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PAINTING AN ELEVATION BY LIGHT

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Abstract

Night illuminations of historical architectural objects have been discussed. In order to simulate light effects on the existing object of the Royal Palace in Łobzów, renderings with a defined illumination were made. The author proves that illumination is not only a matter of engineering, but also an art. The possibility to influence the reception of architecture through illumination and the possibilities to simulate illuminations using computer software are investigated. It tries to answer the question whether the method of work, which requires utilization of precise data, deprives the designer of artistry.

Keywords: illumination, light, historical architecture, rendering

Streszczenie

Niniejszy artykuł porusza tematykę nocnej iluminacji architektury zabytkowej. W celu zasymulowania światła na istniejącym obiekcie Pałacu Królewskiego w Łobzowie wykonano wizualizacje komputerowe z przypisanym oświetleniem. Autor wykazuje, że poza przyjętą i praktykowaną często jedynie stroną inżynierską iluminacja to też dziedzina sztuki. Praca ma na celu zbadanie możliwości wpływania poprzez oświetlenie na odbiór architektury oraz możliwości symulowania oświetlenia za pomocą programów komputerowych. Próbuje też odpowiedzieć na pytanie, czy metoda pracy polegająca na wprowadzaniu ścisłych danych pozbawia w tej kwestii projektanta artyzmu.

Słowa kluczowe: iluminacja, światło, zabytkowa architektura, rendering

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1. Aims of illumination, aims of the work

The work is initiated by a thesis classifying illumination as an artwork. This assumption is supported in the further portion of the paper by showing how illumination influences the spectator and how it is created. The Polish dictionary defines art as "…artistic creativity, which manifests itself through works of literature, music, painting, architecture, sculpture etc. that meet the requirements of beauty, harmony, aesthetics and stimulate reflection" [1, p. 997]. During the interpretation of illumination, its feature common with architecture was considered, where "The art is the ability to shape and organize space in real forms in order to fulfill material and spiritual needs of the man; it is also a reflection of social and economical needs of the man's environment, as well as of forms of organized life" [2, p. 12]. The same assumptions, as in, architecture, find application in illumination with a difference that illumination is based on an existing object, where it emphasizes or creates a picture being received by a spectator. Wojciech Żagan specifies the following goals for an illumination "…an increased attractiveness of the object, delivery of a different view, emphasized details, creation of a romantic and mysterious atmosphere around the building, stimulation of the spectator's imagination, improvement of the appearance of cities, districts and streets in the evening and the night, drawing attention to select objects, extends the opening hours of an object by attracting tourists and customers, improved security of the object and its surroundings, an advertisement of the company which has its headquarters in the illuminated building" [3, p. 26]. The work discusses the subject of planning of the overnight illuminations, nevertheless, it is worth mentioning that a majority of existing objects is illuminated, even if only randomly by street lamps or illuminations of other objects [3]. Even though illumination focuses on the building being a subject of an illumination project, its interaction with the surroundings is very important. It is a strictly physical aspect on one end, the dissipation of light in the direct vicinity of its source, and on the other an aesthetical aspect, creation of an image of a larger area – a city or a district and objects in this area. Alojzy Śpik discusses the importance of the context of a building being illuminated: "The matters of illumination of historical and other buildings cannot be treated as a problem separated from street illumination, advertising and neon lights. These relevant types of illumination intersect and supplement themselves, or may in case of incorrect design solutions interfere with each other" [4, p. 27]. In the textbook *The Illumination of Objects* by Wojciech Żagan, a wholesome approach to the illumination of cities is described, with a particular emphasis put on the selection of the object for illumination and the decision process behind deciding whether a given object shall be actually additionally illuminated "The selection of objects intended for illumination is a complex problem which has to be solved through development of a wholesome vision of illumination of a given city or its part, and within this framework a decision shall be made with regards the illumination of a given building" [3, p. 17].The utmost goal of illumination is according to Alojzy Śpik: "Through a properly designed illumination we can create an unforgettable aesthetic impression, we can escape for a short time into the world of beauty, poetry and reflection, detach from the harmful pace of nowadays life, revive long gone times" [4, p. 1].

2. Realizations

The discussion of illuminations would be out of touch with the reality if we were not to consider the conclusions coming from observations of existing realizations. Dominik Mączyński reveals the possible outcomes of the application of light effects [5]. He points out the perfectly designed and executed illumination of the cathedral in Reims: "Contrary to the Romanesque style, Gothic introduced in France an almost unusual invigoration of the so far massive walls, and through its soaring and light forms it created completely new relations between the space and shapes. The walls of Gothic cathedrals make an impression of being unusually light and transparent. This characteristic image of the Gothic architecture was successfully presented in the night view…" [5, p. 245]. As an example of an incorrectly designed illumination, Mączyński points out a tenement house on the Main Square in Krakow, where the sharp illumination neither reproduces the original architectural setting nor emphasizes the details, but in turn, it adds non-existing elements to the reception [5]. As positive examples, the Italian realizations of illuminations of historical buildings are referenced. In the case of the Coliseum in Rome, illumination from the inside, with cold flooding light was applied, resulting in a low illumination of the object. Thanks to the low number of used lights, the curve of the building was retained. The deep arched openings were illuminated with a warm light, which produces an impression of an ongoing spectacle taking place inside. The upper ring was illuminated with an intensive light. A similar approach was used in the case of the illumination of The Papal Basilica of St. Peter in Vatican. The baroque facade was delicately illuminated in its entirety, while a warm light was introduced into the niches with statues. The dome has intensely illuminated colonnades and delicately outlined curvature. These examples indicate that proper solutions are the ones which, through illumination, do not lose their own shape and the natural character of the illuminated object is retained during the night reception [5].

3. Tools

Illumination trials were carried out using a computer. Sketchup Pro7software with the photorealistic renderings add-on V-ray 1.48.89 was used. Having a 3D model available, the following become important: the positioning of the sources of the light, the calculation method, the materials of elements interacting with the light and cameras, as the software during its work reproduces the physics of the light. Each of these stages has an influence on the final effect – i.e. the generated image. Steering is achieved through the introduction or change of parameters in the settings window. The colour of the object has to be set as the actual colour seen in the white light. Before the lights can be "tried on", one has to first create a physical camera which will enable a complete control of the exposition and frame and will also provide a reference between the generated images and photographs. The most time consuming stage, and also the one having the biggest influence on the final effect of the project, is the positioning of the lights. Aside to a global illumination, the following are available: floodlights for which one can choose such parameters as power, angle of the light beam, dissipation angle, colour of the light, softness of the shadow and parameters according to which the light is being calculated by the software. V-ray has also illuminators which can be uploaded from files in the IES format, spherical and flat lights as well as materials

capable of emitting light. The majority of manufacturers of lamps and fixtures make IES files available which, after uploading into the software, provide a faithful simulation of the specific sources of light. One sets up the positioning and parameters, and next, trial renderings are made. In V-ray 2.0, one can observe the changes in real time, thanks to the function Real time rendering. Once the desired effect has been achieved, postproduction in the frame buffer window takes place. The program renders the elements of the picture into channels, the multiplier of which can be changed after the rendering is made. At each stage, the designer can decide on the colour, shape and what is presented. The original assumptions often get out of hand giving thus unexpected results. An important assumption in the designer's work is the selection of the view of the object that is most common to the spectators.

4. Trials

Illumination trails were executed for a facade – typically, the most observed portion of any given building. The work was initiated by a study of the current state of the building and whether there is a need for illumination. The building is lightly illuminated by street lamps situated at the ramp, it also has one spherical lamp over the main entrance and is surrounded by thick greenery, which causes that overall the object is not well exposed despite its considerable size. This indicates a need for an exposition of the building, for instance, with the use of light. At first, trials with flooding light illuminating the facade were made; however, architectural details and characteristic portions of the object were not shown in any way in this case. For this reason, trials with spot lights were undertaken, with the use of which all details were marked, the rhythm was underscored as well as important portions of the facade. This solution gave, however, an image differing from the original look of the object in the daylight – too strong was the articulation of the borderlines, and too the intensive contrasts were producing on the object non-existing forms – as a consequence, the overnight reception of the object was not natural. To obtain a complete simulation of the illumination effect, over the images of the illumination, photographs of the trees blocking the view of the facade were superimposed. The verdure blocking portions of the facade indicated the weak points of the spot illumination. Covering of certain strong elements [2] caused a loss of the rhythm and legibility of the composition. The image of the object illuminated globally was dominated by trees – this is a consequence of high contrast. This is not encountered on facades illuminated in this way. Considering the failure of the first two attempts, another trial was undertaken in order to mitigate the negative effects. The facade was illuminated globally with a relatively low illumination and details and side portals were brought into the picture by illuminating them with floodlights.

The number of operations required during each correction of the illumination is worth mentioning. While the execution of the corrections can be facilitated through the application of components in the Sketchup software, a change of the entire conception calls for a complete reorganization of the elements emitting the light. This indicates that an illumination shall be designed immediately in detail. This approach is however difficult to master and is, at the same time, contradicting the rule of going from a general view to the detail. A solution to this problem is treating a portion of the object's image which contains features present throughout the entire object as a general view. On this portion, the illumination concept is verified with a small number of lights, and hence, adjusting the sources, their positioning

and parameters can be done easily. This approach was verified on a close-up of the facade encompassing the left wing with a side portal and decorative barriers of the terrace. Trials for a flooding illumination with adornments, emphasized with the use of a shadow, were carried out. Also, a variant with combined illumination was prepared where the floor of the balcony was illuminated, which through a differentiated illumination highlighted the multilayer nature. The next stage comprises a play with colour, which, if inconsiderate, can however lead to nowhere, a weak in effect showiness. The trail with colours suggested a thought that, if one can influence in the negative way, then it would be worth trying to create or recreate something valuable. The present form of the palace was created mostly during its 19th century reconstruction. An attempt to recreate the atmosphere of those days was undertaken on an image simulating the illumination of gas lamps with regards to their colour, intensity, and dissipation angles. The building remains, in this case, in a warm twilight, and in the background of the thick greenery, it might appear as a sanctuary of quietness. It is also worth illuminating the greenery from underneath, which removes its strong contrasts and includes it in the overall setting.

The aforementioned examples, even though do not attempt to list in an exhaustive way all the possibilities, indicate the multitude of solutions and the potential freedom during creation of images, determination of the overall setting and consideration of detail, as well as utilization of imagery. These features are characteristic to drawing and painting. The universality of the aesthetical solutions and the similarity of the reception by the man irrespectively of the region and the domain shall also be pointed out. Ray Evans presents methods for imagination of architectural objects which base not on photorealistic reproductions of the reality, but on outlining the most important facts for the spectator [6]. In this way, a symbolic image is created that is full of impressions, where only details are underscored, and a general outline of the form is drawn using broad knowledge on the object itself: "Can anyone Draw buildings without knowing something about their construction and history? I doubt it, any more than the human figure can be drawn without a knowledge of anatomy" [6, p. 7].

5. Conclusions

Creating a night image of an architectural object shall undoubtedly be a domain of art, with the same purposes as the ones of the drawing and painting. In this case, it is an art intended for the general public with basic assumptions based on a conscious manipulation of the impression, knowledge of the object, its history and meaning, as well as the needs of the man. This approach yields not only the attraction of the spectator's attention and a clear imaging of the architecture, but also the most important: i.e. creation or reconstruction of the atmosphere of the location. A computer serves merely as a tool, it rather aids the designer in calculations and determination of technical details and enables thus a realization which, in the end, gives an effect as close as possible to the conceived one.

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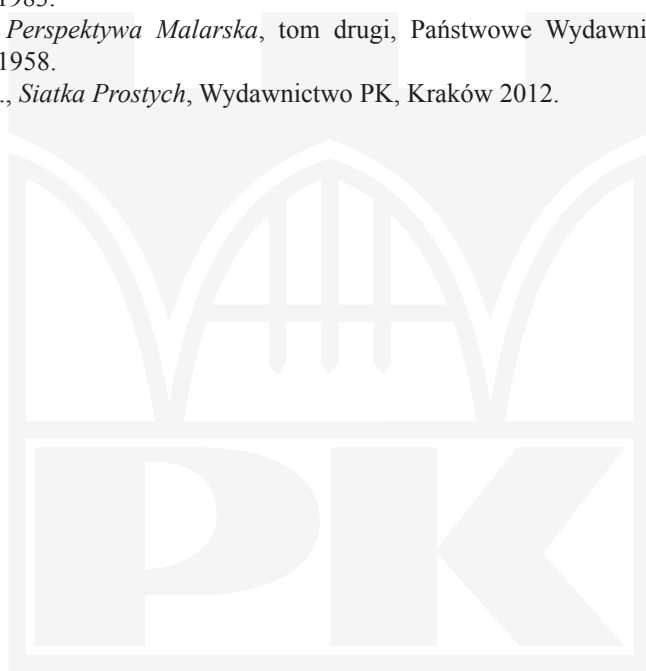
Ill. 1. Daylight visualization of the facade of Palace in Łobzów. Left hand side presents views taking into consideration the existing verdure (author's own design)

Ill. 2.Visualization of the facade illuminated with flooding light

Ill. 3. Visualization of the facade illuminated with spot lights

Ill. 4. Visualizations of the facade illuminated through a combined method

Ill. 5. Combined illumination solution on the left wing of the building

Ill. 6. A proposal for a gas lamp illumination presented on a portion of the facade