

The architectural pattern of St. Petersburg and jewellery: Innovative designs via 3-d modelling

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Abstract

Having served as the capital of Tsarist Russia for two hundred years until the Bolshevik Revolution in 1917, the second biggest city of Russia and her gate to Europe, St Petersburg is the city full of historical buildings of fantastic architecture with its historical texture. Because of its historical and cultural significance, St. Petersburg is in UNESCO's List of World Heritage Sites.

On one side, there we have St. Petersburg, a fascinating city, the subject of Dostoyevsky's novels, with cathedrals, churches, palaces, bridges, statues, and museums, housing rich cultural and historical heritage; on the other side, there we see jewels, reflecting the soul of women and embellishing their bodies.

With this study, inspired by the authenticity and the city's architectural pattern, innovative designs have been created via advanced 3D modeling technology. Thus, it was aimed that the beauty of the grandeur of history could be utilized as accessories, gaining a new functionality and transferring the cultural heritage values from local to universal level.

Practical Research Methods have been adopted as a research methodology. The sampling of the study has been limited to the embellishments reflecting the architectural texture of St. Petersburg, as an inspirational resource

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for jewelry modelling. In planning the study, the stages of analysis, synthesis, selection and modelling of jewelry designs have been taken into account.

Keywords: St. Petersburg, Architectural Pattern, Jewelry, Jewelry Design, 3D Digital Modelling, Innovation.

1. Introduction

1.1. History of St Petersburg and Architectural Texture

Saint Petersburg is pronounced as Sankt Petersburg in Russia. The city, with its harbor, is situated in the north-west of Russia. It is a major historical and cultural center as well. It is at the 70 of North Pole and on the north west of Moscow, and 640 kilometers away. It is the second largest city of Russia, being one of the most important cities in the world, too. It has always played an important role in Russia's history since its foundation in 1703. It served as the capital city for two hundred years, from 1712 to 1918. In terms of architecture, the city has the finest and most exquisite sites in Europe. It was listed by UNESCO as a World Heritage Site in 1990. Many people want to visit the city owing to its historical, cultural and architectural heritage. It has three distinct features: First, it has architectural harmony blended by West European and Russian schools. Second, though the other cities are defined with their medieval backgrounds like Kremlin and surrounding cities, St Petersburg is not defined in that way. Third, it has many water channels flowing into the Neva. The city is called "Venice of the North". It has a special long period of time between June 11 and July 2, lasting 19 hours, called "White Nights", taking world's attention (Encyclopedia Britannica, <http://global.britannica.com/EBchecked/topic/518092/St-Petersburg>).

Russia, after the accession of Peter, the Great, to the throne in 1689, experienced an era of military, political and architectural aspects and was modernized and westernized. St. Petersburg, as a consequence of the first westernization attempts, emerged as the door to Europe in 1703. In that period, St Petersburg became the capital city of Russia and the architectural design of the city was carried out by the architects from Europe. Following the Peter's reign, during the reign of Catherine, the Great, (1762 – 1796), the city was filled with Antique Roman architectural examples (Fletcher, 1975, Translated by, Denктаş, 2011).

With this study, innovative 3D modelling jewelry designs were made, inspired by the architectural texture and authenticity of the city. Thus, starting with the idea, "touching is more significant than seeing", the spectacular architectural buildings were miniaturized and the feelings of touching and accessibility were realized in human sizes. Different designs were made for that end. Information about various cathedrals and churches, the topic of this study, is given below:

1.1.1. Voskresenia Khristova Church

This church, Voskresenia Khristova (Figure 1), was designed by Alfred Parland in 1883. It was constructed to commemorate the martyrdom of Alexander II by Alexander III in the square where he was martyred. In the center is an octagonal tower upon which a pyramidal roof was placed. On top of the roof is situated a tiny onion dome and a lighthouse. The façade of the building was divided into three sections and the middle parts are larger than the other sides. On the sides are onion domes. The three hemispheres on the northern front have geodesic-domes. On these domes are placed gilded onion domes. On the western façade, in the upper part, a belfry is situated. In this octagonal structure, the tower based on sixteen pedestals is covered with an onion dome (Denктаş, 2011).

1.1.2. Chesme Church

The church (Figure 2) was built by Yury Felten in neo-gothic style between 1777 and 1780 to honour the 1770 Russian victory over Turks at the Battle of Chesme. It has a "quatrefoil" layout in the form of four semi cylinders with barrel vaults. Painted pink and white, the church appears like a "candy cone, with long, vertical white stripes (embossed vertical string cornices drawn together with figured horizontal fascias). In 1923, the church was closed down and used as a storehouse. Between 1941 and 1945, the church suffered damages during the "Great Patriotic War". During the Second World War, the Institute of Aviation Technology took possession of the Church and the Chesme Palace. During 1970–75, it was fully restored under the supervision of the architects M.I. Tolstov and A.P. Kulikov. Religious control was restored to the Russian Orthodox Church in 1991, and regular church services have been held at the church since then (<http://www.encspb.ru/object/2804010449?lc=en> : Accessed on: 22.05.2015)

1.1.3. Naval Cathedral

Naval Cathedral (Figure 3) is a major example of the so-called Elizabethan or Rastrellieqsque Baroque. It has the shape of a cross and is decorated by Corinthian columns, stucco architraves, a wide entablement and is crowned by five gilded domes.

The marine regimental church was built on the bank of the Kryukov Canal in 1753–1762 to a design by Savva Chevakinsky, the main architect of the Russian Navy, in place of an earlier wooden church. A freestanding four story bell tower with a tall gilded spire was erected in 1755–1758. The main church is dedicated to Saint Nicholas (a patron saint of seamen) and the feast of the Epiphany. St. Nicholas Naval Cathedral consists of two separate churches. The lower Saint Nicholas Church is located on the first floor, while the upper Epiphany Church is on the second floor. The altar of the upper church was consecrated in the presence of Catherine the Great. The main shrine of the cathedral—a Greek icon of St. Nicholas made in the 17th century with a portion of his relics—is located in the lower church. In 1908 the Tsushima obelisk was erected in the garden in front of the church in memory of those killed at Battle of Tsushima. In 2000 another chapel was consecrated in the lower tier of the bell tower (<http://www.saint-petersburg.com/cathedrals/St-Nicholas-Cathedral.asp>)

1.1.4. Kazan Cathedral

The church (Figure 4) was constructed by the architect, Andrey Voronikhin between 1801 and 1811 with its huge garden with a fountain surrounded by impressive stone walls, modelled after the St. Peter's Basilica in Rome via the Orthodox Church. After Napoleon invaded Russia in 1812, and the commander-in-chief Mikhail Kutuzov asked Our Lady of Kazan for help, the church's purpose was to be altered. The Patriotic War over, the cathedral was perceived primarily as a memorial to the Russian victory against Napoleon. Kutuzov himself was interred in the cathedral in 1813 (<http://www.saint-petersburg.com/virtual-tour/kazan-cathedral/>).

1.1.5. Peter and Paul Cathedral

Peter and Paul Cathedral (Figure 5) is the first landmark in St. Petersburg, serving as the main cathedral, built between 1712 and 1733. The baroque cathedral and the fortress were designed by Domenico Trezzini. It merges the typical church styles of western Europa and Italy. It is rectangular in shape and the cathedral's bell tower is the world's tallest Orthodox bell tower, 402 feet. The interior decorations did not match the typical traditional Russian religious architecture. The cathedral was merged under a single roof with equally high aisles and naves. The main space was divided into three sections with columns looking like marbles. It was decorated with frescos and gilded embellishments. Though supported with 12 large windows, it is relatively dark inside. It was the first church decorated

with paintings and symbols. It houses 43 authentic symbols of 18th century Russia (http://www.spbmuseum.ru/exhibits_and_exhibitions/92/1316/).

1.1.6. Trinity Cathedral

Trinity Cathedral (Figure 6) is one of the largest monumental temples in Saint Petersburg. With its glaring blue dome, the cathedral can be seen 20 kilometers far away from the city. It is a late example of the Empire style, built between 1828 and 1835 to a design by Vasily Stasov in order to honor the Izmailovsky regiment of Imperial guards formed by empress, Elizabeth which takes its name from a royal residence in Izmailovo. This regimental cathedral owes its fame to the Izmailovsky regiment who fought in 1812 Great Patriotic war and Russo-Turkish war in 1877 and 1878. The soldiers of this regiment attended the summons in the cathedral and presented the church with the badges and medallions they were awarded (<http://www.spbmuzei.ru/troickiy2.html>). Trinity Cathedral has four white Corinth cloisters and domes and can house up to 3000 people. (<http://www.patriarchia.ru/db/text/101824.html>).

Churchs and Cathedrals



Figure 1: Voskresenia Khristova Church
(The State Monument Museum,
<http://eng.isaac.spb.ru/>: Accessed on: 26.05.2015)



Figure 2: Chesme Church ([http://www.st-petersburg-essentialguide.com/churches-in-st-petersburg.html#gallery\[pageGallery\]/14/](http://www.st-petersburg-essentialguide.com/churches-in-st-petersburg.html#gallery[pageGallery]/14/) : Accessed on: 01.06.2015)



Figure 3: Naval Cathedral
(<http://www.angelfire.com/pa/ImperialRussian/>



Figure 4: Kazan Cathedral
(<http://www.saint->

blog/index.blog?start=1360267439 ; Accessed on: 02.06.2015)

petersburg.com/virtual-tour/kazan-cathedral/: Accessed on: 22.05.2015)



Figure 5: Peter and Paul Cathedral
http://www.spbmuseum.ru/exhibits_and_exhibitions/92/1316/: Accessed on: 01.06.2015)



Figure 6: Trinity Cathedral
(<http://www.saint-petersburg.com/cathedrals/Trinity-Cathedral.asp> : Accessed on: 07.06.2015)

1.2. A Part of Dresses: Jewelry and Fashion

Dresses are comprised of jewelry, accessories, make-up, hairstyle, shoes, etc. Clothing culture varied in history depending on geographical conditions, gender, life styles, beliefs, and culture. Cultural elements reflected upon clothing styles, determining the hierarchical structure, economic conditions, social status, professions, working fields, and styles of people (Türkoğlu, 2002, p:22; in Artun, 2012). Fashion, having emerged as a consequence of different styles sought by different individuals, is the wish to express oneself. Fashion, despite the traditional habits, hosts diversity in itself (Gürsoy, 2010; in, Benli).

Clothing is the element which leads to judgements at first sight. The combination of the dress, shoes, accessories and jewelry is of significance. The nice look of the dress expresses the taste and inner feelings of the wearer. This in turn transforms clothing into a taste rather than a necessity (Altınöz, et al, 2000). Accessory, as a term, was borrowed from French in Turkish. It is the added element into the main clothing, accompanying it as well. All that complete clothing can be called accessories, such as jewelry, hats, shoes, gloves, bags, belts, etc. Mankind, since antiquity, have shaped metals and bones to make necklace, rings, earrings, etc (Benli, 2013). Clothes and accessories change in time, being influenced by different currents and social events.

Fashion design is the struggle towards creating new things in life styles, thoughts and appreciation. From this point of view, it is the element that molds life and society (Tunalı, 2009, in Benli, 2013). The most important feature of fashion design is the necessity to reflect appearance and aesthetics. Fashion design requires thought and philosophical systems. Some of these can be counted as; observing and evaluating the nature, environment and events and approaching the social events from a right perspective (Gürsoy, 2010).

1.3. Design

Design can be described as the change in colour, line, texture of a whole product or of a part, and the elements perceived by human senses. The designs can be classified as the ones by hand on paper

or on any material or those made via computers. As technology progresses, the designs in people's minds also develop. Technology has become of the most important tools in presenting the creative designs for the service of mankind (İncearık, 2015). Designs and their details in terms of being tactile poses physical and psychological accessibility to the wearers by their clear visibility. The purpose and content of a design does not matter (Şener, 2005). Design covers both art and engineering. Political, economic, scientific developments all affect designs. Designs aim at moulding all the objects in our lives and dreaming new things (Kauffman, 1954; in Türkel, 2008).

Designs are based on creating new products in innovative and attractive ways out of real objects. The basic elements of clothing and accessories are drawings, lines and surfaces. The use of these basic elements make up the basics of design, such as repetitions, diffusion, rhythm, classification, contrast, harmony, balance, and portion (Jones, 2013). The psychological dimension of a design has become a matter of debate recently by designers too. For that end, the designs to be made to feel that the owner of the designs would prefer to live with them were started to be produced. The notion, human-oriented design, has led the designers to design things which are not functional but also ready to meet the psychological demands, as well (Fiell & Fiell, 2003; in Türkel, 2008).

1.4. 3D Modelling and Jewelry Designs

In the period dating back from the pre-historic times till today, the materials and technological advances have not been very rapid. However, today's technology is a lot more precise and faster in production stage (Cindoruk, 2005). Computer-assisted design (CAD) is the action via which it was made feasible to increase the quality and speed of design preparations, making simulations looking like almost real (Information Management Handbook, 2006). CAD must be interpreted as a support to designers in creating their designs. 2D and 3D design capacity is a technical issue. It is the electronically expressed version of being a talented draughtsman. Since design is a mental project or schemata, this mental image has become a medium for reflecting the inner world of the designer to the outer world (Erzenin, 2002).

3D means three dimensional. These are the three axes, X, Y and Z on the coordinate system. 3D modelling is the vector design format of an object in digital media. The end result is the geometric representation of the object and is called 3D model. The first step is the colourless sample, forming the backbone of the design. The model is drawn in accompany with the real replica and coated with patterns and texture. At the final stage, the simulation of the model is rendered via the process called "render". The objects get their final forms via effects, renders, light and shadow options, etc (<http://www.nuur3d.com/3d-tasarim/3d-tasarim-nedir/>)

2. Method

In the innovative design process, practical research was adopted. Practical research is the hands-on application of the information whether produced or in production stage (Karasar, 2007: p. 27). In this research, practical applications were carried out in the light of existing knowledge. During the goal-oriented design production stage, the historical, natural, artistic, architectural, social and cultural patterns and contemporary architectural textures were preferred as a source. After forming the theme, graphic imaging, drawing, texture and motifs were made and designs were structured.

In the process of 3D modelling and jewellery design, the architectural texture of St. Petersburg, described as the second largest city of Russia and its opening door to Europe was chosen. It is a fascinating city with cathedrals, churches, palaces, bridges, statues, museums, monuments and rich historical and cultural heritage. In this study, these features of St. Petersburg were reflected upon the jewellery designs representing women's spirit and embellishing their body all through the history.

The architectural texture of the city and its authenticity were inspired and with 3D modelling modern designs were created. Thus, it was aimed that the historical grandeur and beauty could be used in accessories, gaining a new functionality, being transformed from local to universal, and a sample study was conducted.

Random samples from the cathedrals of St. Petersburg, the subject of the study, were taken as sampling. Architectural elements and texture were analysed in an integrated manner and sample pictures were collected.

The architectural elements, being the inspiration of the study, were transformed into 3D jewellery designs. The architectural elements were re-interpreted by the designer and put into jewellery designs. The general characteristics of the architectural designs were preserved and some changes were made, keeping the functionality and tactile features in mind.

3. Results

In this part, the products inspired by the architectural designs and elements were given under the heading of research analyzed and collated.

INSPIRATION



Figure 7: Voskresenia Khristova Church

3D JEWELRY DESIGN



Figure 8: Voskresenia Khristova Pendant



Figure 9: Chesme Church



Figure 10: Chesme Church Ring



Figure 11: Naval Cathedral



Figure 12: Naval Cathedral Stone Pendant



Figure 13: Kazan Cathedral



Figure 14: Kazan Cathedral Stone Pendant



Figure 15: Peter and Paul Katedrali

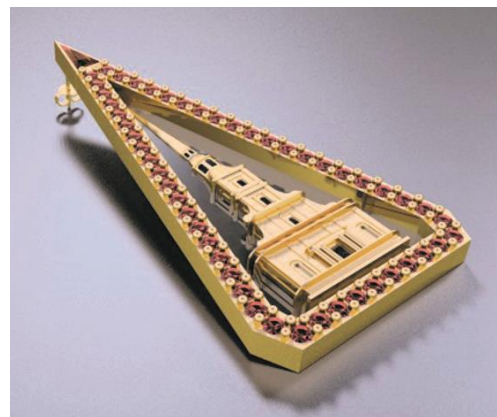


Figure 16: Peter and Paul Cathedral Earring

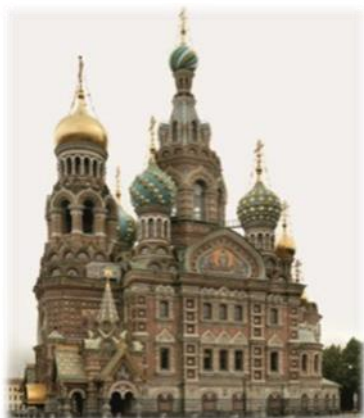


Figure 17: Voskresenia Khristova



Figure 18: Voskresenia Khristova Earrings



Figure 19: Trinity Cathedral



Figure 20: Trinity Cathedral Ring

4. Discussion

Wearing jewellery has been a necessity since the dawn of mankind. In order to meet this “need”, people have made accessories for different parts of their bodies out of seeds, kernels, bones, teeth, and sea shells and then through shaping metals, precious and semi-precious stones, this development has come up till today.

With the changes in human’s needs, increased level of education, development of global social networks and advance of technology, we witness infinity in designs of jewelry and fashion. It is believed that tastes in designs could contribute to cultural share and life to a great extent, reflecting individuality through historical architectural textures in jewellery designs in the way to the infinity of designs.

It is of great significance that one should be aware of the culture, artefacts and artistic works they belong to, utter the language of the art acquired, re-interpret the wealth of designs, and form a visual lingua franca via technology. In this study, starting off with the motto, “touching is more important than seeing”, we aimed at creating the sense of psychological accessibility and tactility via miniaturizing the architectural buildings in human sizes. For that end, 3D jewellery designs were created.

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