



Sri Lanka Institute of Information Technology

Project Topic Assessment – 2017

Research Problem:

We live in the information age. As such often we can find a plethora of information about a given subject. So finding the exact bit of information we want can often be like finding a needle in a haystack. When the majority of the information is noise it can be a waste of time to sift through all the data and find what we need. However given modern technology we believe that is possible to leverage the technologies of Artificial Intelligence and Deep Learning to overcome this situation. If we are able to training an Artificial Agent to learn from a given set of data, we can simply ask questions from it and get the information we need directly. This would save an immense amount of time and give people the ability to get accurate information about a particular domain very easily.

Research Area:

The main identified research areas in this project will be as follows:

Neural Networks

- o Deep Neural Networks with many hidden layers
- o Implement with separate Activation functions

Feature Extraction / Text Summarisation

Context Understanding

- o Natural Language Understanding
- o Text Vectorisation

Artificial Information Seeking agents

- o System must be able to learn on it's own
- o Expand corpus intelligently

Solution proposed:

The system that we will be building is an Adaptive Artificial Intelligent System. The idea behind the project is to build a platform that is able to intelligently learn from a given corpus and be able to answer logical questions such as "What is the reason behind this issue?", "Why is this happening?". This is in contrast to direct, informative questions such as "When did this happen?" or "Who is this person?".

Example:

Q; What can go faster a man or a car?

A: A car would go faster because the average speed of a car is approximately 100KM/h and a person's average speed is 27KM/h.

To perform this type of logical processing we would first need to understand the context of the question. The system must understand that the user is trying to compare the speed between two distinct objects. Then the system must find the speeds between the two objects and find which one is faster. Finally, the output must be formatted in the form of a proper answer to the question.

Technologies to be used:

The technologies that we have identified so far are as follows:

Tensorflow

This is a Python library that would help us to implement parts of the Neural Network. Tensorflow allows us to carry out numerical operations using data flow graphs. In a Neural Network data flows from one neuron to another and each neuron will do some mathematical processing

NumPy

This is a popular framework for scientific computing. It provides linear algebra functions and a N-dimensional array object that is useful when carrying out operations on vectors.

Python Web Framework

Since the platform will be made available via a REST API we will need a Python web framework such as CherryPy to handle the HTTP requests.