**Artificial Intelligence**

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**Project Supervisor**

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**Project Title**

# Image Classification

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**Description:**

Problem Statement:

For the computer, an image in RGB notation is the summary of three different matrices. For each pixel of the image, it describes what color that pixel displays. We do this by defining the red component in the first matrix, the green component in the second, and then the blue component in the last. So, for an image with the size 3 on 3 pixels, we get three different 3x3 matrices. The challenge is exacerbated when we want to process larger images with more pixels and more color channels. Such a network with a huge number of parameters will most likely run into overfitting. This means that the model will give good predictions for the training set. If we want to classify an image, e.g., whether there is a dog in it or not, these details, such as the nose or the ears, can be the decisive factor for the correct result. Artificial Intelligence and **Machine Learning** is now one of the hottest topics around the world. Well, it can even be said of the new electricity in today’s world. But to be precise what is Machine Learning, well it’s just one way of teaching the machine by feeding a large amount of data.

Model Used:

Convolutional Neural Network takes a different approach, mimicking the way we perceive our environment with our eyes. So basically, what is CNN – as we know it’s a machine learning algorithm for machines to understand the features of the image with foresight and remember the features to guess whether the name of the new image is fed to the machine. For the dataset we will use the Kaggle dataset of cat-vs-dog. In TensorFlow we can now build the Convolutional Neural Network by defining the sequence of each layer. Now after getting the data set, we need to preprocess the data a bit and provide labels to each of the images given there during training the data set. To do so we can see that name of each image of the training data set is either start with “cat” or “dog” so we will use that to our advantage then we use one hot encoder for the machine to understand the labels (cat [1, 0] or dog[0, 1]).

Business Need:

When we want to process larger images with more pixels and more color channels. Such a network with a huge number of parameters will most likely run into overfitting. This means that the model will give good predictions for the training set.