

Colourizing B&W Images AI

The goal of this project is to convert black and white images into colored pictures. This AI could be used to add color to old pictures when at that time the option for color was not available in photography.

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Technology Impact Cycle Tool

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Impact on society

What impact is expected from your technology?

What is exactly the problem? Is it really a problem? Are you sure?

Turning old B&W photos from before 1960 into colored photos.

Are you sure that this technology is solving the RIGHT problem?

This technology is not perfect, but it can predict very accurate respirations of how the picture would like in colour.

How is this technology going to solve the problem?

It converts B&W picture into colored image using a neural network to predict its colours.

What negative effects do you expect from this technology?

It could predict the wrong colour of the skin with certain ethnic groups.

In what way is this technology contributing to a world you want to live in?

The AI could shine new light on old images and make historical photography and filmmaking more interesting and appealing.

Now that you have thought hard about the impact of this technology on society (by filling out the questions above), what improvements would you like to make to the technology? List them below.

Make a diverse training/test set, so that the AI can predict acutely without offending anyone.

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Hateful and criminal actors

What can bad actors do with your technology?

In which way can the technology be used to break the law or avoid the consequences of breaking the law?

It could be used to colour Nazipropaganda and hateful imagery/film.

Can fakers, thieves or scammers abuse the technology?

Yes, it could be used disrespectfully, for example, it could colour certain uniforms of soldiers differently.

Can the technology be used against certain (ethnic) groups or (social) classes?

Yes/No if the network is not trained well enough with lots of variances it might color in certain ethnic wrongly.

In which way can bad actors use this technology to pit certain groups against each other? These groups can be, but are not constrained to, ethnic, social, political or religious groups.

Most of the images in black and white were from a time where there was lots of racism, sexism, and Ageism. so it is possible to use some of that data against ethnic, social, political or religious groups.

How could bad actors use this technology to subvert or attack the truth?

If the AI miss predicts the colour of some imported events and spread false information.

Now that you have thought hard about how bad actors can impact this technology, what improvements would you like to make? List them below.

not a lot, but perhaps training the AI and testing it correctly will lead to less misuse of my technology.

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Privacy

Are you considering the privacy & personal data of the users of your technology?

Does the technology register personal data? If yes, what personal data?

No the data I use is publicly available.

Do you think the technology invades the privacy of the stakeholders? If yes, in what way?

Yes if you would use private pictures.

Is the technology is compliant with prevailing privacy and data protection law? Can you indicate why?

Yes, this technology is only a tool it does not use private data to train itself. instead, it just converts input to the wanted output.

Does the technology mitigate privacy and data protection risks/ concerns (privacy by design)? Please indicate how.

No, it can be used locally and it does not save data.

In which way can you imagine a future impact of the collection of personal data?

In a positive way, I think it is important to make history more appealing and give it literally a new layer of paint. It is possible to misuse the AI for example (old racist content) but I think that the impact is minimal.

Now that you have thought hard about privacy and data protection, what improvements would you like to make? List them below.

No, I never planned on saving data or using private figures to improve the AI.

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Human values

How does the technology affect your human values?

How is the identity of the (intended) users affected by the technology?

Yes, it can colour in the face of a user. So by definition, it affects the person's identity.

How does the technology influence the users' autonomy?

it potentially could change the colour of the skin, clothes and hair. but not specify autonomy.

What is the effect of the technology on the health and/or well-being of users?

It's positive if family members have old photos. they can see them in colour now.

Now that you have thought hard about the impact of your technology on human values, what improvements would you like to make to the technology? List them below.

Again having a well diverse training set is very important to prevent predictions that could be seen as insults.

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Stakeholders

Have you considered all stakeholders?

Who are the main users/targetgroups/stakeholders for this technology? Think about the intended context by answering these questions.

Name of the stakeholder

Musea that use B&W imagery

How is this stakeholder affected?

for example world war 1&2 musea, It provides the public that watches this imagery with more context and colour.

Did you consult the stakeholder?

No

Are you going to take this stakeholder into account?

Yes

Name of the stakeholder

Family members

How is this stakeholder affected?

Old portrait or family pictures from around 1960 are mostly black and white. The lack of colour is reflected on the person in that image, by added colour brings back more memory from that specific spot or moment that photograph was taken.

Did you consult the stakeholder?

No

Are you going to take this stakeholder into account?

Yes

Name of the stakeholder

Veteran soldiers/pilots/navy (from world war 2)

How is this stakeholder affected?

Most of the times before a big missions soldiers in ww2 would make a squad picture. For the Veterans, it could mean a lot to see their old team members in colour.

Did you consult the stakeholder?

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No

Are you going to take this stakeholder into account?

Yes

Did you consider all stakeholders, even the ones that might not be a user or target group, but still might be of interest?

Name of the stakeholder

Pascal Dauphin

How is this stakeholder affected?

He is my mentor

Did you consult the stakeholder?

Yes

Are you going to take this stakeholder into account?

Yes

Name of the stakeholder

Niek Schmitz

How is this stakeholder affected?

In charge of phase 2 (provisioning)

Did you consult the stakeholder?

Yes

Are you going to take this stakeholder into account?

Yes

Name of the stakeholder

Martijn Lamers

How is this stakeholder affected?

In charge of phase 3 (machine learning)

Did you consult the stakeholder?

Yes

Are you going to take this stakeholder into account?

Yes

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Name of the stakeholder

John Litseburg

How is this stakeholder affected?

Teacher for phase 1 (proposal document)

Did you consult the stakeholder?

Yes

Are you going to take this stakeholder into account?

Yes

Now that you have thought hard about all stakeholders, what improvements would you like to make? List them below.

No improvements, but I will keep them regularly informed on my progress.

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Data

Is data in your technology properly used?

Are you familiar with the fundamental shortcomings and pitfalls of data and do you take this sufficiently into account in the technology?

Yes, there might be some potential pitfalls with the datasets. For example the size of the picture, and the resolution.

How does the technology organize continuous improvement when it comes to the use of data?

There is no continuous improvement when it is trained and tested the network is ready for use.

How will the technology keep the insights that it identifies with data sustainable over time?

the target group I have is from the time frame 1838 until 1960. So there is no new data!

In what way do you consider the fact that data is collected from the users?

There is no data collected!

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them below.

For now, there are no improvements to be made.

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Inclusivity

Is your technology fair for everyone?

Will everyone have access to the technology?

Yes, everyone that has access to the internet can use the technology.

Does this technology have a built-in bias?

No, It can be used by everyone.

Does this technology make automatic decisions and how do you account for them?

Yes, it is a neural network so decision making on its own is what it does the most. But by having it trained correctly the technology should work accurately.

Is everyone benefitting from the technology or only a a small group?

Do you see this as a problem? Why/why not?

Mostly a small group that have old pictures, but people who want to try it out can also input B&W images and see what it does.

Does the team that creates the technology represent the diversity of our society?

No, I am creating this technology on my own. But I will be respectful towards the diversity of people in our society.

Now that you have thought hard about the inclusivity of the technology, what improvements would you like to make? List them below.

I am going to create a more diverse training set with people from lots of cultures. To prevent predicting the wrong colour of the skin, thereby hurting peoples feelings.

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Transparency

Are you transparent about how your technology works?

Is it explained to the users/stakeholders how the technology works and how the business model works?

I show the Jupyter notebook where the technology is described in much detail.

If the technology makes an (algorithmic) decision, is it explained to the users/stakeholders how the decision was reached?

It is difficult to explain a neural network if you have experience in AI, But by looking at Jupyter notebook and the description that is provided.

Is it possible to file a complaint or ask questions/get answers about this technology?

No

Is the technology (company) clear about possible negative consequences or shortcomings of the technology?

Yes a warning will be added

Now that you have thought hard about the transparency of this technology, what improvements would you like to make? List them below.

If the technology I made will be used in an application. transparency will be a much more important subject.

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Sustainability

Is your technology environmentally sustainable?

This category has not been filled yet.

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Future

Did you consider future impact?

What could possibly happen with this technology in the future?

It could be used to highly accurately predict the colour of old films and photos.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one utopian scenario.

people would be able to see all the historical event such as WW2 films and pictures in colour. thereby making it more fun and colourful to learn about history!

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one dystopian scenario.

People use this technology to wrongly predict the colour of uniforms, for example, they change the colours of soldiers to blame war crimes on other countries.

Would you like to live in one of this scenario's? Why? Why not?

I would rather live in the utopian scenario. because it would be fun to see if people like using my technology.

What happens if the technology (which you have thought of as ethically well-considered) is bought or taken over by another party?

They would use it to make it more accurate. Perhaps they create an app that's easy useable for people.

Impact Improvement: Now that you have thought hard about the future impact of the technology, what improvements would you like to make? List them below.

No changes for now. I think my task is to make sure that the output of my technology is as human as possible(It takes into account ethics).