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COLOURS OF THE PAST: CONSIDERATIONS ON PHOTOGRAPHIC COLOURISATION OF ARCHIVAL PHOTOGRAPHS

INTRODUCTION

A key concept in photography consists of technological progress meant to ease the work of photographers. From the first photograph to the first colour photograph, to the present day when anyone can capture moments in a split second, everything has been built on the desire for progress. This paper aims to approach the colourisation of black and white archival photographs using artificial intelligence from multiple perspectives. This process raises several questions: who benefits from this approach, is it ethical to colourise photographs taken in black and white, is automatic colouring via artificial intelligence accurate, etc.? Studies in technology and artificial intelligence reduce the motivation to colour because of the technological limitations of the period in which the photographs were taken. On this, in a paper on the benefits of the deep convolutional neural network (CNN) colouring procedure, Joshi et al. point out that in the past photographs were black and white due to technological limitations, while today colour photographs have become a part of everyday life.¹

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1 Madhab Raj Joshi, Lewis Nkenyereye, *et al.*, 'Auto-Colourisation of Historical Images Using Deep Convolutional Neural Networks', *Mathematics*, 8 (12) (2020), 2258; <https://doi.org/10.3390/math8122258> [accessed 20.08.2022].

Reducing the issue of colourisation to such an argument is insufficient because in many cases the central issue is not technological limitation, but rather intentionality and artistic choice. One can only wonder if Steven Spielberg would be thrilled to see *Schindler's List*, a film conceived in black and white, coloured in eerie colours just because the audience demands it. Of course, achieving colourisation without human intervention by simply training a program based on pre-existing data would reduce the degree of subjectivity, as well as reducing colouring time. This paper aims to discuss both the advantages and disadvantages. The debate on colourisation is by no means a novel one, it has been going on since the first attempts to colourise photographs by hand. One such example is Felice Beato, whose hand-coloured albums from the 1860s were acquired by the Getty Museum for preservation.² The controversy only arose later when in the 1970s film studios came up with the idea of colourising black and white films, simply arguing that this was the public's wish.³

The aim of this paper is not to discourage technological progress, but rather to bring to light the issues, drawbacks, and historical controversy behind the practice of colourisation. In the first part of this theoretical paper the rigors of the archival profession and what a photographic archive entails will be presented, followed by arguments for and against, and finally, the common elements and benefits that can result from collaboration between the two different fields of activity will be assessed.

THE CASE OF FELICE BEATO AND OTHER HAND-COLOURED PRINTS

The case of Felice Beato (1832–1909) deserves attention since he was an important commercial photographer of the nineteenth century. The Italian-born British photographer mastered technical aspects that allowed him to push photography beyond the technological limitations of the time, managing to make panoramas and hand-coloured photographs. Complementary to this, Beato also developed

² Sarah Freeman, Jim Druzik, *et al.*, 'Monitoring Photographic Materials with a Microfade Tester', *ICOM-CC 17th Triennial Conference Preprints* (September 2014), 15–19.

³ Chris Heckmann, 'The Debate over the Film Colourisation Process', *StudioBinder* (November 1, 2021), <https://www.studiobinder.com/blog/film-colourisation-definition/> [accessed 20.08.2022].

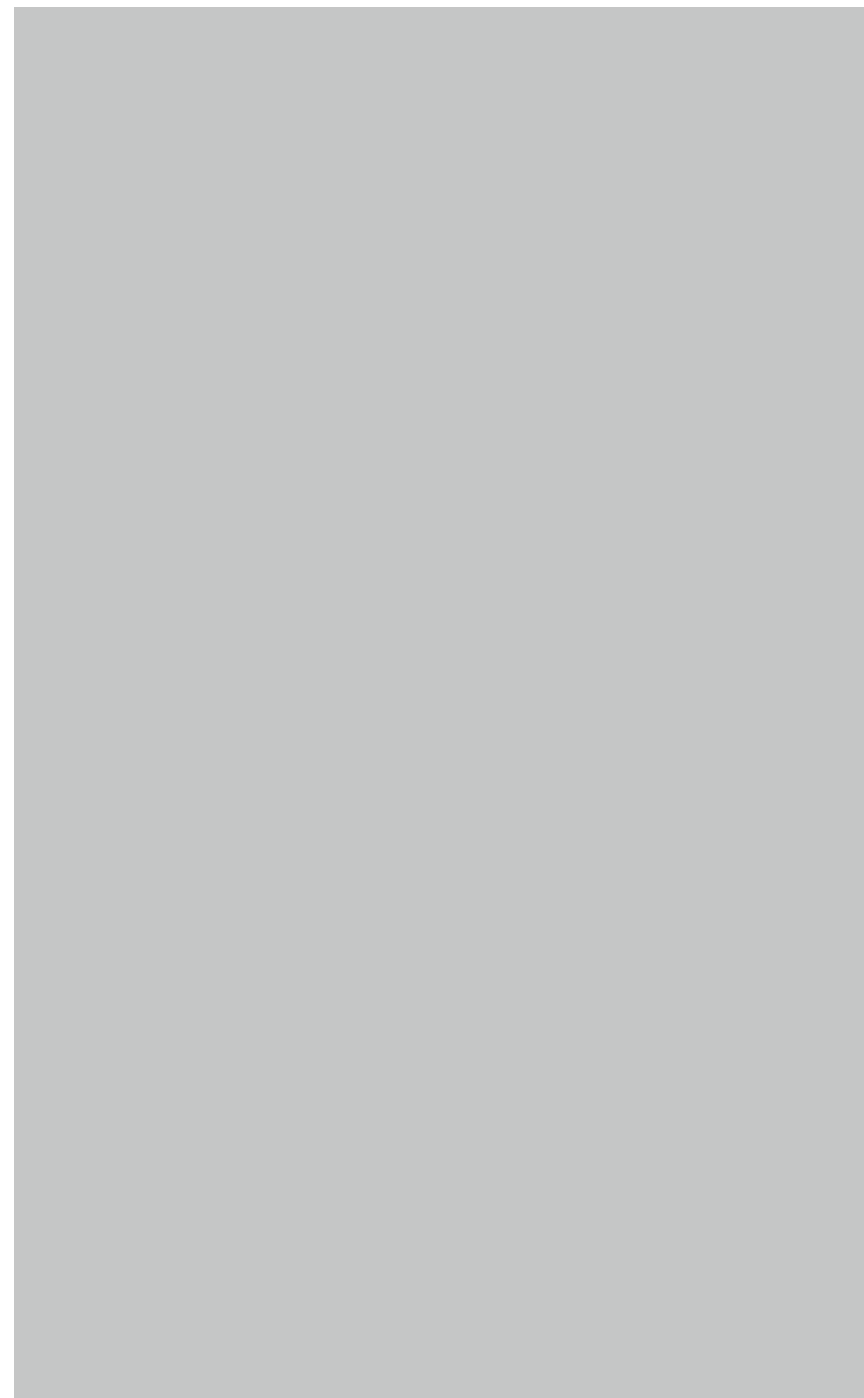


FIG. 1. PRIEST ATTRIBUTED TO FELICE BEATO (1869). PHOTO: THE MET COLLECTION, THE HORACE W. GOLDSMITH FOUNDATION FUND, THROUGH JOYCE AND ROBERT MENSCHER, 2017.

a natural flair for selecting interesting subjects for his clientele.⁴ Split between military photography and conflict zones, Beato also recorded Japanese culture in his photographs. Most of his photography was produced in Japan, earning him the title ‘the father of Yokohama photography’.⁵ This style of photography was also known as souvenir photography, at which Beato excelled, managing to garner considerable fame while developing the phenomenon. This type of photography generated fierce competition between photography studios.⁶ To some extent the works were similar, because the studios swapped subjects, clothes and backgrounds, and even the actors posing for the various images were easily identifiable.⁷ However, Felice Beato lied about Japanese culture. Instead of capturing the truth of the nineteenth century, which was the industrialisation of Japan, Beato captured what Western audiences wanted to see.⁸

Costică Acsinte (1897–1984) is a Romanian photographer who captured the inter- and post-war reality of Romania.⁹ In addition to photographs capturing people’s habits, or portraits, there are also some attempts at hand-coloured photography to be found in the archive. Figure 2 shows two photographs from the photographer’s collection, the one on the left is a military man delivering a speech, while in the background the Romanian flag held by a man is coloured, standing out from the rest of the photograph. In the photo on the right, the woman’s dress is coloured green and her shirt is coloured yellow; in addition, the vegetation in the background is lightly coloured. In his memoir, Ioan Morar describes a memory from the communist period in Romania, when a photographer came

4 Eleanor M. Hight, ‘Felice Beato: A Photographer on the Eastern Road’, *Trans Asia Photography*, 1 (2) (January 2011), https://doi.org/10.1215/215820251_1-2-209 [accessed 20.08.2022].

5 Ibid.

6 Nayla Maaruf, ‘Nineteenth-Century Japanese Tourist Albums at the Art Institute of Chicago: Complex Interpretation and Material Deterioration’, *The Book and Paper Group Annual*, 40 (2021), 144.

7 Ibid.

8 Julia C. Fischer, ‘Chapter 8 - Felice Beato, Pioneering Travel Photographer’, *Breaking with Convention in Italian Art* (Newcastle upon Tyne: Cambridge Scholars Publishing, 2017), 119.

9 Ana Maria Olteanu, ‘Povestea Lui Costica Acsinte, Fotografatul Care Ne-a Lasat Mostenire Emotia Perioadei Interbelice’, *Momente Istorice* (December 30, 2017), <https://momenteistorice.ro/costica-acsin-te/> [accessed 20.08.2022].



FIG. 2. HAND-COLOURED PHOTOGRAPHS FROM THE COLLECTION OF ROMANIAN PHOTOGRAPHER COSTICĂ ACSINTE. PHOTO: FLICKR, [HTTPS://WWW.FLICKR.COM/PHOTOS/COSTICAACSINTE/](https://www.flickr.com/photos/costicaacsinte/) [ACCESSSED 20.08.2022], THROUGH ASOCIAȚIA CULTURALĂ ATELIERELE ALBE AND MUZEUL JUDEȚEAN IALOMIȚA.

to the school where he was studying promising the students colour photographs in exchange for a considerable amount of money. In reality, the alleged colour photographs were just black and white photos with layers of colour added by hand, resulting in a fusion of photography and painting.¹⁰ Therefore, the motivations behind hand colourisation can be diverse and range from the photographer’s intention to experiment with this process, for aesthetic improvement or to generate profit. The latter two motivations are intertwined, because by adding colour the photographs become attractive to potential buyers.

10 Ioan T. Morar, *Fake News în Epoca De Aur: Amintiri și Povestiri Despre Cenzura comunistă* (Iași: Polirom, 2020), 165.

ARCHIVES AND THE DIFFICULTY OF WORKING WITH PHOTOGRAPHS

There were lots of debates regarding the use of photography as evidence for the past. According to Sandweiss, historians and photographers have a different relationship with their subjects because historians are always looking back, while photographers are always picturing the present. Even though the character of the photograph is to depict the present moment, what interests us is the permanent character of photographs.¹¹ The same author puts it more simply: the image lives, even as the subject dies. In photographs the young never grow old; the dead live forever.¹² In Roland Barthes' vision, a photograph does not necessarily express what no longer exists, but what certainly existed, thus becoming a certificate of existence.¹³ Furthermore, Martha Sandweiss argues that photographs give the appearance of an unmediated form of contemplating the past, although photographers have the ability to place subjects and choose the perfect setting and moment to make a photograph. Photographs, in the vision of Sandweiss, are static historical objects and therefore remain unchanged, while history is dynamic and prone to change.¹⁴ Summing up the aforementioned ideas, even if the photos deteriorate over time or did not seem important when they were taken, they represent the past.

IS EVERYTHING WORTHY OF BEING ARCHIVED?

As soon as people discovered photography, they began to document everything around them. According to Willers, the New York Daily Tribune estimated that three million daguerreotypes were being produced in 1853.¹⁵ That impressive number was just after the discovery of photography. Referring to this, Szarkowski considers

11 Martha A Sandweiss, 'Seeing History: Thinking about and with Photographs', *Western Historical Quarterly*, 51 (1) (2019), 1–28; <https://doi.org/10.1093/whq/whz098>, 4 [accessed 20.08.2022].

12 Ibid., 5.

13 Roland Barthes, *Camera Lucida: Reflections on Photography* (New York: Macmillan, 1981), 85.

14 Sandweiss, 'Seeing History: Thinking about and with Photographs', 7.

15 John Szarkowski, *The Photographer's Eye* (New York: Museum of Modern Art, 2007), 6.

a proportion of this number of photographs to have resulted from knowledge and skill, while the overwhelming majority were the result of chance, improvisation, or simple experimentation with the camera. As he goes on to say, photography had become something easy and accessible that recorded every moment.¹⁶

Adding to this view is Pasternak who considers the technological developments of the nineteenth and twentieth centuries to be beneficial for the less privileged social classes who, until then, could not document their habits and environment.¹⁷ In conclusion, regardless of whether the photographs are taken by professional or amateurs, no one takes photographs with the intention of using the photographs to understand the customs or culture of a particular period. Photographs find their place in cultural heritage. Coming to the issue of colourisation in the archival field, this paper will reflect on the ethical responsibility of archivists. The ICA Code of Ethics for Archivists provides a set of principles that have been adopted by several countries.¹⁸ This paper will focus on principles that prohibit archivists from intervening with archival materials for anything more than solely the preservation of documents.

The first principle addresses the archivist's obligation to preserve the integrity of archival material and to ensure that it continues to be a faithful record of the past. According to this first principle the practice of colourisation has no place in the practice of archivists because by colourising photographs they are no longer a testimony to the past but a reinterpretation. The next principle involves evaluating, selecting and maintaining archival material in its historical, legal, and administrative context. The third principle is the preservation of authenticity during the processing. These three principles are relevant to the practice of colourisation, which according to all three principles cannot be carried out as part of the archivist's profession.

16 Szarkowski, *The Photographer's Eye*, 7.

17 Gil Pasternak, 'Photographic Digital Heritage in Cultural Conflicts: A Critical Introduction', *Photography and Culture*, 14 (3) (March 2021), 253–268, <https://doi.org/10.1080/17514517.2021.1953763>, 257 [accessed 20.08.2022].

18 'ICA Code of Ethics', *International Council on Archives*, <http://www.ica.org/5555/reference-documents/ica-code-of-ethics.html> [accessed 14.06.2022].

COLOURISATION AND THE CONTROVERSY SURROUNDING IT

Before critically addressing the issue of colourisation, this paper will briefly outline what it entails. To see what colourisation means from a technical point of view, we will start with Popowicz and Smolka's explanation. According to their article, colourisation involves the introduction of colour into a black and white photograph. The difficulty lies in the difference between these types of image (colour and black and white) because the pixels of a digital colour photograph are more complex and hold three-dimensional information. In the case of black and white photos, only luminance is known, leaving two colour channels unknown to the program.¹⁹ This brings us to the issue of subjectivity in colouring photographic documents, because in most cases this process is not possible without human intervention. There is also much research²⁰ stating that colourisation intervention is performed without human mediation.

These automatic colouring models are always being updated and improved, with the goal of evolution leading to 'more realistic and reasonable'²¹ results than those generated by the previous model. However, we must consider that algorithms are 'only as good as the data they learn from'²² and that subjectivity cannot be removed altogether. The above perspective presents only a small part of all the discussions around this topic. Naturally, there are many opinions on the issue of colourisation involving researchers, retouchers, filmmakers, photographers, archivists, anthropologists,

19 Adam Popowicz, Bogdan Smolka, 'Overview of Grayscale Image Colourisation Techniques', *Colour Image and Video Enhancement* (Cham: Springer, 2015), 345–370, https://doi.org/10.1007/978-3-319-09363-5_12, 345 [accessed 20.08.2022].

20 Shanshan Huang, Xin Jin, *et al.*, 'Deep Learning for Image Colourisation: Current and Future Prospects', *Engineering Applications of Artificial Intelligence*, 114 (2022), <https://doi.org/10.1016/j.engappai.2022.105006> [accessed 20.08.2022]; Shanshan Huang, Xin Jin, *et al.*, 'A Fully-Automatic Image Colourisation Scheme Using Improved CycleGAN with Skip Connections', *Multimedia Tools and Applications* (April 2021), <https://doi.org/10.1007/s11042-021-10881-5> [accessed 20.08.2022]; Richard Zhang, Phillip Isola, Alexei A. Efros, 'Colourful Image Colourisation', *Computer Vision – ECCV 2016* (2016), 649–666, https://doi.org/10.1007/978-3-319-46487-9_40 [accessed 20.08.2022].

21 Shanshan Huang, *et al.*, "A Fully-Automatic Image Colourisation Scheme Using Improved CycleGAN with Skip Connections," *Multimedia Tools and Applications* (April 2021), <https://doi.org/10.1007/s11042-021-10881-5>, 25 [accessed 20.08.2022].

22 Douglas Heaven, 'Why Deep-Learning AIS Are so Easy to Fool', *Nature News* (October 9, 2019), <https://www.nature.com/articles/d41586-019-03013-5> [accessed 20.08.2022].

and historians. In the following section, this paper will address views both for and against colourisation.

CONSIDERATIONS AGAINST COLOURISATION

For starters, Libricz raises two fundamental issues when it comes to colourisation: 1) the issue of copyright of the work resulting from the colourisation process, and 2) the moral right of the owner of the photos. This issue has outraged the film world and caused much controversy.²³ Film directors did not want their work, conceived and executed in black and white, to be altered for the sake of studio profit, prompting filmmakers to react. Steven Spielberg argued that the decision to direct a film in black and white was not simply a matter of technical or financial difficulty, he believed that remaking a film was not simply a matter of applying colour, which could easily destroy the film product.²⁴ The issue of colourisation has become so pressing that important personalities have reacted. Five prominent personalities jointly signed an article critical of the colourisation problem. Woody Allen states that if a film director wants his film to be colourised, then there would be no problem, but if the director does not want it, then the film should remain black and white.²⁵

This argument comes down to the consent of the filmmakers, not the intent of the copyright holders. Another factor weighing against colourisation is removing photos from context or even recontextualising them. To illustrate what recontextualisation means, this paper will briefly present a notorious case in the world of colourisation. One editor did not stop at adding colour to portraits of torture victims in Cambodia, he went a step further and added subtle smiles to portraits in which the people had originally displayed

23 Joseph J. Libricz jr., 'Colourisation: Byting More than You Can Chew?', *University of Baltimore Law Forum*, 18 (1) (1987), <https://scholarworks.law.ubalt.edu/lf/vol18/iss1/4>, 6 [accessed 27.07.2022].

24 *Ibid.*, 17.

25 Woody Allen, Milos Forman, Sydney Pollack, *et al.*, 'Colourisation: The Arguments Against', *Journal of Arts Management and Law*, 17 (3) (1987), 79–93, <https://doi.org/10.1080/0735113.1987.9943107> [accessed 20.08.2022].

sad faces.²⁶ Strip the photos out of context and the viewer is left with the impression of seeing the portraits of happy people. Even if the photographs were presented alongside the original black and white photograph, the publisher cannot be cleared of blame.

This controversy questions the moral aspect of colourisation. How should someone who wants to colourise this type of photograph proceed? The only moral response is that the editor should not have interfered in any way with photographs of victims of a tragedy, because there is no justification and no way in which a human tragedy can be humanised. Another argument raised by Lindeperg and Szczepanska is the exploitation of photographic archives through reformatting and colourisation. The colourisation process is presented as the only solution to attract young audiences to history and cultural heritage. The example to be presented in this paper illustrates why technological limitations, often used as a justification for colourising historical documents, are actually in some cases part of the correct history.²⁷ As Lindeperg and Szczepanska argue, during World War II, those responsible for documenting war scenes had the choice of documenting scenes in black and white or colour.²⁸ The above argument is partly contradicted by the lack of colour material in Soviet propaganda. However, such material was produced to mark the Victory. To mark the triumph of 24 June 1945, the Soviets purchased rolls of colour film from Agfacolor. Despite bad weather which made some of the footage unusable, the film was a real success, succeeding in getting the public to associate colour film with the celebration of important events.²⁹ Thus, colour film was a window to the outside world, one through which others could see the most important achievements and turn them into memorable moments.

26 Kat Eschner, 'The Art of Colourizing Black and White Photographs of the Past Is Undergoing an Ethics Review', *Fortune* (May 12, 2021), <https://fortune.com/2021/05/12/colourizing-black-and-white-photos-pictures-of-the-past-historic-images-ethics-review-photography/> [accessed 20.08.2022].

27 Sylvie Lindeperg, Ania Szczepanska, 'Who Owns the Images? The Paradox of Archives, between Commercialization, Free Circulation and Respect', *Configurations of Film Series*, 4 (2021), 43–44.

28 *Ibid.*, 44.

29 Birgit Beumers, Phil Cavendish, 'Ideology, Technology, Aesthetics: Early Experiments in Soviet Colour Film, 1931–1945', *A Companion to Russian Cinema* (Chichester, West Sussex: John Wiley & Sons, 2016).

Precisely for this reason, the rare occasions when they chose to use the limited colour film available were carefully selected. If the alternation of black and white and colour shots is taken out of the picture by turning the entire narrative into colour, we lose a very important element, namely authenticity. In conclusion, the arguments against colourisation are moral obligation, respect for the intention of the original artist, and preservation of authenticity.

CONSIDERATIONS FOR COLOURISATION

In view of the arguments against colourisation, one can be tempted to argue for this practice. In the wake of the controversy over the Cambodian prisoners, an initiative was born to bring legitimacy to the practice of colourisation. This initiative is called the Colorizer's Code of Conduct. To consider the pro-colourisation aspects, this paper will briefly present the key points of the Code. The first principle is to respect the original work and implies that in the course of personal interpretation, the final result will not be used for malicious purposes and will not mislead the public. The next principle concerns the preservation of authenticity in order not to alter history. The next four principles consist of recognising that the publisher's work is only a derivative product, ensuring that the work supplements, not substitutes for, the original work, ensuring attribution and respecting copyright. The last two principles relate to not being malicious and to respecting the public good.³⁰

These eight principles are beneficial and provide a solid basis for integrating the practice of colouring ethically. In a paper addressing the automatic colourisation of archival photographs, Tsaftaris et al. argue that photographs resulting from the colourisation process can assist research and can be a backup in case the original work disappears or is destroyed. Another motivation for colourisation is to satisfy the consumer, thus being attractive to a wide audience.³¹ Another intriguing argument made by Terras et al. involves the

30 'Colorizer's Code of Conduct', *Colorizer's Code of Conduct* (2021), <https://www.ccoc.online/> [accessed 20.08.2022].

31 Sotirios A. Tsaftaris, Francesca Casadio, *et al.*, 'A Novel Visualization Tool for Art History and Conservation: Automated Colourisation of Black and White Archival Photographs of Works of Art', *Studies in Conservation*, 59 (3) (2013), 125–135, <https://doi.org/10.1179/2047058413y.0000000104>, 126 [accessed 20.08.2022].

mass digitisation of assets held by galleries, libraries, archives, and museums in order to generate new content to generate more profit. This concept involves providing access for reuse (by both amateurs and professionals) in order to co-create new artworks.³² While the arguments against colourisation focus on moral issues and respect for the past, pro-colourisation arguments take a different direction, specifically profitability, desirability, meeting consumer needs, and generating new works.

DISCUSSION

Following the literature review, it was possible to understand both the scepticism of researchers in the field of history, anthropology, and archival studies and the enthusiasm of those who want to facilitate the process of automatic colourisation. There is no doubt that the results generated by Artificial Intelligence are becoming increasingly accurate and compelling. Given that progress cannot be halted, there is a need for collaboration between experts in the humanities and those in the technology sector. Galleries, museums, and archival collections could benefit from new complementary products, even benefitting in financial terms.

For this collaboration to succeed, clear ethical rules need to be established, legal issues of copyright need to be clarified and authenticity needs to be respected. In a climate where disinformation is alarmingly on the rise, new products derived from this collaboration must not be a new factor adding to uncertainty and possibly contributing to rewriting history. Future research in the technical field should draw on archival experts and historians to generate historically accurate results, but also include ethical perspectives that go beyond technological limitations.

EDUARD-CLAUDIU GROSS: COLOURS OF THE PAST: CONSIDERATIONS ON PHOTOGRAPHIC COLOURISATION OF ARCHIVAL PHOTOGRAPHS

KEYWORDS: COLOURISATION; DIGITISATION; ARTIFICIAL INTELLIGENCE; PHOTOGRAPHY; DIGITAL HERITAGE

³² Melissa Terras, Stephen Coleman, *et al.*, 'The Value of Mass-Digitised Cultural Heritage Content in Creative Contexts', *Big Data & Society*, 8 (1) (2021), 1–15, <https://doi.org/10.1177/20539517211006165>, 3–5 [accessed 20.08.2022].

SUMMARY

This essay addresses the subject of the automatic colourisation of archival black and white photographs using artificial intelligence. In the context of digitisation, there is an increasing number of collections available. Since in most cases the photographs were taken in black and white due to technical limitations, rather than the artistic choice of the photographer, colourisation is potentially helpful for archivists and anthropologists in decrypting new meaning from archival collections. Colourisation is a process around which several questions revolve, both in terms of the usefulness of colourised photographs and the ethical dimension. This study reviews reasons both for and against colourisation. Research in the field of technology currently concentrates on technical details, with attention focused almost entirely on the process without looking critically at potential utility in other fields. Anthropologists, historians, archivists, and digital humanities researchers could benefit from these automated processes if they were made accessible. The main purpose of this paper is to initiate a debate that will result in an interdisciplinary collaboration between the technical and the humanities fields.

CV

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