

**School of Information Technologies**

Faculty of Engineering & IT

**ASSIGNMENT/PROJECT COVERSHEET - GROUP ASSESSMENT**

**Unit of Study: COMP5318**

**Assignment name: Machine Learning Assignment 2 – CIFAR-10-ImageClassifier**

**Tutorial time: 20:00 Monday Tutor name: Kelvin Hsu, Anthony Tompkins**

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# Abstract

Image recognition is carried out on the actual image transformation to achieve the aim of identification. Because of the characteristic of the image information is that it is a two-dimensional space, so the amount of information it contains is very large. Before the image recognition it is required to image pre-processing techniques for feature extraction and feature optimisation. Neural network image recognition using Keras library is latest way of image recognition, this report presents details of various Neural network image recognition and comparison with other techniques available.

* Sift/Daisy Features & SVM
* Convolution Neural Network
* Recurrent Neural Networks - LSTM & GRU
* Residual Neural Network - ResNet using Keras

# Introductions

The CIFAR-10 dataset in question consists of 60000 32x32 colour images in 10 classes, with 6000 images per class. There are 50000 training images and 10000 test images. Problem is to predict test images based on training images with maximum accuracy, precision. Overall the image recognition is closely related to social life, image recognition is an important branch of computer vision, and neural network image recognition is along with the modern computer technology.

In this report, various neural network techniques are used to analyze the acquired digital image recognition. Image recognition involves a lot of information operation, requiring high processing speed and recognition precision, real-time and fault-tolerance of the neural network in accordance with the requirements of image recognition. Validated through the experiment, proved the feasibility and effectiveness of the optimization method, and realized by programming, achieve better results.

● What is the problem you intend to solve?

● Why is this problem important?

# Methods

## Sift/Daisy Features & SVM

## Convolutional Neural Network - CNN

## Residual Neural Network - ResNet

## Recurrent Neural Network – LSTM & GRU

* Previous relevant methods used in literature
* Theory on different techniques compared
* Pre-processing
* Design choices

# Experiments & Discussions

## Sift/Daisy Features & SVM

## Convolutional Neural Network - CNN

## Residual Neural Network - ResNet

## Recurrent Neural Network – LSTM & GRU

< Try to include following>

* Experiments, comparisons and evaluation
* Meaningful discussion of results and design choices
* Relevant personal refection

# Conclusions and future work

# References

Following are website/documents referred for this assignment.

# Appendix

NA