# Experiment 1

## Specific Topic;

Does utilising Edge Computing reduce the computational load on the Client Device?

## Setup;

* Run the voice recognition application on the Client Device
* Save a voice recording using the Client Application
* Deploy the Voice Recognition Service to the Edge Device
* Publish the Data Centre WebAPI

## Isolate Variables;

Constants:

* Internet speed
* The voice recording
* The software package being used
* The Language Model and Dictionary being used for the processing
* The CPU usage from applications that aren’t the voice recording

Variables

* Where the voice processing is occurring

The variable in this experiment is whether I process the file locally on the Client Device, remotely pre-process it on the Edge Device or remotely process it on the Data Centre.

## Method; (plan the data collection)

Measurements recorded will be:

* CPU load in a percentage of the total CPU
* Processing time in seconds
* File size
* Size of the voice model being used
* Length of voice recording

After the Voice Recognition applications have been deployed 10 warmup requests will be performed on Client Device, a further 10 will be performed on the Edge Node and a final 10 on the Data Centre.

The measure of time will be recorded on the Client Device from as soon as the request starts to when the request finishes. The experiment will be repeated 10 times and an average will be taken.

The experiment will consist of a voice being recorded. The same recording will be used throughout the experiment to allow for a fair comparison of computational load.

## Hypothesis;

The hypothesis is that the Data Centre should process the request the fastest as it has the most powerful CPU but the CPU strain on the Client Device should be reduced regardless of the request being pre-processed on the Edge Device or the Data Centre.

## Analyse;

## Conclusion;

# Experiment 2

## Specific Topic;

Does utilising Edge Computing increase the latency of the request for the Client Device?

The rest of the information below will be the same apart from the parts I have filled in

## Setup;

## Isolate Variables;

## Method;

## Hypothesis;

The latency of the request should not increase much if the request is pre-processed on the Edge Device as both devices are Raspberry Pi’s however the request should be processed much quicker on the Data Centre as it has a faster processor.

## Analyse;

This will be unique

## Conclusion;

This will also be unique

# Experiment 3

## Specific Topic;

Load Balancing. Do the benefits of utilising Edge Computing deteriorate when multiple requests are made concurrently? Can this be improved with a custom load balancing aspect?

## Setup;

* Run the Stress Testing application on the Client Device
* Deploy the Voice Recognition service to the Edge Device
* Publish the Data Centre WebAPI

## Isolate Variables;

Constants;

* Number of requests
* The Voice Recording
* The software package being used
* The Language Model and Dictionary being used for Processing
* The CPU use from other applications

Variables;

* Whether the deployed Edge Node service is utilising custom Load Balancing

## Method;

Record CPU use and Time to finish request over a set number of request

Perform a set number of requests and record the CPU use.

Perform the same number of requests but with the Load Balancing application deployed

## Hypothesis;

Adding load balancing will improve response times

## Analyse;

## Conclusion;