Shelter Animals

A Machine Learning project aimed at predicting the duration animals will stay at a shelter based on various conditions.

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?

There are over 600 million stray animals around the world. A large amount end up in shelters which try to find an accommodating home. However, because there's so many animals a lot of them end up getting euthanised simply because there's not enough space.

There's very little insight in how long it will take a certain animal to find a new home.

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

It does not solve the problem of stray animals or the overflow of animals in shelters being euthanised. This is too big of a problem to take on. Instead we aim to get more insight to reduce the suffering.

How is this technology going to solve the problem?

Using the extra information shelters and governments can get a better view of the situation and balance the occupation better.

What negative effects do you expect from this technology?

Shelters can use it to euthanise animals that are harder to adopt while keeping the ones that are easies to adopt alive.

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

While stray animals aren't as big of a problem in the Netherlands, they're very common in most other places. The result is that a lot of them end up getting killed.

I would like this not to be a necessity. One important contribution for this would be to get more insight into shelter occupation.

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.

Rather than building the tools for shelters specifically it might be better to focus on governments as target groups. If the technology were successful it might be important to restrict its usage to no-kill shelters.

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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?
The law regarding animal euthanisation differs from country to country.

In most countries there is a customary waiting period. Some shelters already ignore this waiting period. If the knowledge is available that an animal is unlikely to be adopted that could be further encouragement to skip this waiting period.

Can fakers, thieves or scammers abuse the technology?
Shelters could lie the technology gave unfavourable results even when it didn't and use this as a reason for humane euthanisation.

Can the technology be used against certain (ethnic) groups or (social) classes?
If the data suggests that certain animal races get adopted faster than others the technology could work in or against their favor, causing them to either live or die.

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.
Euthanisation of stray animals is already a controversial topic. Some people believe it is for the best. Animals in overpopulated shelters that are unlikely to get out don't live a very good life. The technology could be used as an argument to put them down, causing people with different ethical standpoints to be put against one another.

How could bad actors use this technology to subvert or attack the truth?
Bad actors could use the technology to argue that the lives of certain strays are better off ended right away. The real issue is the amount of strays, which can be reduced in more humane methods such as neutering and by finding them a suitable home.

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

It needs to be very clear that the predicted value is an estimation and NOT a reason to end an animal's life. The technology should be used to predict the occupation of shelters rather than to pick and choose which animals should live and die.

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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?

The technology does not register personal data. The data that is registered is regarding animals which do not fall under the GDPR. Therefor privacy should not be an issue.

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

The technology currently does not involve the privacy of stakeholders.

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

Yes. The data that is used does not fall under the GDPR because it is about animals.

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

The technology specifically focuses on the public data of shelters.

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

If a shelter or region of shelters has a lot of data on its own this data could be used to train a new model and make more accurate predictions for that area.

This could include things such as which employees were present when the most animals got adopted and which personal traits played a role in this.

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

Keeping an open mind to training new model based on national or regional data so that shelters can make a more accurate prediction.

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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?
The technology can be perceived as stigmatising when it is taken out of context of its intended use case. While my inherit believe is that all animals are equal, the technology imposes the view that some are 'worse' than others.

How does the technology influence the users' autonomy?
The technology gives users more information which can either be used to make the world a better place or to worsen it.

What is the effect of the technology on the health and/or well-being of users?
Assuming the technology is used correctly it is beneficial in the managing of occupation in animal shelters. Getting a clearer image can reduce stress.

If used incorrectly the technology can have a very negative effect on someone's well being.

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.
Not using animal race at all would likely decrease the accuracy quite significantly, but is worth looking into.

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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
Animal Shelters

How is this stakeholder affected?
The animal shelters gain insight in which animals will get adopted quickly and which will take longer to find a home.

Using this knowledge they can make a better estimation of the occupation and if an animal would be better suited at a farm.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Governments

How is this stakeholder affected?
It's in governments best interest to minimise stray population. Animal shelters play a big role in this.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Animals

How is this stakeholder affected?
The animals are the ones whose life is being decided over. Although they don't have any say in the matter, there's a potential scenario where the tool could be used to make decisions over their lives.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Teachers

How is this stakeholder affected?
The teachers will be judging this project based on my progress and grade it accordingly.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Developer

How is this stakeholder affected?
My work will be grades based on my performance

Did you consult the stakeholder?
Yes

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
Puppy Mills

How is this stakeholder affected?
They benefit from a reduction of animal in shelters because their sales will increase.

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.
The technology should be monitored by governments, making them the stakeholder instead of shelters. Shelters are the end-users.

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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?
There won't be an equal distribution of animal colors, races, types, states etc.

There will be factors that aren't taken into account in the data, such as the personele and employees. There's also a human factor when it comes to adopting, meaning there will be a large factor of randomness.

How does the technology organize continuous improvement when it comes to the use of data?
The first iteration does not organize continuous improvement automatically. However the pipeline will be set up so that the model can be rebuild using new and more up-to-date data manually.

Later on we might utilise an API which will allow shelters to upload their regional or national data and have it create a custom model for them.

How will the technology keep the insights that it identifies with data sustainable over time?
The data will stay relevant for a while, but might get slightly outdated in a decennia. New trends happen and people's preference might change from tabby cats to grey cats.

By constantly collecting adoption data a new model could be build every few years. Constantly rebuilding it or using a continuous improving model won't benefit the problem much because the situation won't change very quickly.

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

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them below.
There should be a pipeline that rebuilds the model based on new data.

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Inclusivity

Is your technology fair for everyone?

Will everyone have access to the technology?
No. Only shelters should have access to this technology. This might be narrowed down to a subset of shelters; the no-kill shelters specifically.

Does this technology have a built-in bias?
The data collected was only from a certain American shelter in Austin, which is a no-kill shelter. Because of the adoptions are all from this region. People in other regions might have different preferences, meaning the data won't be as accurate.

Does this technology make automatic decisions and how do you account for them?
The technology does not make automatic decisions. It only predicts how long it thinks it will take for a certain animal to get adopted.

Is everyone benefitting from the technology or only a a small group? Do you see this as a problem? Why/why not?
In an ideal scenario only (certain) shelters would be benefiting from this technology. This could function as an encouragement for kill-shelters to switch over in order to get access.

Does the team that creates the technology represent the diversity of our society?
I'll be working on this project by myself. As an individual it's impossible to represent the diversity of our society, but I can do my best to take it into account.

I know other people have the optics that kill-shelters are an okay solution and that killing off strays is better than them living the lives they currently do. I understand this viewpoint and agree with it to a certain degree, but don't think it's a long term solution.

Now that you have thought hard about the inclusivity of the technology, what improvements would you like to make? List them below.
I would like to expand the project by making use of data from other shelters to see how different of an outcome this leads to.

I'm also curious how well the model will do on the data of other shelters as opposed to a testing subset from the initial data.

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?

The stakeholders will be told that the technology makes an estimation of how long it takes for an animal to get adopted. Because of randomness factors this does not have to be a proper representation of reality. It's very important that this is clear.

We don't go into technical details of the model.

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

The technology can be used to estimate the occupation of a shelter by combining the intake rates of a certain time period with adoption rates of the animals that are currently staying there.

The stakeholders are given this knowledge and the estimated numbers will be available to them.

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

I'm developing this project by myself. The people that have questions or see a downside are likely to be teachers who can contact me about them in numerous ways; in class, my email or in MsTeams.

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

Yes, I want to be very up front about the possible negative consequences, which mostly consists of bad actors misusing the technology for something besides its intended use.

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

Part of the deployment could be creating a page that explains how the model was set up, what it's limitations are and what users should expect from it.

Sustainability
Is your technology environmentally sustainable?

In what way is the direct and indirect energy use of this technology taken into account?
The deployed model will require both a front- and back-end server. Because it's going to be on a very small scale the energy usage should be minimal. Rather than running it on my local computer I can make use of a dedicated server.

Do you think alternative materials could have been considered in the technology?
N/A

Do you think the lifespan of the technology is realistic?
Yes. While the accuracy might alter over time as people's preference changes the overall result won't change drastically. If the model is updated every 5 years there shouldn't be any issues whatsoever.

What is the hidden impact of the technology in the whole chain?
Animal shelters have a better idea of their occupation. This allows them to communicate better and notify other shelters if they won't be able to take in faraway animals or need other shelters to take some in. They can also balance their employees based on seasonal demand.

If governments see a consistent shortage they can decide to open new shelters and/or manage the animal population differently.

Now that you have thought hard about the sustainability of this technology, what improvements would you like to make? List them below.
I would like to deploy the model on a dedicated server. Preferably this would be a Fontys server as to prevent paying a monthly fee.

Future
Did you consider future impact?

What could possibly happen with this technology in the future?
Hard to adopt animals could be automatically promoted more on social media using an AI that puts together videos. The required employees and their schedules could be created based on the necessity.

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.
There's not many stray animals that are picked up anymore. We know how long it'll take for the ones that end up in shelters to get adopted. If cats are harder to adopt they are promoted more to help them find a forever home. Particularly wild cats are brought to farms instead.

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.
The stray animal population is out of control. Rather then neutering them and returning them to the wild we've chosen to cull as many as possible. Only quick to adopt animals are kept in shelters, whereas others are killed on the spot.

Would you like to live in one of this scenario's? Why? Why not?
Yes, the utopian would reduce the overall suffering which is I ethically think we should strive towards.

What happens if the technology (which you have thought of as ethically well-considered) is bought or taken over by another party?
It could be used for a dystopian purpose.

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.
The way the technology is used is extremely important and needs to be thoroughly monotized.