Multi-modal prediction of adoptability of pets

Anunay Yadav
anunay18021@iiitd.ac.in
2018021

Ansh Kumar Sharma
ansh18130@iiitd.ac.in
2018130

Rahul Kukreja
rahul18254@iiitd.ac.in
2018254

1. Motivation

Millions of stray animals suffer on the streets or are euthanized in shelters every day around the world. If homes can be found for them, many precious lives can be saved — and more happy families created. When we try to analyze trends in pet adoption, we may find some interesting conclusion which could help shelters have better pet profiles to increase pet adoption rate. Following this thought process, our team decided to delve further into this topic, and we found petfinder:adopatability prediction challenge on Kaggle [4] having variety of text, image and csv data. This project completely aligns with our vision of an ideal project, i.e. solving a real world problem with extensive data analysis and combining multi modal data to perform machine learning tasks.We are hoping to examine the results to develop strategies to help improve the overall adoption rate (i.e. what features lead to faster adoption).

2. Related Work

1. The paper uses data-driven approach to identify dog characteristics that contribute to adoption, the results of which can be used in subsequent theory building on owner-dog attraction. [1]
2. This study was used to investigate how different characteristics in dogs' photos presented online affected the speed of their adoptions. [2]
3. This provides a comprehensive survey of multi-modal machine learning and data analysis techniques. [3]

3. Timeline

1. Pre-processing text data(text embedding). [1 week]
2. Pre-processing image data and extracting features [1 week]
3. Multi-modal feature fusion (combining text and image data). [2 weeks]
4. Performing experiments and data analysis. [2 weeks]
5. Applying different models and metrics to draw conclusions from the accuracy achieved. [3 weeks]
6. Writing report and presentation to summarise the work we have done. [1 week]

4. Individual Tasks

1. Multi-modal feature fusion. - **Ansh**
2. Pre-processing of text data(Text embedding).-**Anunay**
3. Pre-processing of image(CNNs). - **Rahul**

All three of us will contribute equally towards performing experiments and analysing data and results.

5. Final outcome

Gaining insights into trends and biases society has when it comes to adopting pets and further using these to increase the adoption rate. We aim to perform many experiments on the data set with respect to feature extraction, analysis and trying different models to finally predict the adoptability of pets with high accuracy. We would further share the gained knowledge with pet adoption homes so that they could use it and take measure to improve the adoption of pets with them.

This project also has application in many different fields e.g. applying the same idea for job applications to understand trends, biases and expectations of hiring committees for a particular job profile, we can automate the process and improve overall hiring of the world.

6. References

[1] Deleeuw, Jamie. (2010). Animal Shelter Dogs: Factors Predicting Adoption versus Euthanasia. 10.13140/2.1.2375.0082.

[2] Lampe, Rachel & Witte, Thomas. (2014). Speed of Dog Adoption: Impact of Online Photo Traits. Journal of applied animal welfare science : JAAWS. 18. 1-12. 10.1080/10888705.2014.982796.

[3] Tadas Baltrušaitis, Chaitanya Ahuja, Louis-Philippe Morency: "Multimodal Machine Learning: A Survey and Taxonomy", 2017; [http://arxiv.org/abs/1705.09406 arXiv:1705.09406].

[4] PetFinder.my Adoption Prediction Challenge