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Recovery of a vandalized canvas painting *Our Lady of the Rosary* from Vrlika (Croatia)

Sandra Šustić, Ivan Režić, Mario Cvetković

Abstract: This study is related to the major recovery project of an 18th century oil painting on canvas depicting Our Lady of the Rosary, the patron saint of the parish community of Vrlika and its surroundings. During the Croatian War of Independence in 1992 it was taken off the main altar and vandalized by the paramilitary units. This resulted in termination of a century long tradition of annual feasts in Vrlika in which the painting was publicly displayed and carried by the townsmen. Based on the available visual materials: a high resolution old black and white photograph and the low resolution coloured one, respectfully, using the computer colorization algorithm, and also relying on detailed visual analysis of the original paint layer, a major reconstruction was carried out in 2017. This research has demonstrated that the recovery of the artworks with dramatic losses is an extremely complex social phenomenon difficult to characterize by any general factor or based on any general approach.

Keywords: vandalism of art, war-damaged art, reconstruction, cult image, social value, religious art, painting

Recuperación de un lienzo destrozado de Nuestra Señora del Rosario de Vrlika (Croacia)

Resumen: Este estudio está relacionado con el gran proyecto de recuperación de una pintura al óleo sobre lienzo del siglo XVIII que representa a Nuestra Señora del Rosario, la patrona de la comunidad parroquial de Vrlika y sus alrededores. Durante la Guerra de Independencia de Croacia en 1992 fue retirado del altar principal y destrozado por las unidades paramilitares. Esto dio lugar a la terminación de una tradición centenaria de fiestas anuales en Vrlika en las que la pintura era exhibida públicamente y llevada por los ciudadanos. Tiendo por base los materiales visuales disponibles: una fotografía antigua en blanco y negro de alta resolución y la de color de baja resolución, respetuosamente, utilizando el algoritmo de coloración por ordenador, y confiando también en un análisis visual detallado de la capa de pintura original, se llevó a cabo una reconstrucción importante en 2017. Esta investigación ha demostrado que la recuperación de las obras de arte con pérdidas dramáticas es un fenómeno social extremadamente complejo, difícil de caracterizar por cualquier factor general o en base a cualquier perspectiva general.

Palabras clave: vandalismo de arte, arte dañado por la guerra, reconstrucción, imagen de culto, valor social, arte religioso, pintura

Recuperação de uma tela vandalizada Nossa Senhora do Rosário de Vrlika (Croácia)

Resumo: Este estudo está relacionado com o grande projeto de recuperação de uma pintura a óleo sobre tela do século XVIII que representa a Nossa Senhora do Rosário, padroeira da comunidade paroquial de Vrlika e arredores. Durante a Guerra da Independência da Croácia em 1992, foi removida do altar principal e destruída pelas unidades. Isso resultou no fim de uma tradição centenária de festivais anuais em Vrlika, nos quais a pintura era exibida publicamente e carregada pelos cidadãos. Com base nos materiais visuais disponíveis: uma fotografia antiga a preto e branco de alta resolução e uma a cores de baixa resolução, respeitosamente, utilizando o algoritmo de coloração do computador, e contando também com uma análise visual detalhada da camada pictórica original, uma grande reconstrução foi realizada em 2017. Esta pesquisa mostrou que a recuperação de obras de arte com perdas dramáticas é um fenômeno social extremamente complexo, difícil de caracterizar por qualquer fator geral ou com base em qualquer abordagem geral.

Palavras-chave: vandalismo artístico, arte danificada pela guerra, reconstrução, imagem de culto, valor social, arte religiosa, pintura

Introduction

“Even when the work is mutilated or reduced to fragments something of its original totality always remains.” (Mora et al 1996)

The restoration of cultural heritage with dramatic losses, resulting either from the natural processes or through the deliberate human action, represents a subject nowadays often discussed between conservators and art historians. The approaches in formulating general guidelines involve many different aspects to be considered ranging from technical and sociological, to philosophical and psychological points of view. Although considerable research has been devoted to architectural and archaeological heritage, a rather less attention has been paid to the visual arts recovery (ICOMOS 2017).

This study is related to the major recovery project of an 18th century oil painting on canvas (56,5 x 70,7 cm) from Vrlika, a small Croatian town in the hinterland of Split - Dalmatia County. Considered as the most valuable sacral and cultural object of Vrlika, it depicts *Our Lady of the Rosary* celebrated as the patron saint of the parish community and its surroundings. The painting was bought for the community by Fra Filip Grabovac (1698 - 1749), important Croatian Franciscan priest, patriot and a writer, during his serving as a military chaplain in the Venetian terrestrial formations (Novosel, Čoralić 2015). Originally hanged on the main altar of parish church, it was utilized in a century long rosary processions, while being publicly displayed and carried by the townsmen [Figure 1].

—History and context

During the Croatian War of Independence in 1992 the Serbian paramilitary units of the so called SAO Krajina devastated the interior of the church and all of its sacral objects and artworks. Taken off the main altar, the *Our Lady of the Rosary* was heavily vandalized. The central part of the composition, including almost the complete figures of Virgin Mary and the Child, was cut-out and taken away [Figure 2].

After four years of occupation, following the Operation Storm in 1995, the town of Vrlika and the surrounding territory were liberated. In this period an *ad hoc* stabilization treatment was applied on the painting - the additional plywood board has been mounted from the back onto the remains of the original canvas support.

Afterwards, the whereabouts of the painting remained unknown, while another image, depicting Virgin Mary and the Child, took its position on the main altar. However, a century long tradition of annual procession in Vrlika ceased from then on.

Following an official investigation in 2017, the location of *Our Lady of the Rosary* was rediscovered. Due to the importance of the worshipped artwork, the idea arose among the group of Franciscans from Vrlika to examine the possibilities for its recovery. By cross referencing the available visual materials, including a high resolution



Figure 1. - a) Archive photos. Procession a) from the start of the 20th century, and b) from the end of the 80-ies. Photographs courtesy of Fr. Ivan Režić.

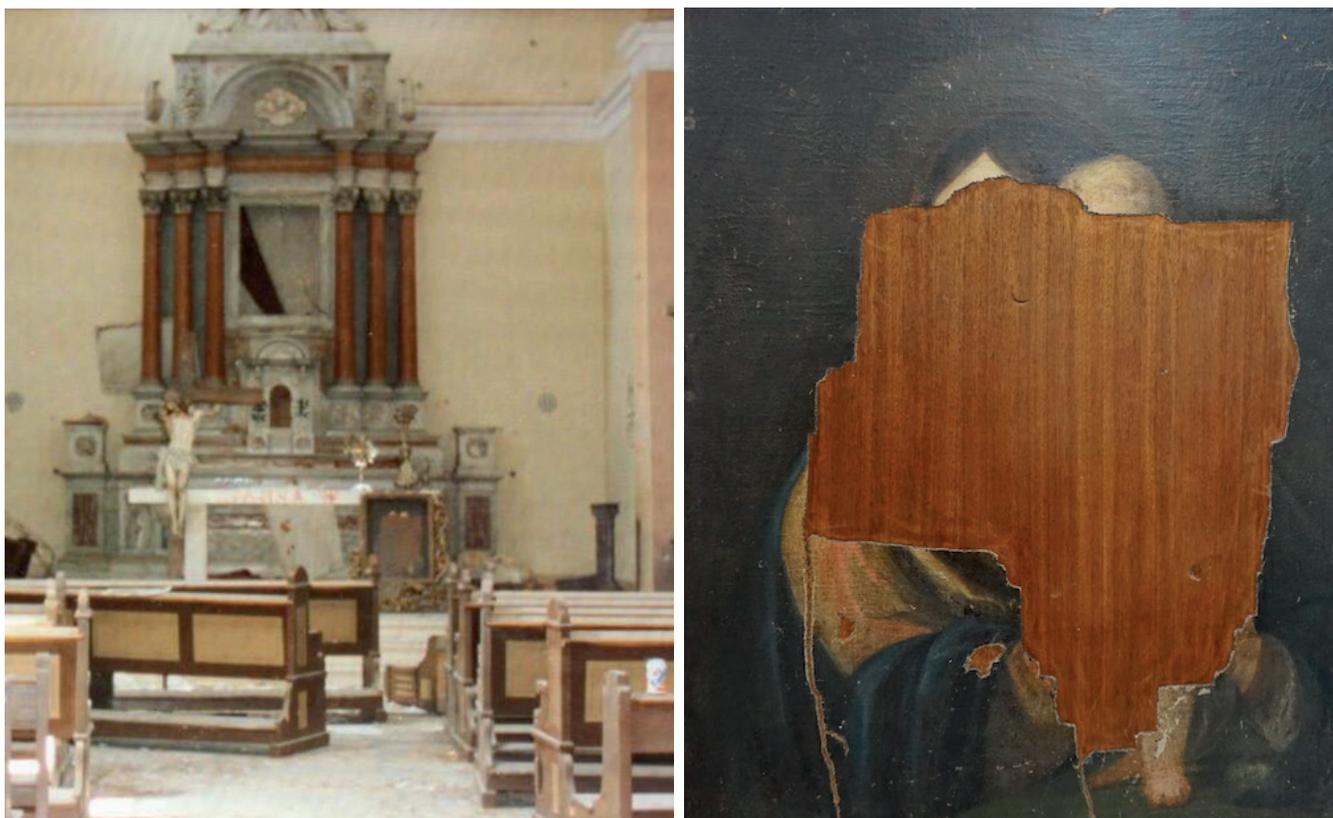


Figure 2.- a) 1a) 1992 - tragic end of a symbol, archive photo. Photograph courtesy of Fr. Ivan Režić. b) Vandalized central part of the painting (the painting state as found in 2017).

old black and white photograph and the low resolution coloured photograph, the online image colorization algorithm, as well as relying on the detailed visual analysis of the original paint layer, the complex one-year project was initiated. The project's primary intent was to re-establish the procession of "Our Lady of the Rosary" that ceased for the last 26 years.

This paper is divided into two main parts. Besides the short insight into general theory on restoration of vandalized artworks, the first part of the paper analyses the circumstances which made the reconstruction preferable form of the restoration as well as the conditions that made it possible. The second one deals with the technical execution and the challenges related to this type of intervention. A particular interest in the opposing views of the authenticity and the social value of the artwork is given.

Dealing with vandalised artworks

According to Oxford dictionary the *act of vandalism* is defined as the crime of destroying or damaging something, especially public property, deliberately or for no good reason. When speaking about vandalism against the works of art, the objects are usually left in place following the act of transgression. Oftentimes the religious or political content of the artwork can amplify its susceptibility to vandalism. The images of the idealized womanhood,

such as the Virgin Mary (Cordess and Turcan 1993), are considered particularly vulnerable. The overview of an art vandalism, including historical, criminological, sociological, and psychological accounts, can be found in writings of Gamboni (2013), while the list of artworks from the public art institutions, vandalized during the period between 1977 to 2007, is given by M.J. Williams (2008). Although no detailed description of the available case studies of art vandalism is intended here, only a brief outline of several interesting restoration projects will be presented in order to show three different approaches to recovery of vandalized artworks, namely the absence of any form of reconstruction, the reconstruction of the losses in grey scale, and the total (invisible) reconstructions, respectively.

When speaking about the war-damaged artworks, the absence of any sort of intervention is evident in the presentation of the artworks from the Berlin's New Bode Museum, which were also heavily damaged during WWII. Fragmented sculptures and paintings were preserved without any intent to recover the lost form. Moreover, they were exhibited to the public in damaged state in 2015 with the objective to explore the ethics behind the restoration of war damaged art (Chapuis and Davis 2015).

However, not all post-war projects are led by the same idea of non - reconstructions. The recovery project of the cycle of 15th century frescoes by Andrea Mantegna from the Eremitani church in Padua (Italy), damaged in Second World War (WWII), is certainly one of the most remarkable

examples. The reconstruction was based on the extensive archive documentation of the frescoes' state prior to the destruction while computer based reconstruction was also used (Fornasier and Toniolo 2005). Namely, the project assisted in the comparison of the old gray level images and those of the preserved fragments of the fresco (Ramlau 2009). The reconstruction of the lost figural and architectural forms was made in gray scale while all the fragments that had been saved in 1944 were placed to their authentic position within the composition.

On the other hand, the invisible interventions, of the heavily vandalized paintings kept in the museums, are implemented regularly in numerous restoration projects (Harding et al 1989; Barker and Ormsby 2015; Beentjes 2019). Interesting examples include three restoration projects of vandalized paintings by Rembrandt, Vermeer and Van Gogh during 1970's from the Rijksmuseum. The paintings were restored using the typical methods and the materials used at the time, and also retouched in a mimetic way (Dujin 2018). In 1988 restoration of three Albrecht Dürer's masterpieces from the Alte Pinakothek Museum, Munich (Germany) followed the same methodological approach. Particularly, it was applied in the case of painting depicting *Mary as Grieving Mother* (1496) where the large portion of the face and the neck were totally destroyed (Heimberg 1990).

In case of the painting *Our Lady of the Rosary*, the first two approaches - the absence of any form of reconstruction and the reconstruction of the loss in grey scale were not an option. Namely, two main objectives guided this project. The first one was the revitalization of the social fabric of the Vrlika community, while second was to ensure the safekeeping of the painting by returning its practical social function that was lost. Thus the only option to achieve these goals was the invisible reconstruction of the central damage.

Documenting and registering the surviving attributes

As mentioned earlier, in the early post-war period, the painting had been lined onto a new support - the plywood board - like a 'marouflage', in order to give it increased strength. Aesthetic treatments, i.e. infills and inpainting were not performed. Lining was done with traditional wax-resin paste, a typical lining substance used at that time in Conservation Department for Dalmatia (Šustić 2018). The application method, that included heated surface pressure imposed from the front side of the painting, has left a visual mark on the authenticity of the paint layer. Namely, besides the question of altered tonal values (Oudheusden 2014), the area around the perimeter of the major loss seemed evidently flattened than the rest of the painting surface. This kind of treatment changed its texture and the features of all original materials irreversibly. However, the paint layer was completely stable, indicating no signs of blisters nor flaking. Moreover, the plywood board was also

in good condition, as well as the lining adhesive that didn't show any signs of deterioration. Thus, it was decided that there was no need for de-lining treatment and that this intervention could be left as part of the painting's history.

—Perceptual analysis of the central damage

According to Arnheim (1982: 25), a loss can increase or decrease its magnitude in direct proportion to its location within the pictorial composition, i.e. when the retouching of the significant figural loss is located in the centre of the painting it tends to draw more attention from the observer, than if it was placed near the marginal area of the canvas. The vandalized *Our Lady of the Rosary* is rather an extreme example of a severe interruption of the central part of the composition. Digital forensics using the free and open source image editor GIMP (GNU Image Manipulation Program) (2019) made evident that the extent of the loss measured 28.1%, while 71.9% of the painting is completely preserved.

However, the content of the composition in the preserved area is rather scarce, there are only a few strong focal points of the foreground, such as the top of the figures' heads, the bright red part of the drapery, and the lower part of Child's legs, while the tonality of the midground and the background is composed of dark colours. Thus, the juxtaposition of the loss and the preserved area of the painting, covering four outer edges, creates the impression of a framed scenario. In turn, this adds a strong context to the object centre, i.e. the loss (Brandt 1963: 71-76). The leading lines of the compositional elements, that carries on into the background are abruptly discontinued in the foreground, again contributing to the perception of the loss as a point of interest grabbing the attention of the observer and thus leading his/her eyes away from the preserved part of the image (Maisey 2015).

—Visual examination of the painting technique

In order to understand the features of the painter's technique, all figural parts, including the draperies, have been studied in close detail. On the edges of all lacunas, a pale brown preparatory layer was detected. This layer set out an overall medium tonality which the painter used as a part of the coloring. Most of the modelling was done using the *wet-in-wet* system of paint application, while superposition of the paint layers was detected only in area of the Virgin's red drapery. The painter's palette was rather limited: few dominant hues, presumably lead white and vermilion, while earthy and ochre tones predominated. The observations under the raking light revealed further particularity, especially the high degree of paint viscosity in the area of skin tones, while the background was executed in thin paint application. These findings informed the selection and the application of the retouching materials in the reconstruction process.

Key references for the reconstruction process

The following three key references guided the reconstruction process: the digitized black and white photograph from 1987, the low resolution printed colour photographs from 1992 [Figure 3], and the results of the online image colorization algorithm, respectively.

—Digitized black and white photograph from 1987

The photograph was digitized to a dimensions of 3470 x 4338 pixels, using resolution of 300 dpi. As the photograph was black and white, it lacked the vital information on colour scheme of the missing area. As a result, the precise relationships between distinct hues can be considered rather speculative. This is particularly emphasized for the green and the red hues, as they may appear to be rather similar in value (Bailão 2012). Regardless of the obvious dilemmas, the archive photography provided crucial information on the missing composition, its surface topography, as well as the rendering of contrast and the values of the foreground. Moreover, due to angle of the light source placed next to the painting, the photograph revealed much of the textured surface.

— Printed colour photograph taken before 1992

The low resolution reproduction of a colour photograph taken during rosary procession was also available.

However, as the object in the photo was captured from a large distance, the colour perception of the missing area was extremely limited. Hence, only the overall features of the hues could be distinguished from this source material. Unfortunately, the original photographic print and negative were not preserved.

—Online image colorization algorithms

Using a digitized high resolution black and white photograph as input, the colorized versions were obtained using several free online colorization algorithms based on deep learning technique, namely DeepAI, Algorithmia, colorise.SG, Automatic Colorizer, and Neural Network-based Automatic Image Colorization. More details on the particular algorithms could be found in (DeepAI 2020, Zhang et al. 2016, colorise.SG 2020, Larsson et al. 2016, Iizuka et al. 2016). The advantage of this approach is due to a fully automated process not requiring any user interaction and is very simple to implement. However, utilizing an already pre-trained online colorization algorithms using a particular image dataset, resulted in a desaturated colorizations, as shown on figure 4. This is recognized as the so called “dataset bias” problem (Zhang et al. 2016). In order to obtain a plausible colour version of the black and white photograph would thus require retraining the algorithm using image dataset related to Our Lady of the Rosary, which was not available in this case. Nonetheless, the results of colorization aided the



Figure 3.- Key references: a) Archive photo from 1987, high resolution photo, b) Low resolution photo (before 1992). Photographs courtesy of Fr. Ivan Režić.



Figure 4. - Key reference 3; colorization results using online sources, (a) DeepAI (2020), b) Algorithmia API (Zhang et al. 2016), c) colorise.SG (2020), d) Automatic Colorizer (Larsson et al. 2016), e) Neural Network-based Automatic Image Colorization (Iizuka et al. 2016).

construction of characters' flesh tones during the latter underpainting stage of the reconstruction process.

Reconstruction of the central part of the image

— Missing canvas

Due to the painting's attachment to the plywood board, it was not possible to conduct a detailed visual study of the characteristics of the original canvas. However, the selection of the (new) lining canvas, for the reconstruction of the damaged area, was made by analysing its thickness, perceivable at the perimeter of the loss. Prior to lining, the canvas was stretched on a squared stretcher, brushed with water, then re-stretched, and left to dry completely. This process was repeated several times. Finally, the canvas was sized with diluted rabbit-skin glue and allowed to dry. The aim was to adjust its condition and physical properties to that of the original, in order to avoid possible contraction

during exposure to the subsequent treatment materials as well as various climatic conditions after the treatment. For the same reasons, the decision was made to follow the lining method from the previous intervention, i.e. traditional wax-resin adhesive, for mounting it onto the area of loss (the plywood board) (Hackney 2013). The selection of this method will be addressed in final discussion.

The wax-resin adhesive was melted and applied to the reverse of the lining canvas and on the plywood board. After the lining canvas was cut to a required shape, it was carefully attached to the area of loss with the impregnated area lying face down on the plywood board. The area was covered with a sheet of Melinex and bonded using a hand-lining iron. Special attention was given while lining the perimeters of the new canvas so to avoid any possibility of affecting the original paint layer. After the lining canvas had cooled to room temperature, excess wax that had penetrated to the front was removed by wiping with white spirit.

—The ground layer

Given the preferable requirements, such as small drying shrinkage, elasticity and easy workability, the mixture of Chalk from Champagne, Plextol B 500 and D 498, with the addition of Methyl cellulose and barium sulphate, was chosen for the reconstruction of the ground layer (Portsteffen 2013). Prior to the application on the central loss, small lacunas were first covered in order to explore its adhesion to substrate and compatibility with the retouching system. The care was taken to ensure that the ground layer followed the texture perceived from the black and white photo, as well as of the surrounding painted layer. Thus, the chalk was applied and shaped under the raking light. Following a drying process, an isolation layer consisted of 7% solution of shellac in ethanol was brushed onto the surface to reduce its absorbency (Knut 1999).

—Underpainting in gouache

The underpainting of the missing composition was done in gouache in several main steps. First, a uniform pale

brown layer was brushed on. The aim of this step was to imitate the original preparatory layer and reduce the luminosity of the white ground that would affect the colour of subsequent layers. After drying, the surface was again isolated using a 5% solution of shellac in ethanol to reduce its absorbency. Employing an optical image projector (LCD projector), the lost figural composition was transferred onto the painting surface. Using the wet-in-wet system of paint application, the opaque monochrome underpainting was applied in umbra natural, ivory black and titanium white in order to reassemble the main lights and shadows of the lost figural composition.

The final step of underpainting was guided by the results obtained using the image colorization algorithm. The faces of the Virgin and Child were mostly highlighted in white, while the position of earth pigments was located only in areas such as eye sockets, noses, mouths, cheeks, and necks. Small amounts of the shade resembling that of the vermilion were also noticed in the flesh tints. The *wet-in-wet* technique required a quick paint application as the smooth modeling of the skin tones had to be finished before drying. The umber from the underpainting was left partially visible on the surface [figure 5].



Figure 5.- a) Rebuilding of the missing canvas, b) Filling, c) Underpainting (second stage), d) Glazing technique.

— Glaze technique in resin medium

After the application of isolating varnish, composed of 25% damar resin dissolved in Shellsol D 40 (with the addition of 3% stabilizer Tinuvin 292), the long process of building transparent hatched layers was initiated. The paint based on the aldehyde resin Laropal A 81 was used in the process. Using small brushes, the transparent hatches of vermilion were spread over the areas of cheeks, mouth, and hands, while the glazes of umber, raw sienna and carbon black were applied over the shadow areas. Highlights from the underpainting were left almost entirely visible on the surface. The simulation of the age effects was achieved with splatter technique, in particular on the area of the dark background (Šustić 2015).

Discussion

—Methods and techniques

Due to the overall stability of the painting, the concept of recovery was based primarily on the aesthetic treatment. The area of loss was treated independently, while the original part of the painting was left intact. The aim was to avoid any hazardous methods that could impose further risks to the original materials. This has excluded the highly laborious intensive step of mechanical removal of plywood board as well as the question with what it should be replaced. Correspondingly, all materials from the past intervention were considered as an integral part of the painting history.

Furthermore, the decision was made to follow the lining method from the previous intervention, i.e. traditional wax-resin adhesive, for the attachment of the new canvas patch onto the plywood board. Although this paper doesn't question the disrepute of this material in general, the reasoning for its selection was guided by several benefits which, in this particular case, have outweigh the primary drawbacks of the material (Hackney 2013: 437; Oudheusden 2014). Namely, due to the relatively large dimensions of the loss (i.e. the lining canvas), as well as its central position within the image, the primary intention was to achieve the uniformity in behavior of the two canvases in conjunction with the plywood board. In this manner the physical properties of the lining canvas were adjusted to that of the original, while the possible contraction during exposure to various climatic conditions were minimized. Additionally, this was also relevant for the next stage of the recovery - the reconstruction of the ground layer. The intention was to avoid the possibility of deformations of the lining canvas when exposed to moisture absorption from the preparatory layer. Finally, the primary drawbacks of the method, i.e. the darkening and the colour change, will not impose any concern in this case, due to the fact that the wax - resin adhesive is restricted to the lining canvas exclusively (Bomford and Staniforth 1981). Thus, both the reconstructed ground layer as well as the pictorial reintegration will remain unaffected.

In order to achieve sufficient covering power and the ability to penetrate and conceal the lining canvas, acrylic polymer based preparation was chosen for the reconstruction of the preparation layer. It should be noted that the ground mixture was made white intentionally. Namely, the addition of earth pigments, necessary to achieve the required tonality of the original, would significantly increase the absorbency of the surface. This factor would make the work much more difficult, especially due to complexity of the paint handling in such a large scale figural compensation. However, the whiteness of the ground had to be annulated by the additional application of uniform toned gouache layer imitating the hue of the original preparation layer.

In order to achieve illusion of depth, luminosity and patina of the reconstructed area, the layering retouching system was employed – water based media was used in underpainting, while resin media was used in final glazing technique and simulation of age effects. In addition to fast drying, gouache paints were selected due to their non-toxicity and high coverage power preferable in imitating 'wet in wet' oil painting technique (Šustić 2015). Using the wet-in-wet system of paint application, the attempt was made to imitate the painter's brushstroke, with respect to size, movement and density of the paint.

It is important to emphasize that during the early stages of monochromatic underpainting, the digitized black and white photograph from 1987 was of outmost importance. Namely, the absence of colour distractions helped to focus

on the composition itself, especially for discerning the subtle gradation of nuances of the skin tones. During the latter underpainting stage, the colorized image aided the construction of characters' flesh tones.

Final tonal matches were achieved with pigments in Laropal A 80. By varying the pigment volume concentration and by varying the numbers of glaze layers the tonal intensity of the paint was adjusted to resemble the visual appearance of the original paint layer, while remaining distinctive on close inspection. The hues of the characters' pupils and the rosary, respectively, whose original color was difficult to determine, were left in neutral monochromatic tones of the underpainting.

—*Thoughts on ethics: was the recovery acceptable?*

As stated by Philippots (1996), "any reconstruction, based on fragments, iconographic documents or descriptions, can refer only to the knowledge of the lost object which cannot be identified without falsifying. In such cases, it is recommended that the materialization of the object should be made in drawings or models, but never in actual reconstruction of the object".

However, an exception can be made, as Philippots continues: "the reconstruction is justified for the object that has retained a practical social function and its context in traditional societies" (1996: 352). The question then is could the painting of *Our Lady of the Rosary* be qualified as such? Regardless of certain ambiguities, the type and the amount of key references was considered as sufficient for this particular project. However, the extent and the content of the reconstructed area raises questions about the artistic intent and the associated emotional responses. Although 71.9% of the painting is original and completely preserved, how authentic could this work of art be considered? Could the social impact of the artwork itself be justified as a more important compared to that of the authorship?

On the other hand, what if a copy of the painting has been made instead of the full recovery of the original? Would the vandalized painting have the same luxury of safekeeping as it has now, following the reconstruction?

From 1972 onwards, in the spirit of The World Heritage Convention, reconstruction has been viewed from the perspective of the so called "Outstanding Universal Value" (OUV), i.e. as acceptable when giving a meaning to the designated landscape or where it is considered as means of having an idealised image that could forge a national identity (ICOMOS 2017). The use of these sources permits the elaboration of the specific social dimension of the recovery of *Our Lady of the Rosary* which can be considered as "outstanding" for the community of Vrlika. Intangible factors, such as the customary belief, the livelihood activities of the community concerning the annual feast,



Figure 6.- a) Detail from the finished reconstruction, b) Re-establishment of a tradition, 2017 feast Photographs courtesy of Fr. Ivan Režić.

and the inhabitants' relationship to its history, reaffirm this perspective. Viewed in this regard, the painting, if lost, could be essentially irreplaceable and the reconstruction of the loss can be considered as a critical element to the persistence of those immaterial values.

Under these particular circumstances, the terms "spirit" and "location", introduced in The Nara Document on Authenticity (ICOMOS 1994), play also an important role, as they are transmitted by the religion of people. Namely, according to Petzet (2009) the aura of a place or an object embodied by the *genius loci* is also an important criterion as far as the question how to restore, or, under certain conditions, reconstruct the object. Due to vandalism, the *genius loci* of the parish community in Vrlika was disrupted for 26 years and thus the reconstruction to the pre-trauma state concerned not only the material object but also the social structures [figure 6]. In the same sense Viñas (2002), has talked about the identity as the most important aspect of the social values of conservation objects. While referring on contemporary ethics, he concluded that conservation is done primarily for the sake of the users for whom the object performs any function, tangible or intangible. Given the function that the *Our Lady of the Rosary* has for its users in Vrlika, this project resulted not only in the recovery of a worshiped cult image, but also in the re-establishment of a century long tradition of rosary procession and customs of her popular cult.

Conclusion

The case of Our Lady of the Rosary offered an unusual opportunity to approach the object from the viewpoint of the requirements for the practical function. Despite the open-ended discussion – both on methods and ethics of the project - a conscious choice was made to engage into such complex and demanding reconstruction. The two main objectives led the project. The first one was the revitalization of the social fabric of the Vrlika community, while second was to ensure the safekeeping of the painting by returning its practical social function that was lost.

The concept for the gradual reconstruction of the major loss was guided by the archive documentation, visual scrutiny

of the painting, and computer based reconstruction. Even though certain weaknesses arise from each of these references, they all proved to be important tools in the comparison leading to a greater understanding of the paintings condition prior to vandalism. They have also informed and guided careful application of each paint layer in the reconstructing process.

Regardless of the re-established formal unity of the painting, the act of vandalism as well as the recovery treatments that followed (structural one performed immediately after the war, and the present, aesthetical one, achieved two decades later) have become an integral part of painting's history. Finally, it can be concluded that the recovery of such artworks, with dramatic losses, is an extremely complex social phenomenon that is difficult to characterize by any general factor or through any general approach.

References

- ALESHINA, T.P. (1992). "Some Problems Concerning the Restoration of Rembrandt's Painting Danaë". Symposium in Nationalmuseum Stockholm. *Rembrandt and His Pupils, Stockholm: Nationalmuseum*, 223-33.
- ARNHEIM, R. (1982). *The power of the centre*. Berkeley: University of California Press.
- BAILÃO, A. (2012). "Colour discrimination in conservation students: the Farnsworth-Munsell 100– hue test". *Ge-Conservacion*, 3: 105-116. <https://doi.org/10.37558/gec.v3i0.102> [accessed: 14/3/2020].
- BARKER, R., ORMSBY, B. (2015). "Conserving Mark Rothko's Black on Maroon 1958: The Construction of a 'Representative Sample' and the Removal of Graffiti Ink", *Tate Papers*, 23. (2015). <https://www.tate.org.uk/research/publications/tate-papers/23/conserving-mark-rothkos-black-on-maroon-1958-the-construction-of-a-representative-sample-and-the-removal-of-graffiti-ink>. [accessed: 14/3/2020].
- BEENTJES, T. (2019). *Casting Rodin's Thinker: Sand Mould Casting, the Case of the Laren Thinker and Conservation Treatment Innovation*. Doctoral dissertation, Universiteit van Amsterdam.
- BOMFORD, D., STAINFORTH, S. (1981). "Wax-Resin Lining and Colour Change: An Evaluation", *National Gallery Technical Bulletin*, 5: 58–65.
- BRANDI, C. (1963). "Il Trattamento delle lacune e la gestalt psicologie". *Acts of the Twentieth International Congress of the History of Art: Problems of the 19th and 20th centuries*. Vol. 4. Princeton: Princeton University Press, 71–76.
- CHAPUIS, J., DAVIS, W. (2015). "Das verschwundene museum", *Staatliche Museen zu Berlin*. <http://das-verschwundene-museum.smb.museum>. [accessed: 14/3/2020].
- ColouriseSG (2020). *Colouriser specifically for old Singaporean photos*. <https://colourise.sg>. [accessed: 20/4/2020].

- CORDESS, C., TURCAN, M. (1993). "Art Vandalism", *British Journal of Criminology*, 33: 95-102.
- DeepAI (2020). *DeepAI Image Colorization API*. <https://deepai.org/machine-learning-model/colorizer>. [accessed: 20/4/2020].
- DUIJN, E.V. (2018). "Vandalism and the Rijksmuseum: three vandalized paintings restored by Luitsen Kuiper in the nineteen seventies", *CeROArt. Conservation, exposition, Restauration d'Objets d'Art* (No. HS). Association CeROArt asbl. <http://journals.openedition.org/ceroart/5573> [accessed: 14/3/2020].
- FORNASIER, M., TONIOLO, D. (2015). "Fast, robust and efficient 2D pattern recognition for re-assembling fragmented images", *Pattern Recognition*, 38(11): 2074-2087.
- GAMBONI, D. (2013). *The destruction of art: iconoclasm and vandalism since the French Revolution*. London: Reaktion books.
- HACKNEY, S. et al. "Lining easel paintings". *Conservation of Easel Paintings*, Hill Stoner, J., Rushfield r., (eds.). London and New York: Routledge, 415-453, 424-432, 437.
- HARDING, E., et al. (1989). "The Restoration of the Leonardo Cartoon", *National Gallery Technical Bulletin*, 13: 5-27.
- HEIMBERG, B. (1990), "The Munich Dürer attack: Conservation and Restoration of the damaged panels", *Studies in Conservation*, 35(1): 184-187, 186.
- ICOMOS (1994). *The Nara Document on Authenticity*. <https://www.icomos.org/charters/nara-e.pdf>. [accessed: 14/3/2020].
- ICOMOS (2017). "Guidance on Post Trauma Recovery and Reconstruction for World Heritage Cultural Properties document", working document prepared by the ICOMOS in response to the request by a World Heritage Committee, Paris. <http://openarchive.icomos.org/1763/>. [accessed: 14/3/2020].
- IIZUKA, S.; SIMO-SERRA, E.; ISHIKAWA, H., (2016). "Let there be color! Joint end-to-end learning of global and local image priors for automatic image colorization with simultaneous classification". *ACM Transactions on Graphics (ToG)*, 35(4): 1-11. <http://iizuka.cs.tsukuba.ac.jp/projects/colorization/web/>. [accessed: 20/4/2020].
- KNUT, N., WESTPHAL, C. (1999). *The restoration of paintings*. Köln: Könemann, 253.
- LARSSON, G., MAIRE, M., and SHAKHNAROVICH, G., (2016). "Learning representations for automatic colorization". In *European Conference on Computer Vision*, Springer, Cham, 577-593. <http://colorize.ttic.edu>. [accessed: 20/4/2020].
- MAISEY, S. (2015). "Retouching and reconstruction of major compositional losses in paintings: The use of digital reconstructions based on related historical material". *3rd International Meeting on Retouching of Cultural Heritage (RECH3)*, Portugal: Escola Artística e Profissional Árvore, 191-198.
- MORA, P. et al. (1996). "Problems of presentation". *Historical and Philosophical Issues in the Conservation of Cultural Heritage*. Stanley Price, N. et al., (eds.). Los Angeles: Getty Publications, 343-354, 345.
- NOVOSEL F., ČORALIĆ L. (2015). "Vojni kapelani zavičajem s istočnoga Jadrana u mletačkim kopnenim postrojbama u 18. stoljeću", *Croatica Christiana periodica*, 39(76), 83-99. <https://hrcak.srce.hr/151859> [accessed: 14/3/2020].
- ODHEUSDEN, S.V. (2014), "The procedure of wax-resin linings by the painting restorers Johannes Albertus Hesterman (1848-1916) and sons". *CeROArt. Conservation, exposition, Restauration d'Objets d'Art* (No. EGG 4). Association CeROArt asbl. <https://doi.org/10.4000/ceroart.4081>. [accessed: 14/3/2020].
- PETZET, M. (2009). "Genius loci – the spirit of monuments and sites". *Conserving the authentic: essays in honour of Jukka Jokilehto*, Stanley-Price, N., King, J., (eds.). Rome: International Centre for the Study of the Preservation and Restoration of Cultural Property. 63-68, 67.
- PHILIPPOT, A., PHILIPPOT P. (1996). "The Problem of Integration of Lacunae in the Restoration of Paintings". *Historical and Philosophical Issues in the Conservation of Cultural Heritage*. Stanley Price, N. et al., (eds.). Los Angeles: Getty Publications, 335-342, 337.
- PORTSTEFFEN, H. (2013). *Approaches to filling and reconstruction of losses*, lecture notes and printed materials, Department for Conservation and Restoration, Arts Academy of the University of Split, delivered 5 March 2013.
- RAMLAU, R. et al. (2009). "The application of joint sparsity and total variation minimization algorithms to a real-life art restoration problem". Article in *Advances in Computational Mathematics*, 31(1-3): 157-84.
- VIÑAS, S.M., 2002. "Contemporary theory of conservation", *Studies in Conservation*, 47(sup1): 25-34.
- ŠUSTIĆ, S. (2015). *Brief handbook about mimetic retouching*. Porto: Arvore, 36.
- ŠUSTIĆ, S., (2018). "Cvito Fiskovic i glavne značajke restauriranja umjetnina u Konzervatorskom zavodu za Dalmaciju", *Portal*, 9: 115-131.
- The GIMP Development Team, (2019). GIMP, Available at: <https://www.gimp.org>.
- Vandalism (2020). Oxford Online Dictionary. <https://www.oxfordlearnersdictionaries.com/definition/english/vandalism>. [accessed: 14/3/2020].
- WILLIAMS, M.J. (2008). "Framing Art Vandalism - A Proposal to Address Violence against Art", *Brooklyn Law Review*, 74: 581-631.
- ZHANG, R., ISOLA, P. and EFROS, A.A., (2016). "Colorful image colorization". In *European conference on computer vision*, Springer, Cham, 649-666.

Author/s**Sandra Sustic**
ssustic@h-r-z.hr

 Croatian Conservation Institute - Šibenik
 Department for Conservation

Sandra Sustic has a degree in conservation-restoration of easel paintings and polychrome wood at the Arts Academy of the University of Split (UMAS) in 2007 and a Ph.D. in Art History (Department for Protection of Cultural heritage) at the Faculty of Humanities and Social Sciences in Zagreb, Croatia in 2016. Presently, she is head of Šibenik Department for Conservation of the Croatian Conservation Institute, and associate lecturer at UMAS (Department for conservation-restoration). Her fields of research are theoretical and practical aspects of retouching paintings, technical art history, historically informed reconstructions of paintings and history of conservation practice.

Exposed to High Frequency Fields". He is assistant professor at the Faculty of electrical engineering, mechanical engineering and naval architecture (FESB), University of Split. His research interests are numerical modelling including finite element and moment methods, computational bioelectromagnetics and heat transfer related phenomena.


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**Ivan Rezic**
tisina.1978@gmail.com

 Franciscan monastery of Fr. Ante Antić
 Put iza nove bolnice 10 C, 21000 Split,
 Croatia

Ivan Rezic is a Franciscan monk, priest and a writer. He graduated at the Catholic Faculty of Theology, University of Split in 2009. From the academic year 2011/2012 he attended postgraduate studies at the Pontifical University Antonianum in Rome. In 2015 he gained Master's Degree in theology with a specialization in spirituality and was the recipient of the Best Student of the Year award. He is currently at the final stage of finishing his PhD at the same University. Since June 2018 he was the educator of Franciscan novices and a lecturer of Franciscan spirituality at the island of Visovac (Croatia). In addition to the activities closely related to the invitation of monks and priests, he published two poetry collections and initiated conservation projects of several sacral artefacts, among which was the canvas painting *Our Lady of the Rosary* from Vrljka (Croatia).

**Mario Cvetkovic**
mcvetkov@fesb.hr

 The Faculty of Electrical Engineering,
 Mechanical Engineering and Naval
 Architecture, University of Split. Ruđera
 Boškovića 32, 21 000, Split, Croatia

Mario Cvetkovic received the B.S. degree in electrical engineering from the University of Split, Croatia in 2005. In 2009 he obtained M.Phil degree from the Wessex Institute of Technology, University of Wales, UK. In December 2013 he received Ph.D. from University of Split, Croatia, for the thesis entitled "Method for Electromagnetic Thermal Dosimetry of the Human Brain