# Machine Learning Model for Classification of Various Cat Breeds

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## 1 Abstract

In this project, we introduce a classifier for determining the breed of a cat based on a images. Compared to previous work this introduces detection based on features synthesized from multiple datasets. In particular, our synthesized dataset extracts breed from [1] and facial features from [2]. For photos not in [2], we perform image processing to segment the image and generate the point data for the corresponding facial features. These features are then preprocessed by obtaining the relative positions of each feature to one another. Additional features such as fur color, eye color, and pattern are added to our feature vector. This vector is then passed through the standard machine learning pipeline using the scikit-learn library. We make use of the RandomForestClassifier to obtain a prediction that is then used for validation. Results demonstrate a high degree of accuracy for our input dataset in addition random photos obtained via the internet.

## References

[1] Omkar M Parkhi et al. "Cats and dogs". In: *2012 IEEE Conference on Computer Vision and Pattern Recognition*. 2012, pp. 3498–3505. DOI: 10.1109/CVPR.2012.6248092.

[2] Weiwei Zhang, Jian Sun, and Xiaoou Tang. "Cat Head Detection - How to Effectively Exploit Shape and Texture Features". In: *Computer Vision – ECCV 2008*. Ed. by David Forsyth, Philip Torr, and Andrew Zisserman. Berlin, Heidelberg: Springer Berlin Heidelberg, 2008, pp. 802–816. ISBN: 978-3-540-88693-8.