

# Chromatic and decorative planning choices: geometry, knowledge and survey

<sup>1</sup>Giulia Pellegrini  
pellegrini@arch.unige.it

<sup>1</sup>Department of Architecture and  
Design, University of the Study  
of Genoa, Polytechnic School

## ABSTRACT

This study wants to highlight the complex planning and technological/procedural choices in order to address all types of painted façades' intervention: conservation, maintenance and restoration.

The major difficulties in surveying the historical façades' painted decoration, depend mainly on the conservation conditions of the same, on the building support, on the degree of legibility of compositional scheme, on the cultural sensitivity of the researcher and on the objective knowledge of the different types of plastics and painted ornaments of historical architecture.

The methodology includes: study of historical treatises on the art of drawing of the architectural orders, study of historical treatises on geometry (study of shadows), study of the theories of color and the repercussions on the current methodology survey painted decorations with the direct method and computer graphics.

So the complex research is to ensure through finding colors and decorative types of individual cases and of their building as a whole understanding the rules and the methods ' use of decorative repertoires, of colors of materials and of the execution techniques of compatibility historical / figurative design.

The planning choices regard principally the two components:

- compositional structure and decorative façade
- color values of all the elements of the façade.

## KEYWORDS

Survey, Colour, Decorations, Geometry, Planning, Digital

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**Giulia Pellegrini** is associate Professor in Drawing scientific disciplinary sector, Department of Architecture and Design -Polytechnic School of Genoa-Italy, and member of the Architecture and Design Graduate School. Research interests: Urban and Environmental Survey, Drawing Representation of analogic and digital techniques, Geomatics aimed to the Conservation and Restoration and Colour Measurement Systems.

## 1. INTRODUCTION

This study wants to highlight the complex planning and technological/procedural choices in order to address all types of painted façades' intervention: conservation, maintenance and restoration.

The major difficulties in surveying the historical façades' painted decoration, depend mainly on the conservation conditions of the same, on the building support, on the degree of legibility of compositional scheme, on the cultural sensitivity of the researcher and on the objective knowledge of the different types of plastics and painted ornaments of historical architecture.

The painted decorations often follow exactly the compositional schemes of orders in architecture but, depending on the historical, economic and cultural period different types of decoration can be distinguished such as: architectural elements, ranging from the simple to the most complex structural and spatial moldings partitions; architectural elements intermingled with individual figures located in front of the prospective apparatus or in other cases inserted into them, in order to assume themselves the role of structures; figurative subjects inside large panes, historical or mythological scenes, allegorical figures or personification of the political and military power with their symbolic meanings.[1]

The knowledge of the treatises, of the study of historical texts on the "ornaments" and of the notions of teaching about the possible compositions of the architectural decorations and their proportions with the study of shades, are fundamental for the purposes of painted decoration survey and conservation.

On this basis this study analyzes the relationship between the color and the drawing in the context of external finishes of the historical façades, how much the drawing defines the color or vice versa how much color composes the drawing through the balance among color fields and combinations of hot and cold.

It's fundamental to highlight how the drawing and the color are related to the potential conditionings that may accentuate, mitigate, reduce or differentiate the individual elements, making a proportionate or perceptually distorted building, through the research about the drawing of the patterns and the visual perception of painted decoration. This research analyzes the drawing of the shadows through the study of the shape, of the depth and of the thickness, the painting technique of chiaroscuro and the proper use of color. Is drawing color and/or is the color shape and so drawing? This question is often at the base of the problem of the study and of the revival of the façades' painted decoration and it concerns many issues that arise as the

fundamental approach to the problem. This paper proposes a methodology for the research aimed to investigate the relationship among drawing, color, plastic and painted façades' decoration.

The methodology includes: study of historical treatises on the art of drawing of the architectural orders, study of historical treatises on geometry (study of shadows), study of the theories of color and the repercussions on the current methodology survey painted decorations with the direct method and computer graphics.

## 2. DRAWING FATHER OF THE ARTS: ARCHITECTURE, PAINTING, SCULPTURE

*Che cosa sia disegno, e come si fanno e si conoscono le buone pitture et a che; e dell'invenzione delle storie.*

*Perché il disegno, padre delle tre arti nostre architettura, scultura e pittura, procedendo dall'intelletto cava di molte cose un giudizio universale simile a una forma ovvero idea di tutte le cose della natura, la quale è singolarissima nelle sue misure, di qui è che non solo nei corpi umani e degl'animali, ma nelle piante ancora e nelle fabbriche e sculture e pitture, cognosce la proporzione che ha il tutto con le parti e che hanno le parti fra loro e col tutto insieme*

(G. Vasari, *Le vite de' più eccellenti pittori, scultori e architettori*, vol.I Della Pittura, cap. XV, 1550, Edizione Giuntina)

Vasari sees the technique of the art all enclosed in drawing where we can find the values of ideation, introducing a first classification of the drawing techniques according to the degree of complexity. In his treaty, Vasari clearly distinguishes sketches, intended as hint touches, from draws, intended as a defined section with profiles and contours essential for the architecture, sculpture and painting. [2] But even in *The Book of Art*, 1390, Cennino Cennini places the painting second only to the science: "The foundations of the art are drawing and colour", highlighting a good amount of techniques and supports of the art. In the fifteenth century treaties pay more attention to the "linear drawing", which allows a greater detachment from reality and therefore a greater focus on pure composition. The Renaissance treatises emphasize the importance of drawing, seen as the main skill required for anyone who aspires to become an architect. Sebastiano Serlio - *Tutte l'opere d'architettura, et prospectivae*, 1538- was one of the most popular books during the sixteenth century; the beginning of Book II observed that

*"the perspective would be nothing without the architecture and the architect would be nothing without the perspective." (Figure.1)*

Serlio pointed out how all the greatest architects of his time, Bramante, Raffaello, Peruzzi and Giulio Romano, had started out as painters.

In the new division of labor that took shape during the fifteenth and sixteenth centuries, what constituted a new genus of architects, regardless of the construction industry, was their mastery of drawing. This made it possible to separate their activities from construction and design, due to the link between the drawing and the geometry made possible by the new science of perspective. This period bound architecture to abstract thinking, guaranteeing the status of intellectual labor rather than manual. Within the new division of labor, the drawing was the only part of the process of building production on which the architects maintained an absolute and exclusive control.

Leon Battista Alberti reinforces this idea by asserting that "it is possible to draw all forms in the mind without any recourse to the material." On the one hand the drawing was entrusted with the vital responsibility to convey the idea from the mind of the architect to the created building, but on the other hand the drawing suffered from the disadvantage of being always considered inferior to the idea and, finally, to degrade it. In practice, this tension was resolved generally overestimating the accuracy of the orthogonal projection and exaggerating the falsity of perspective. Alberti was the first to do this:

*"The difference between the drawings of the painter and of the architect is as follows: the first seeks to emphasize the importance of the objects in the painting through the light*

*and shade by thinning the lines and angles; the architect rejects the light and shade, but he gets its projections by the plan and, without altering the lines and keeping the actual angles, reveals the extent and shape of each prospect and of every side." [2]*

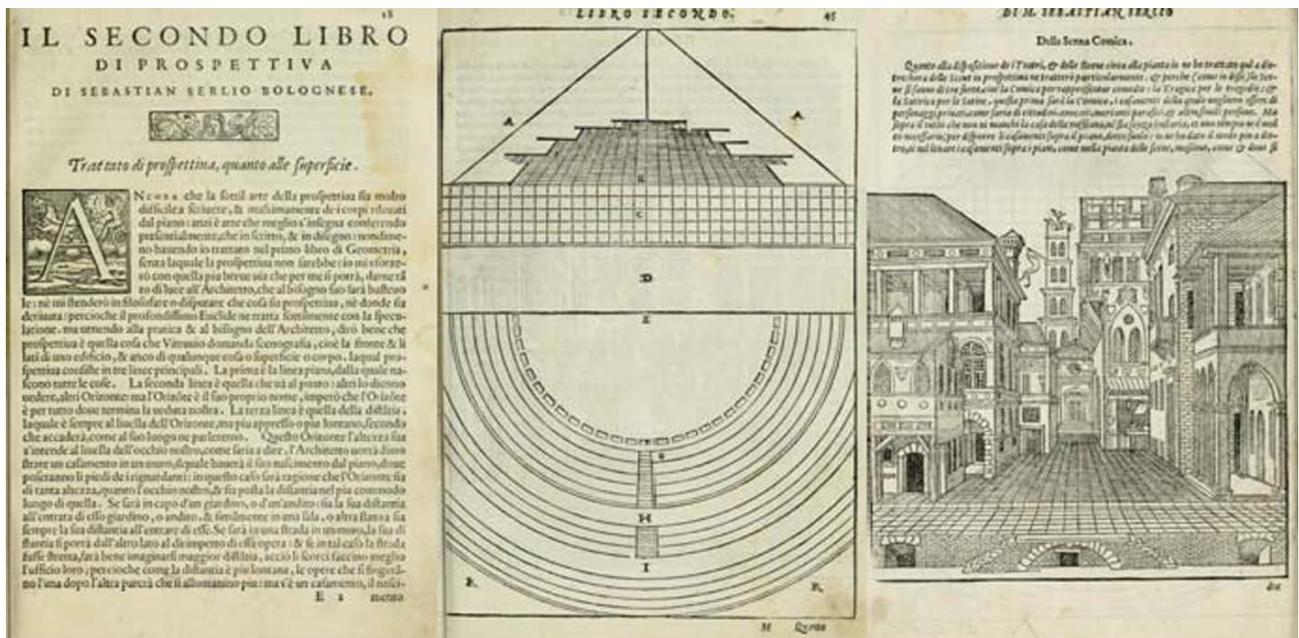
A very interesting graphical approach is the book "Perspectiva pictorum architectorum" by Andrea Pozzo, Romae, 1693 with the attached tables of the prospective study from different points of view and the study of light and dark, particularly important for the technique of trompe l'oeil.

A. Pozzo doesn't limit himself to writing a theoretical treatise, but he has the merit of teaching the way to put into perspective all the architectural drawings, to use both for painters and for architects,

*"the deception of the eye, can be achieved only through a knowledge and a thorough study of the perspective technique. This is the ambition of my book "(so A. Pozzo writes in the dedication to the future Habsburg Emperor Joseph I).*

The first part is about the basic canons of matter, the second part is about the operational procedures for drawing in perspective domes, altars, fountains, stairs and other architectural elements. The treaty is placed in the established tradition of architectural treatises such as Palladio, Serlio, Vignola and Scamozzi. The artist, however, differs from these illustrious names, elaborating a treaty that explores the art of perspective in all its variations and applications: architecture, painting, theater, ephemeral apparatus. The Jesuit artist can without doubt be considered the supreme representative of the quadraturism representation.

Figure 1 - S.Serlio, Tutte l'opere d'architettura, et prospetivae, Venice, Ed. 1600



The quadrature's painters, making use of knowledge about the geometric perspective and the techniques of pictorial representation on large wall surfaces, reproduce spectacular spatial effects through the drawing of architectural elements real or imaginary.

In the fifteenth century the interest of painters, sculptors and architects focuses on the problems of linear perspective and in this context there are the first symptoms of the distinction between painting figures and architecture.

The passage of the decorative painting, from ornamental architecture to connection with the depicted scenes and, later, to the development and completion of the building structure itself, is marked by the application of the principles of linear perspective to architectural frameworks and architectonic backgrounds.

In the late seventeenth-century Rome, Pozzo represents the top of Baroque visual culture that stems from a bold artistic experimentation exalting, with unpublished proceedings, the allusive power inherent in the image space. (Figure 2) [3] With the drawings of the treatises of the eighteenth and nineteenth centuries, the study and the use of shadow confirm, unlike Alberti, one of the foundational aspects of the drawing representation. The "draw" achieves the highest academic reputation in the nineteenth century, thanks to the lessons imparted by the academies in Europe, where the watercolor technique was widely considered to be essential to give a more incisive and popular character to the performance, because, unlike the linear perspective, which presupposes an intellectual process in the understanding of the design, and the watercolor, and the use of shadows are an expression of easily understandable language forms.

Figure 2 - Pozzo Andrea, *Perspectiva pictorum architectorum*, Romae, 1693

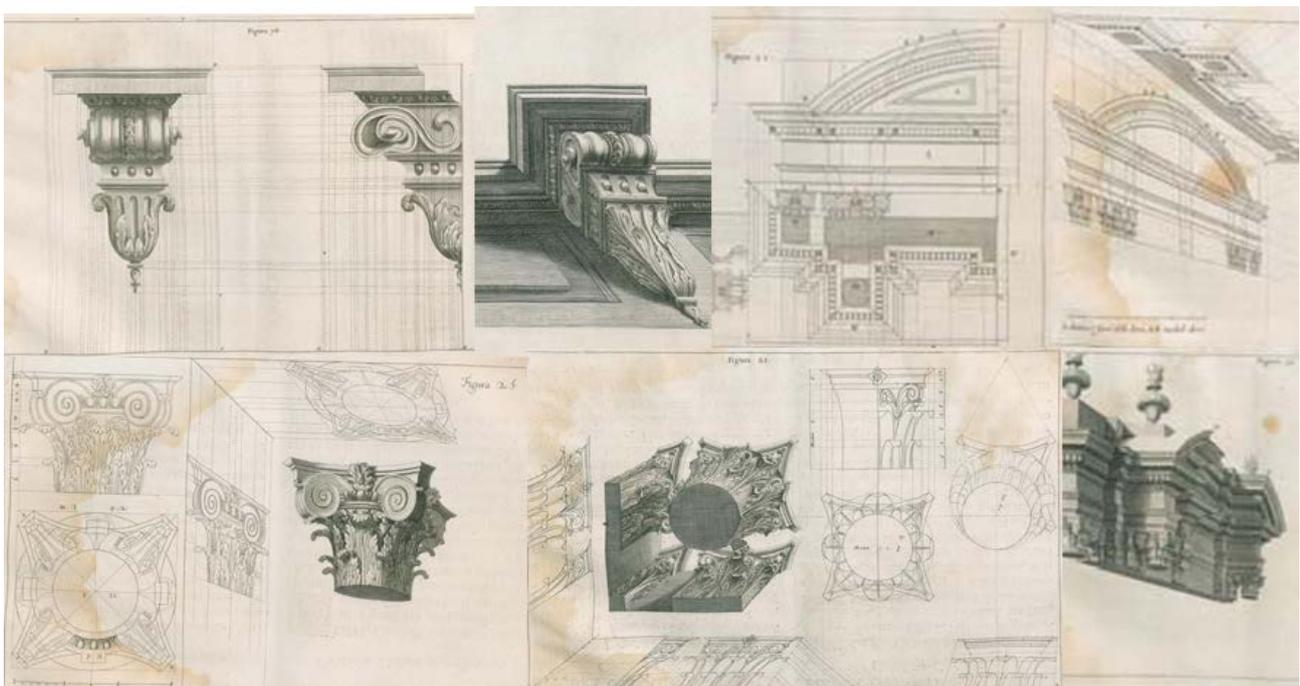
### 3. CONCLUSION: SURVEY - DRAWING - APPLICATION

For the methodological approach, the survey plays a vital role in reaching the historical/critical and formal knowledge both quantity and quality aspects of the historical fronts' finishes, ranging from those historical, figurative and perceptual to the technical ones reaching the valence of incontrovertible documentation of the state of art, and tool of guidance and control, in order to avoid arbitrary choices.

The critical survey, beyond the measurements and related graphic representations through plans, sections and elevations, becomes fundamental to address the typological study of the urban fabric i.e the processes that characterize an urban organism in the succession of its evolutionary phases.

It's necessary to read the architecture as the result of a multiplicity of interventions in the realization of urban spaces highlighting the actual development through the basic building, the remelting and the superfluous.

A fundamental study for the achievement of quality is the decorative historic structure, even in the simplest cases, always arises in interrelation with the overall architectural structure to prevent figurative distortion and ungrammatical remakes. So the architectural survey of the fronts with the overall decorative structure, must be articulated at different scales. The critical survey together with the graphic description a method of search about the fronts' characters is the main cognitive tool of quality survey and secondly the dimensional proportionate scheme in order to distinguish and describe the decorations, the types and the materials, from the sketch to the development



of the relationship between architecture and decorations (architectural order –color) . So the complex research is to ensure through finding colors and decorative types of individual cases and of their building as a whole understanding the rules and the methods ‘ use of decorative repertoires, of colors of materials and of the execution techniques of compatibility historical /figurative design . The planning choices regard principally the two components:

- 1 - compositional structure and decorative facade
- 2 - color values of all the elements of the façade.

The analyses have a sense and a consequence design with the study of the decorative color -treatment of the facade from the simplest monochrome to the most complex types with painted polychrome decorations extended to all part of the façade through direct and instrumental tools (measurement, photography, infographic Photo rectifier with shields and processing of contrast..).

The study of the painted decoration, as mentioned above, can't be tackled without the depth and knowledge of the treaties, architectural orders, the study of descriptive geometry and the rules and applications of the drawing first and of the color then.

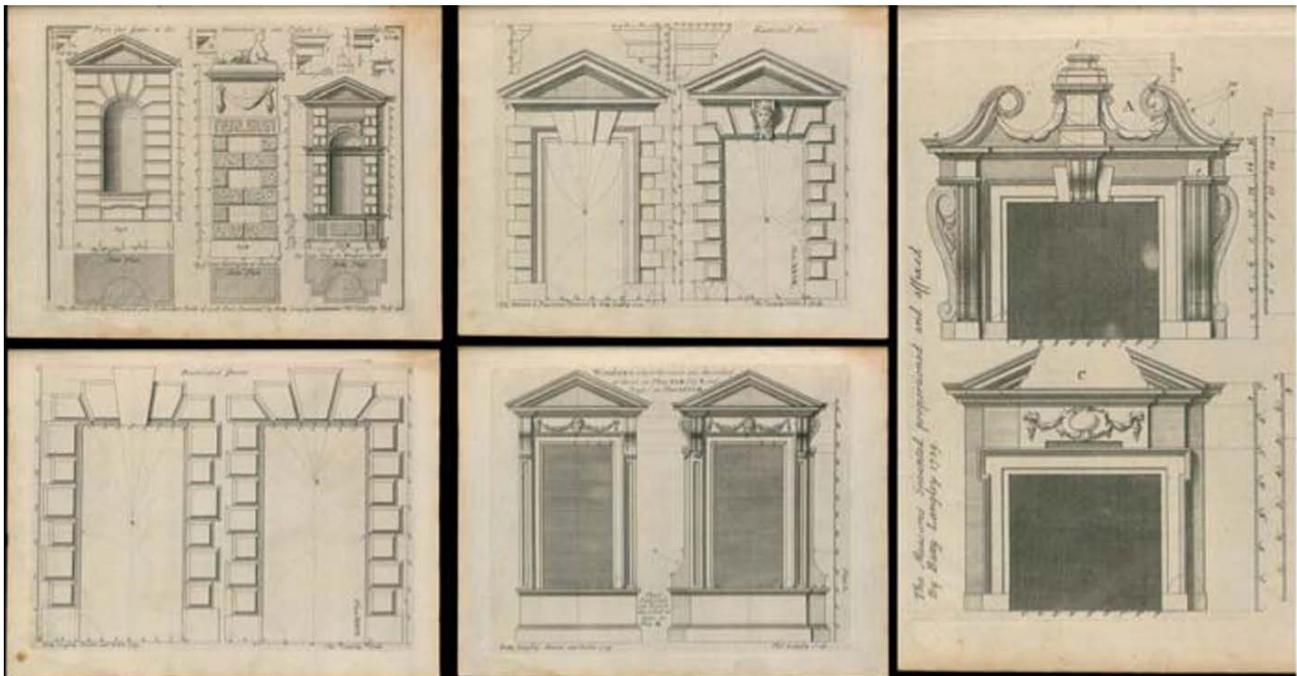
Particularly interesting for the purposes of restauration and/or the project of facades' painted decoration, are: *Rules for Drawing the several Parts of Architecture* Gibbs, James London, 1736; *The City and Country Builder 's and Workman 's Treasury of Designs or The Art of Drawing and Working the Ornamental Parts of Architecture*

Langley, Thomas London (Figure 3), 1740 and *The principles of architecture* Nicholson, Peter London, 1795-1798 (Figure 4), that are actual implementation of practical manuals about architectural decoration and composition of the façade.

At first they follow the practical and organic characteristics; then process in an aesthetic sense without losing distinctive character, until in a final stage of stylistic development break down sharply from the element structure; to give a rhythm in architectural compositions, emphasizing the wealth of some areas and aesthetically changing relationships. The first type of decorative expression is inherent in the materials, the design is obtained by processing of surfaces - flat, rustic ashlar, and imaginative forms of the Renaissance. The aesthetic transfiguration of the architectural elements is due to two methods: geometric procedure and reproduction of the essential aspects of the nature both from the point of view of the design of that of color. The application of stucco depicting the elements of nature and the architectural orders in the Renaissance has extensive use of decoration on the façade, while in the seventeenth and eighteenth centuries are used in order to free decoration from any constraint other than that of the general architectural framing.

The first of these applications simulate the architectural elements of stone (frames, ashlars, shelves) or mimic, in the more strictly ornamental expressions, garlands, shells, drapes, or foliage. Then they gradually assume fantastic character, which only remotely reminiscent of ancient models, in broken curves frames, twists, plaques, flourishes of any kind. The color was almost constantly used, sometimes

Figure 3 - The City and Country Builder 's and Workman 's Treasury of Designs: Or, The Art of Drawing and Working the Ornamental Parts of Architecture Langley, Thomas London, 1740



as indispensable attribute of the form, or with overlay colors to construction elements, or with the coating of paint entire wall surface, or with the combination of different polychrome materials.[4]

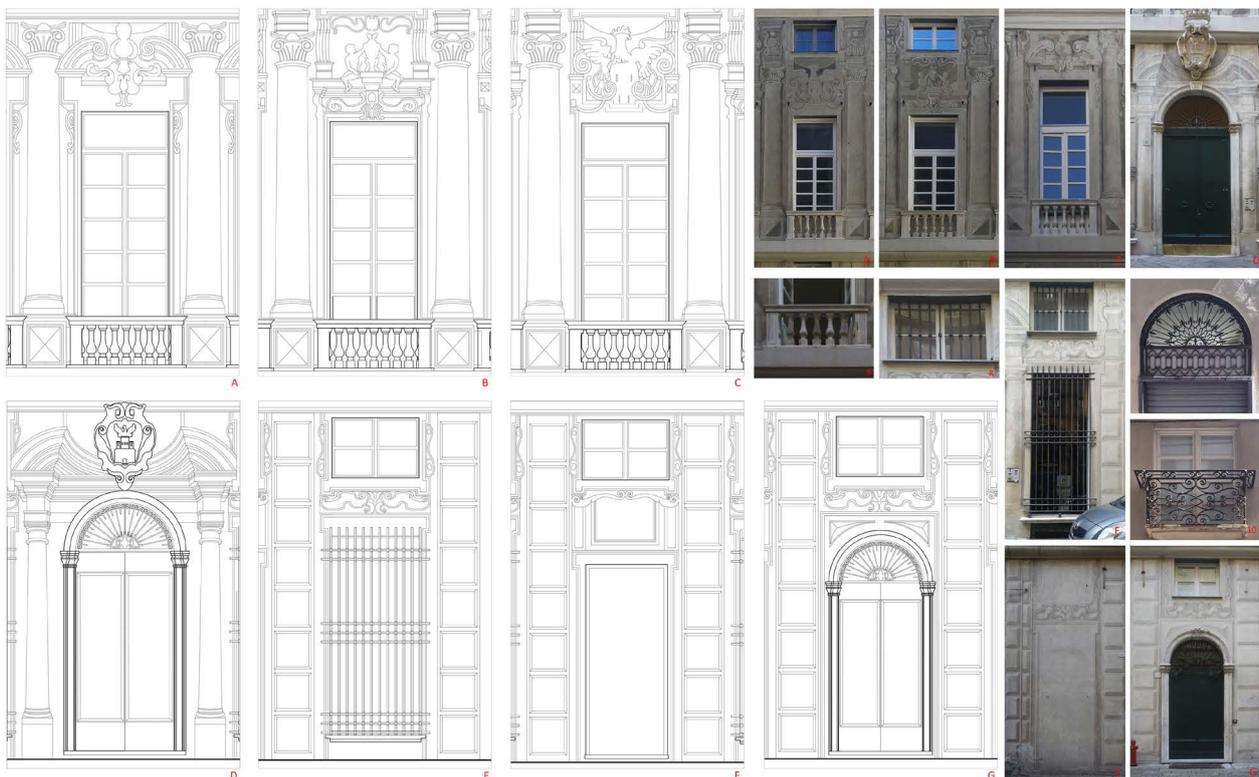
The first step is to define the decorative signs of the façade in proportional relationship to the study of the component parts, identifying, at the same time, the base color and then the ornaments' color. For this reason, the composition of the façade, simple or complex, takes into account the primary structures of the building i.e. the vertical and horizontal ties. (Figure 5)

The approach exemplifying the types of decorative facades led to the identification of

three basic types: Monochrome Bottom front and basement with simple decorative elements (frames) - Monochrome Bottom front with monochrome base or ashlar with decorative elements or simple (and frames antheridia) and Monochrome bottom front with base monochrome ashlar or complex with decorative elements (frames- antheridia-pilasters-panels and other decorative elements). The use of bringing back in front the structural nature of the building and especially the highlighting of the main floor has caused in the visual-perceptual-formal habit, that has conditioned the decorative design choices to the point of incorporating two floors in a decorative order so to donate luxuriousness that internally does not exist.

Figure 4 - (1-2-3-4) The principles of architecture Nicholson , Peter London, 1795-1798, (5)- Panel of Study at the Academy of Fine Arts in Genoa. On the right study on compositional decorative pattern for the Color Project in Savona (Italy) through Infographic Photo rectifier with shields and processing of contrast.

Figure 5 - Survey and drawing representation of the painted decoration of facades. Historical Centre of Genoa.



The decoration is also meant to recreate a harmony of "lost" proportion, adapting the decorative elements to spaces.

The wide panorama of case studies, which emerged at the meeting in Rome "Coatings, Colour, Colouring of Buildings and Historic" in 1984, sponsored by the Ministry of Environmental, exceeds the two extreme positions of restauration all short , or restore an outright original color, which often no longer has any acknowledgment nor with the current reality, nor with more recent historical memory. [5]

Where overexposed theories do not find possibilities of application, to attain an appropriate harmonic relationship of the colors to be used, we should refer to the theory of colors applied to wall surfaces that receive the color. In this case, by referring to the color table, the design directions want to highlight a line of intervention in the choice of the chromatic colors of the facade in order to avoid that between the painting of two neighboring buildings there is a chromatic saturation deviation exceeding 15% and of more than 10% color brightness. [6] (Figure 6)

In the treatise Grammar of Ornament, O. Jownes describes the use of colors connected to the plaster and painted architectonic decoration (proposition n. 14-15-16-17-18). [7]

A right approach to the choice of colors in the painted decoration of the façades is in the awareness that it is influenced by the ratio

of the proportion between the parties given by perception especially by the contrast of simultaneity [8]: definition of the decorative composition and identification of the different color fields, through the study of individual components and of the relationship between the color of light and shade.

The planner, once identified the decorative "types" arises the problem of verifying the wanted prospective study perceptual in relation to the environment and to the visual quality of the façade. The restoration of the painted decoration is the result of an accurate survey of the historical traces in order to reproduce, as closely as possible, the spirit of the original work.

The direct survey, the drawing from life, the investigation, also photographic, from the panoramic to the details are the early steps of analysis aimed to color plan of painted facades. The compositive architectural façade was created as an expression of the lexical composition of the aggregation highlighting the architectural building elements and their interconnections. From drawing to wire, the yield of shapes, surfaces, contours through tones and graphic textures, up to a constant enrichment of personal stock of signs and techniques, everything becomes essential to understand an architectural detail, the relationship between architecture and urban configuration or landscape. Drawing from life is depiction, critic visualization, communication, but this

Figure 6 - Synthetic scheme of urban and environmental survey in the ambit of the research agreement: The ancient center of Albenga, analysis, surveys and profiling aimed at recovering and restoring the color value. 2012-2013 Scientific responsible G.Pellegrini



obvious assertion is precisely the most difficult to achieve, because, after a long time, you have the powers of observation and execution and the readiness of reading the real meanings that allow you to translate the observed reality in an image rich in meaning and can convey to those who view the drawing, the relationship established between reality and draftsman.

Just as a subjective model of reality always different and changing, still-life drawing is the result of a complex set of shape analysis, for immediate application of geometric concepts, of tonal evaluation, of the characters' selection, knowledge of graphic techniques and, of course, of critical consciousness. In practice drawing from life allows us to

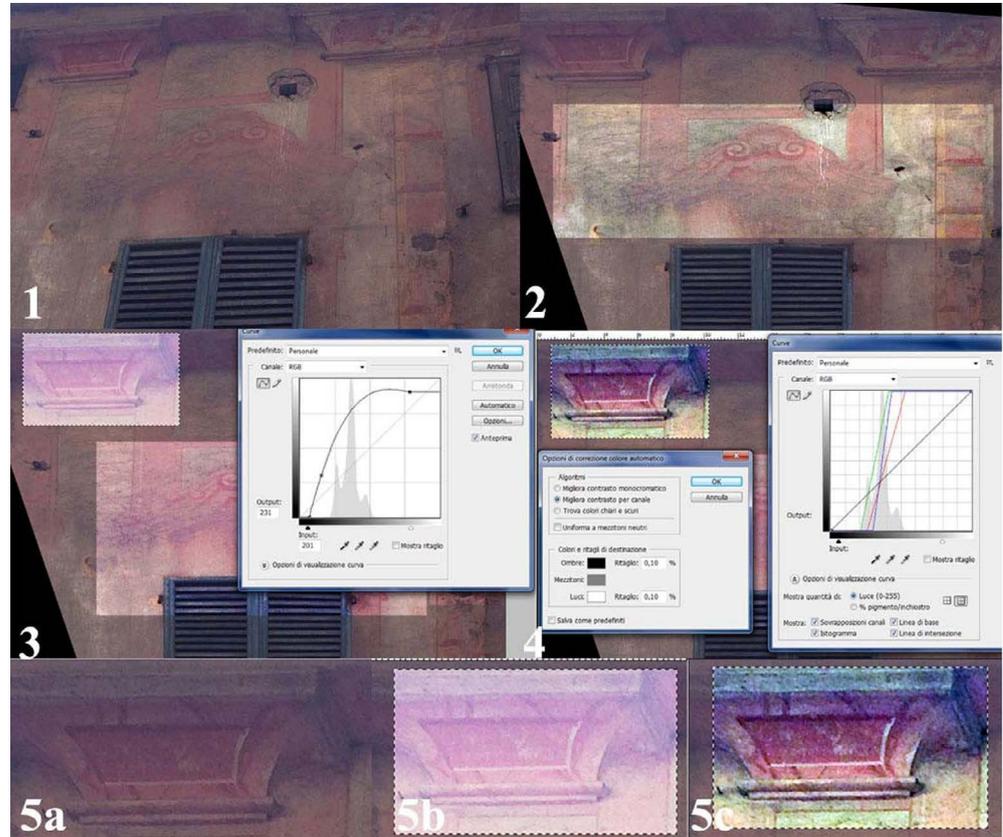


Figure 7 - 1 – Photograph of detail of a painted façade in Genoa Cornigliano; 2. Infographic Photo rectifier with shields and processing of contrast; 3. Development by chromatic variation curves of contrast; 4. Color correction automatically by algorithms, clipping colour channels to increase the contrast and correct colour casts; 5 a-b-c-. Last Steps with the addition of algorithmic processing aimed to find the bright and the dark to use as light and shadow

SEZIONE PROGETTUALE		SCHEDA N.
Proposta delle cromie: sistema CIE Lab		1/F
Punto di riferimento cromie N ○		

ZOCCOLO	A	L	49.04	-0.87	5.42
BASAMENTO	B	L	50.38	17.62	22.24
FONDO	C	L	71.21	14.28	17.76
	D	L	84.04	2.71	10.30
	E	L	38.80	2.40	2.72
	F	L	38.59	29.27	23.28
DECORI	G	L	84.04	2.71	10.30
	H	L	38.80	2.40	2.72
	N	L	55.92	-1.15	0.12
CORNICIONE	I	L	84.04	2.71	10.30
INFISSI ESTERNI	L	L	32.23	-12.88	3.16
PORTONE	M	L	32.23	-12.88	3.16
FERRI	N	L	55.92	-1.15	0.12

Figure 8 - Exercise of Painting Façades Decorations at the Academy of Fine Arts in Genoa and the typological scheme of the color project section for the painted decorations of the ancient center of Albenga

observe how things change depending on the brightness, the distance from the point of view and proximity to other elements; it allows us to understand that the technique must not prevail on observation and transcription of meanings. This research highlights how the images acquired during the photographic survey are altered by computer graphics systems first with photo-rectifier and then with shields contrast, with the study of tone and of colorimetric curves in order to identify the different color tones. (Figure 7)

At Academy of Fine Arts in Genoa, the students approach to the decoration of façades through the application of the drawing and the color theories painting panels starting with sketches on paper and proceeding with the fresco technique. From drawing to wire it goes to dust and then to the pave of the color tests with the same procedure with which we apply the chiaroscuro on painted façade, starting with the drafting of the basic colors. In the first phase are applied the 1st dark, the 1st light and the first shadow on the bottom so as to make three-dimensional drawing.

Then you apply the 2nd dark (for a darker tone) and the 3rd dark (still a darker tone), the relights (a lighter tone) and the second drop shadow. The final touch is given by a dark reddish-brown that is used to give more depth (Figure 8).

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## CONFLICT OF INTEREST

Potential conflicts don't exist.

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