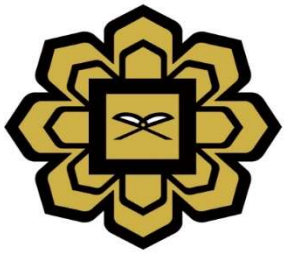

الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يونيورسيتي إسلام انتارابغسا ملايسيا

KULLIYYAH OF INFORMATION & COMMUNICATION TECHNOLOGY

CSC 3304 MACHINE LEARNING

SECTION 01

Group 2 Project Proposal

Title:

Human Activity Recognition using LSTM

PREPARED BY:

AHMAD (1526703)

MAHFUZEALAHI NOMAN (1515803)

ABID ENBA SAIF UTSHA (1433527)

SHEIKH MD HANIF HOSSAIN (1534721)

JIHAD ROBA JOBO (1614857)

LECTURER

DR. AMELIA RITAHANI BT. ISMAIL

DUE

6th March 2019

1.0 Introduction

1.1 Background of study

Sequence prediction challenges have a been around us for quite awhile and are considered by some, as one of the hardest problems to deal with in the data science field. This is where Long Short-Term Memory (LSTM) networks come into the picture, as it has the potential of providing an effective solution. An LSTM is an improved version of RNN as it is capable of learning long-term dependencies. It is usually considered to be more complex but easier to train due to its ability to avoid the vanishing gradient problem.[1]

The concept of LSTM networks was introduced by Hochreiter and Schmidhuber in 1997, and was further refined by many people that work in this related field. Due to its capability of working with various types of problems, it is widely used by many industries and organizations.

Our study will be focused on Human Activity Recognition (HAR) using a smartphones dataset and an LSTM RNN.[2] This research has been conducted by Guillaume Chevalier (2016) and is available in his GitHub repository.

1.2 Problem Background

Human Activity Recognition is a broad area which focuses on Identifying specific human movements or actions based on sensor data. Movements would be typical activities like walking, sitting, laying on a bed. The sensor data can be collected in many ways like videos, radar etc.

The purpose of this project is to identify human behaviour using smartphone dataset. The smartphone is attached to the wrist and based on accelerometer and gyroscopes It will help to recognize the type of activity that the user is doing, for example - walking in a lobby or laying on a bed.

The problem or challenge is to predict the activity with the small number of sensor data. Generally, this problem is called as univariate or multivariate time series classification task. This type of issue can easily be solved using deep learning. In this project, we are going to implement Recurrent Neural Network with LSTM(Long-Short Term Memory).

---

[1] Srivastava, P. (2017, December 23). Essentials of Deep Learning : Introduction to Long Short Term Memory. Retrieved from https://www.analyticsvidhya.com/blog/2017/12/fundamentals-of-deep-learning-introduction-to-lstm/

[2] Guillaume Chevalier, LSTMs for Human Activity Recognition, 2016, https://github.com/guillaume-chevalier/LSTM-Human-Activity-Recognition

1.3 Objectives

- Identify human activity which includes walking, walking upstairs, walking downstairs, sitting, standing, laying.
- In-depth learning of Recurrent Neural Networks with LSTM
- Implement LSTM using TensorFlow

1.4 Expected Outcome

By giving the images of human activity as input, the model should be able to recognize what kind of activity is being done such as walking, going down, going up. The model also should have good prediction accuracy of higher than 60%.

2.0 Dataset

We will be using UCI machine learning archive dataset to train and test our model.

Source of this dataset:

https://archive.ics.uci.edu/ml/machine-learning-databases/00240/UCI%20HAR%20Dataset.zip