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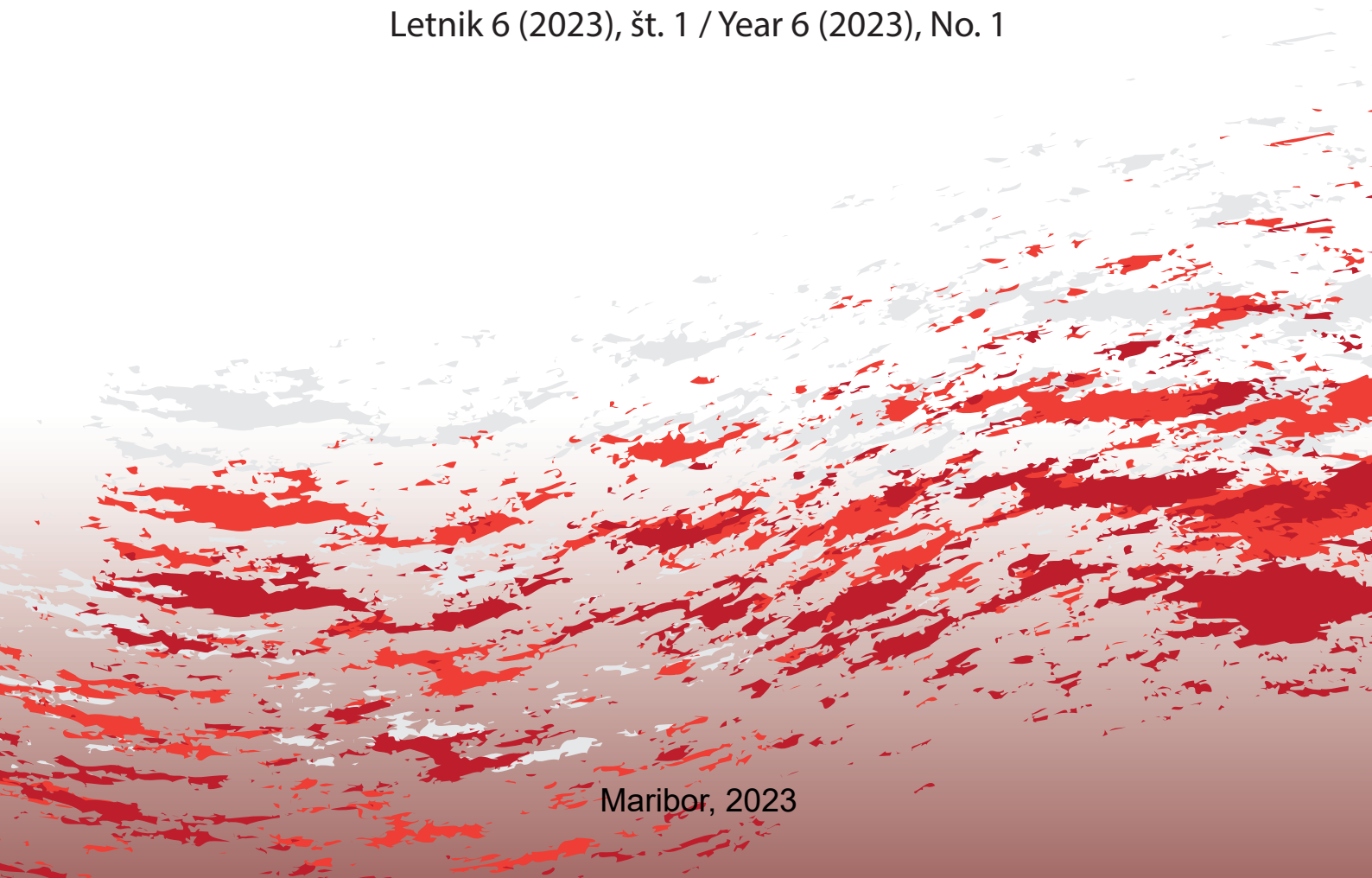

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USING AI IMAGE UPSCALER IN ARCHIVES

Saša Đukić
Archives of the Republic of Srpska, Banja Luka, Bosnia and Herzegovina
djusasa@gmail.com

Abstract:

AI image upscaling software can be a valuable tool for archives to improve the visual quality of their digitized collections. It enhances the resolution and quality of historical materials, making them more accessible to researchers and protecting fragile originals. However, it is important to use these techniques responsibly and ethically, with proper attention paid to issues of preservation, copyright, and privacy. There are several software programs that can be used for AI image upscaling in archives, and it is important to choose a program that produces accurate and realistic results.

Key words:

AI, Deep Convolutional Neural Networks, Image Upscaler, Archive

Izvleček:

Uporaba orodja AI Image Upscaler v arhivih

Programi za povečanje ločljivosti slik s pomočjo umetne inteligence (AI) lahko za arhive predstavljajo dragoceno orodje pri izboljšanju vizualne kakovosti njihovih digitiziranih zbirk. Ti programi izboljšujejo ločljivost in kakovost zgodovinskih dokumentov, kar omogoča raziskovalcem lažji dostop in varuje krhke izvirnike. Vendar je pomembno, da te tehnike uporabljamo odgovorno in v skladu z etiko ter ustrezno upoštevamo vprašanja ohranjanja gradiva, določbe o avtorskih pravicah in zasebnosti. Obstaja več programov, ki jih lahko arhivi uporabljajo za povečanje ločljivosti slik s pomočjo umetne inteligence. Pomembno je izbrati program, ki zagotavlja natančne in realistične rezultate.

Ključne besede:

umetna inteligenca, globoke konvolucijske nevronske mreže, Image Upscaler, arhiv

As archives continue to digitize their collections, the quality of the images they preserve and present to researchers is becoming an increasingly important concern. Many historical images, documents, and other media may have degraded over time, leading to low resolution or poor quality. This can make it difficult for researchers to fully appreciate the content of these materials. However, with the help of AI image upscaling software, archives can improve the visual quality of their digitized collections, making them more accessible and useful for researchers.

1. Introduction

There are many benefits to using AI image upscaling software in archives. For one, it can greatly enhance the visual quality of historical materials, making it easier for researchers to read and interpret documents or see fine details in photographs. This can lead to new insights and discoveries, as researchers are able to analyze materials that were previously too difficult to interpret.

In addition, by creating high-quality digital versions of degraded materials, archives can reduce the need for handling and exposure of fragile originals. This can help to extend the lifespan of these materials and prevent further deterioration.

Furthermore, AI image upscaling can help to increase the accessibility of historical materials. By creating high-quality digital versions of materials, archives can make them more widely available to researchers, regardless of their location or physical access to the originals.

There are several software programs that can be used for AI image upscaling in archives. Topaz Labs Gigapixel AI, Adobe Photoshop's Super Resolution feature, Let's Enhance, Waifu2x, and Image Upscaler are just a few examples. These programs use different AI upscaling techniques, but they are all designed to improve the visual quality of digital images by increasing their resolution and enhancing details.

However, it is important to note that there are ethical and technical considerations that must be taken into account when using these techniques in archives. For example, the use of AI image upscaling should not be seen as a replacement for the preservation and handling of original materials. While digitization can help to extend the lifespan of historical materials, it is important to preserve the original materials as much as possible.

It is also important to ensure that the use of AI image upscaling is done in a responsible and ethical manner, with proper attention paid to issues of copyright, privacy, and other concerns. For example, some archives may have restrictions on the use of materials that are still under copyright. It is important to ensure that the use of AI image upscaling does not violate these restrictions.

Furthermore, there are technical considerations that must be taken into account when using AI image upscaling in archives. For example, some software programs may produce results that are too artificial or unrealistic. It is important to choose a software program that produces results that are both accurate and realistic.

Some of the software are:

- Topaz Labs Gigapixel AI
- Adobe Photoshop
- Let's Enhance
- Waifu2x
- Image Upscaler

2. Topaz Labs Gigapixel AI

Let us take a closer look at Topaz Labs Gigapixel AI, one of the popular software programs used for AI image upscaling in archives.

Topaz Labs Gigapixel AI uses advanced machine learning algorithms to increase the resolution and quality of digital images. It can upscale images up to 600% without

losing detail or introducing artifacts, making it a powerful tool for archives looking to enhance the visual quality of historical materials.

One of the key features of Gigapixel AI is its ability to recognize patterns in low-resolution images and generate new image details based on these patterns. This allows it to create new, high-resolution versions of images that are more detailed and easier to interpret.

Gigapixel AI also uses a unique AI-based image sharpening technology that enhances image details and improves edge contrast. This helps to create images that are both sharper and more natural-looking.

Another advantage of Gigapixel AI is its batch processing capabilities. It can upscale multiple images at once, saving time and increasing efficiency for archives with large collections of historical materials.

One of the potential drawbacks of Gigapixel AI is its cost. It is a premium software program that requires a one-time purchase or subscription. However, for archives looking to enhance the visual quality of their collections, the investment may be well worth it.

Overall, Topaz Labs Gigapixel AI is a powerful and effective tool for AI image upscaling in archives. Its advanced machine learning algorithms, image sharpening technology, and batch processing capabilities make it a popular choice for enhancing the visual quality of historical materials.

3. Adobe Photoshop Lightroom

Adobe Photoshop Lightroom now uses AI to quadruple the size of your photos with its Super Resolution feature. To apply Super Resolution: Open a raw image, TIFF or JPEG in Loupe view. Select Photo > Enhance in the menu bar (or, Control-click on a Mac/right-click in Windows on the image) and click on Enhance.

4. Let's Enhance

Let's Enhance is an automated AI image upscaler and fixer. It uses Super Resolution technology based on Deep Convolutional Neural Networks along with other machine learning techs. A couple years ago, it was impossible to dramatically increase photo size without losing quality. Your best option in Photoshop’s Bicubic Interpolation made the picture blurry. This is not true in case of Neural Networks and AI. The ML-powered application is trained on a huge dataset of pictures, so it can add extra details and pixels to photos, much better than traditional software.

5. Waifu2x

Waifu2x is an open-source image upscaling software that uses convolutional neural networks (CNNs) to increase the resolution of digital images.

6. AI Image Upscaler

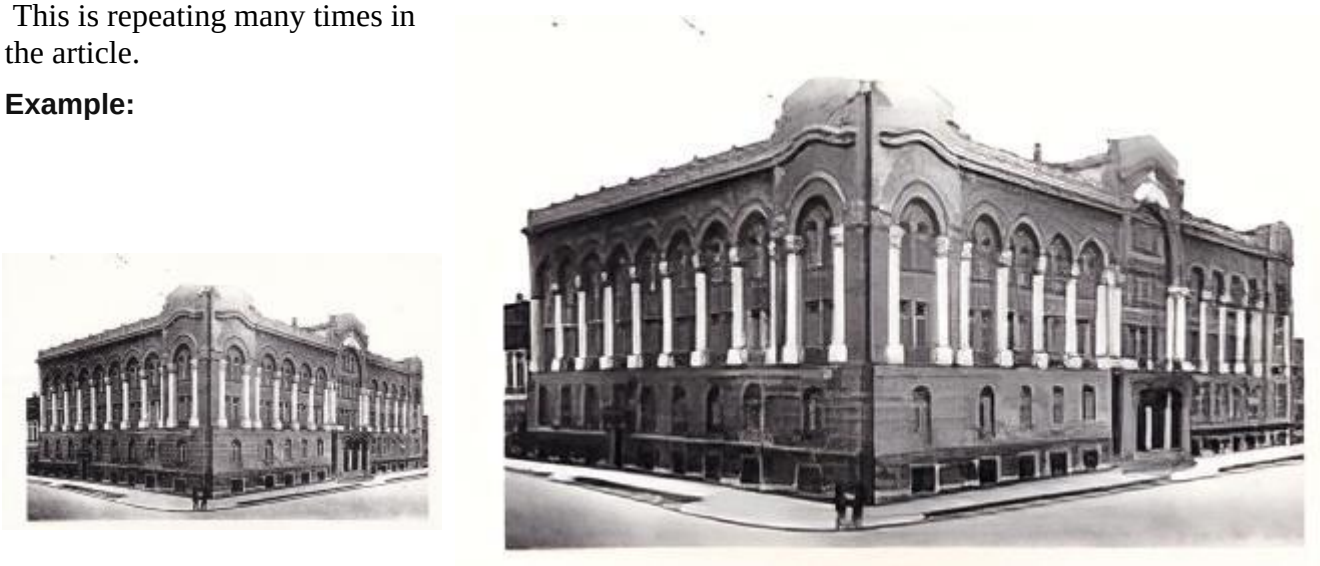
In this paper we will elaborate more on the free online program called AI Image Upscaler.

There are many free solutions like AI Image Upscaler for upscaling and enhancing images. AI Image Upscaler claims to use advanced computer vision algorithms to

increase the resolution of images up to 4x while maintaining the details and textures of the original image.

This is repeating many times in the article.

Example:



Picture : Scanned image of Banski dvor in Banjaluka increased x2 (Arhiv Republike Srpske, ARSBL 0205–0202)

AI image upscaling software uses advanced algorithms and machine learning techniques to increase the resolution and quality of digital images. By analyzing the patterns and features of low-resolution images, these algorithms are able to generate new, higher-resolution versions of the images. The result is an image that is clearer, more detailed, and easier to interpret.

In conclusion, AI image upscaling software can be a valuable tool for archives looking to improve the visual quality of their digitized collections. By enhancing the resolution and quality of historical materials, archives can increase their accessibility, protect fragile originals, and provide researchers with new insights and discoveries. However, it is important to use these techniques responsibly and ethically, with proper attention paid to issues of preservation, copyright, and privacy.

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POVZETEK

UPORABA ORODJA AI IMAGE UPSCALER V ARHIVIH

Saša ĐUKIĆ
Arhiv Republike Srpske, Banja Luka, Bosna in Hercegovina
djusasa@gmail.com

Povečevanje slik z umetno inteligenco v arhivih se nanaša na uporabo algoritmov umetne inteligence za izboljšanje ločljivosti ali velikosti slik, shranjenih v arhivu. To je uporabno v primerih, ko je izvirna fotografija v zelo nizki resoluciji in jo je potrebno za ogled ali analizo povečati in izboljšati. V kontekstu arhivov lahko izboljšavo slik s pomočjo umetne inteligence uporabljamo za izboljšanje vizualne kvalitete zgodovinskih slik, dokumentov in drugega gradiva, ki ga je načel čas. Na primer, arhivi hranijo fotografije, ki so zbledele, postale zamegljene ali so poškodovane. Z uporabo tehnik umetne inteligence lahko takšne fotografije restavriramo do njihove izvorne kvalitete ali le-to celo še izboljšamo.

Eden od priljubljenih pristopov k povečevanju slik z umetno inteligenco je uporaba algoritmov globokega učenja, ki se učijo na velikih naborih podatkov visoke kakovosti. Ti algoritmi lahko prepoznajo vzorce v slikah z nizko ločljivostjo ali nizko kakovostjo ter na podlagi teh vzorcev ustvarijo nove slike višje kakovosti. Obstaja več komercialno dostopnih orodij za povečevanje slik z umetno inteligenco, ki uporabljajo te vrste algoritmov globokega učenja in jih lahko uporabljajo arhivarji in drugi strokovnjaki za izboljšanje kakovosti arhiviranih slik.

Nekateri priljubljeni pristopi povečevanja slik z umetno inteligenco vključujejo generativne protislovne mreže za superločljivost (SR-GAN) in globoke konvolucijske

nevronske mreže (DCNN). Pomembno je opozoriti, da lahko povečevanje slik z umetno inteligenco v nekaterih primerih povzroči nastanek artefaktov ali izgubo podrobnosti. Obstaja več programov za povečevanje slik z umetno inteligenco, ki izboljšujejo kakovost digitalnih slik.

Nekateri najbolj priljubljeni in široko uporabljeni programi za povečevanje slik z umetno inteligenco so:

- Topaz Labs Gigapixel AI,
- Adobe Photoshop,
- Let's Enhance,
- Waifu2x,
- Image Upscaler.