investment of time. Accelerating the process is in many cases a need and a technical problem to be solved.

Thanks to the appearance of computers and specialized software development for architectural design, the method has been significantly simplified due to the incorporation of genetic algorithms that result in the geometries of the Voronoi polygons (see Figure 1).

With all this, the group of trial, simulation and modeling of structures (GRESMES) has developed a **software that allows to generate architectural projects quickly and 100% personal and customized**. It is a very simple procedure:

During a two-hour conversation between the architect and the client/s, the application shows, **in real time**, how the geometry of the project is born, grows, is modified and evolves until its completion. For this, the architect will need to obtain a series of information from the client.

Three phases can be distinguished:

- 1) Application Form. This will be filled with the location of the plot, number of floors, number of rooms, surfaces, budget and other more personal matters such as hobbies, special dates, favorite movies, etc. From all this information a numerical string is obtained.
- 2) House Design. The numeric string will be incorporated into the application and will start to show the geometry of the perimeter and the interior division of the spaces in the house. At the same time, the client may modify some aspects such as the position of the rooms, their surface, the type of joining of the corners, etc. All this by means of a filter system and 3D display.
- 3) Room viewer. It is also possible to modify the number of windows and their size, the location of the furniture or the materials.

The end result will be a totally customized unique design.

### MARKET APPLICATION SECTORS

This new procedure may be perfectly applied within the Construction and Architecture sector (development and construction companies), as well as in industrialized construction process companies (modular housing) as the house can be built in a production facility and then move it to the appropriate parcel.

### TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

- It allows to develop singular variants of the same architectural typology at high speed, to be evaluated by the architect and its later modification with great agility.
- It allows the participation and direct involvement of the client in the decisions by being able to see the result instantaneously, practically in real time.
- It will be a totally unique project for the client because it will be the result of a diagram consisting of a combination of numbers provided by the client. Therefore, a very strong emotional link will be generated between the design developed and the client.
- This procedure can be applied both in houses on a flat surface and those on a slope, of a single height or buildings of up to 5 floors, new constructions or house refurbishments as well as any type of conventional construction material can be used. All this without increasing the final price of the house.
- This automatic method greatly accelerates the development of the architectural project, reducing time by approximately 30%.

### CURRENT STATE OF DEVELOPMENT

There is a prototype of a house made entirely of wood and made with this technology that was exhibited at FIRAMACO 2016, the main fair of Reform and Rehabilitation of the province of Alicante, is called "Architecture of Identity" (see Image 2).

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Furthermore, with the help of this innovative procedure, the construction of a single-family house in Polop de la Marina (Alicante) has already been completed with very positive results (see Image 3).

### INTELLECTUAL PROPERTY RIGHTS

This technology is protected by patent.

- Title of the patent: "Procedimiento automático de obtención de un diagrama base de perímetro general de planta y perímetros de espacios caracterizados por su uso de un edificio".
- Application number: P201600779
- Date of application: 22/09/2016

### COLABORATION SOUGHT

The research group is looking for companies interested in acquiring this technology for commercial exploitation through patent licensing or technical cooperation agreements in order to adopt the technology to the company's needs.

### RELATED IMAGES

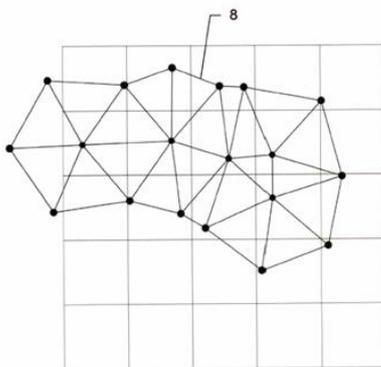


Figure 1: Voronoi polygons



Figure 2: Prototype "Arquitectura de Identidad"



Figure 3: House "ADI 90.91.2.8.59.11.40."

### CONTACT

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