**Research Project Proposal**

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**Machine learning in animal identification**

In current circumstance, although most of zoos have indicators for animals, yet sometimes we found that they look different from the signs. There are many wild zoos in the world, most of the time children are curious about different kinds of animals when it presents in their eyes. Children might frequently ask their parents what it is, but in most cases their parents don’t know either.

Our animal identifying functionality is designed to solve this problem. The purpose of our project is to help recognizing animals by applying machine learning technique into the real world. By giving sufficient datasets to train our model, we can accurately recognize various animals. Therefore, if someone use this functionality toward animals, he could further learn more knowledge about the target creature.

**Background research of related work**

In our project, we introduce useful deep learning library called Keras and Tensorflow. Keras is an user friendly high level neural network API, which runs on top of Tensorflow. Tensorflow is the most popular library used for training deep learning model. These two machine learning libraries are based on deep learning neural network, they have powerful performance on training model and reading datasets. Therefore, we decide to implement these two helpful tools into our project.

**Data sources**

Detailed and even some advanced data from these websites:

Animal Pictures: <https://www.pexels.com/search/animal/>

Franklin Park Zoo: http://www.zoonewengland.org/franklin-park-zoo

**What algorithms are being used and code sources**

In our project, we test some basic deep learning algorithms to see their performance based on our dataset. Algorithms include Linear Regression, Naive Bayes, Logistic Regression and Neural Network.

**Linear Regression**

Python Linear Regression Tutorial

<https://machinelearningmastery.com/simple-linear-regression-tutorial-for-machine-learning/>

**Logistic Regression**

Logistic Regression Tutorial for Machine Learning

<https://machinelearningmastery.com/logistic-regression-tutorial-for-machine-learning/>

**Neural Network**

neural network beginner tutorial in python

<https://www.kdnuggets.com/2016/10/beginners-guide-neural-networks-python-scikit-learn.html>

**References**

Keras: The Python Deep Learning Library

https://keras.io/

Get Started with Graph Excution

https://www.tensorflow.org/get\_started/get\_started\_for\_beginnersAakash Nain(2017). TensorFlow or Keras? Which one should I learn?

https://medium.com/implodinggradients/tensorflow-or-keras-which-one-should-i-learn-5dd7fa3f9ca0

Ankit Sachan. Keras tutorial: Practical guide from getting started to developing complex deep neural network.

http://cv-tricks.com/tensorflow-tutorial/keras/

Pedregosa, Fabian, et al. “Scikit-Learn: Machine Learning in Python.” Edited by Mikio Braun, Journal of Machine Learning Research, 2011. [www.jmlr.org/papers/v12/pedregosa11a.html](http://www.jmlr.org/papers/v12/pedregosa11a.html).