**PART2A - Structured Abstract (Word Count: 242)**

**Context**

Smart phones can record motion sensor data. For example, accelerometer and gyroscope, linear acceleration and angular velocity.

**Objective**

The purpose of the project is to determine whether smartphone activity data can be used to infer individual characteristics about weight, height, gender, age, and if so, to what degree of accuracy.

**Method**

Time-series data was generated by an experiment conducted at Queen Mary University of London. An iPhone 6 was used by 24 participants to perform 6 activities in 15 trials, of varying length.

Linear and non-linear, deep and machine learning models were evaluated. These were Multi Layer Perceptron, Support Vector Machine Linear, Support Vector Machine - Radial Basis Function (RBF), Logistic Regression (L1), Logistic Regression (L2), Decision tree, Random Forest, K- Nearest Neighbour.

**Results**

Even when the limitations of the small dataset are considered, it is reasonable to conclude that personal characteristics of weight, height, age and gender can be predicted to a high degree of accuracy when using machine learning models to evaluate human activity sensor data.

Performance of the models varied significantly with the Random Forest Classifier having the highest accuracy. Models ranged in performance of predicting gender 70% to 97%, height 62% to 96%, age 63% to 94% and weight from 61% to 96% accuracy.

**Novelty**

This work supplements previous publications in the field by increasing the number of individual characteristics being predicted, extending the number of classification machine learning models utilised and how extensively evaluating their performance.

**PART 2B**

**Key Images**