

23rd June, 2018

Raghav Prasad BITS Pilani - Goa Campus

Dear Raghav Prasad,

Subject: Letter of Evaluation

This is with reference to the Global Academic Internship Programme (GAIP) conducted by Corporate Gurukul from 2nd June, 2018 to 23nd June, 2018 on 'Big Data Analytics using Artificial Neural Networks'. The course work for internship included the following:

Programming Methodology with Python

- Overview of Python and Its Syntax
- Variables, Operators and Arithmetic Expressions
- Basic Data Structures
- Basic Input and Output
- Conditional Control Flow
- Iterative Control Flow

Introduction to Python Data Science Libraries

- Numpy
- Scipy
- Matplotlib
- Sci-kit Learn

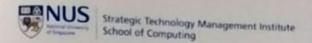
Introduction to Data Analytics

- What is Descriptive Analytics?
- **Exploratory Data Analysis**
 - Data Visualisation
 - **Descriptive Statistical Measures**
 - o Populations and Samples
 - Measures of Location
 - Measures of Dispersion

 - Measures of Shape
 Measures of Association
 - Overview of Predictive Analytics

Introduction to Regression Analysis

- · Simple Linear Regression
- Multiple Linear Regression
- Stepwise Regression
 Coding Scheme for Categorical Variables
- · Problems with Linear Regression



Introduction to Classification

- · Decision Trees
- Bayesian Classifier
- Logistic Regression
- Support Vector Machine
 - Separating Hyperplane
 - Maximal Margin Classifier
 - Support Vector Classifier
- Resampling Methods

Introduction to Clustering

- · Affinity Measures and Partition Methods
- K-means
- K-medoids
- Hierarchical Methods

Introduction to Association

- · Structure and Representation of Association Rules
- · Strong Association Rules and the Concept of Frequent Itemset
- Apriori Algorithm
- · FP Growth
- Time Series Analysis

Overview of ANN

- · Why ANN?
- · Break-through Applications with ANN
- · Problems of Logistic Regression

Multi-layer Perceptron Model (MLP)

- · Training MLP in Python
 - With Keras
 - On Amazon/Google GPU cloud platform

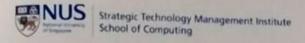
Gradient Descent Algorithm (GD)

Advanced GD algorithm

- · Stochastic GD (SGD)
- Mini-batch SGD
- Momentum SGD
- · RMSprop and Adam
- Application of Advanced GD and Training Techniques for MLP in Python

Difficulties of training ANN

- Poor Gradient
 Overfitting and Underfitting



Other Training Techniques of ANN

- · Random Initialization
- ReLU
- Dropout
- Data Augmentation

Convolutional Neural Networks (CNN)

- Convolution, Pooling Operations
- Popular CNN Architectures
- · Applications of CNN in Python

Recurrent Neural Networks (RNN)

- · Vanilla RNN
- · LSTM and GRU
- · Applications of RNN in Python

Your performance in GAIP was evaluated based on theoretical understanding and application of concepts in practical data analysis with GRADE A-.

I encourage you to further your knowledge, skills and research in the above areas and wish you the very best for a career ahead!

Sincerely

Dr. Tan Wee Kek

Strategic Technology Management Institute

School of Computing

National University of Singapore