# Affective Computing
# Project 2

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**1.** My selection was Random Forests. Given their reputation for reliability and high accuracy, Random Forests are a solid option for classification issues involving intricate and noisy data. In addition, the Random Forest ensemble approach aggregates the forecasts from several trees to produce a single forecast. This may increase the model's forecasts' precision and dependability.

**2.** In all datatypes, the maximum accuracy was discovered. The second-best accuracy for systolic blood pressure was discovered. We obtain the maximum accuracy across all datatypes because we fuse all the datatypes together. Given its correlation with discomfort, systolic blood pressure might have been the data type with the next best accuracy. Due to nerve system reflexes, when someone is uncomfortable, their blood pressure increases. By doing this, a strong correlation is created between the datatype and the class label. Consequently, we have the next best accuracy for the systolic BP datatype collected.

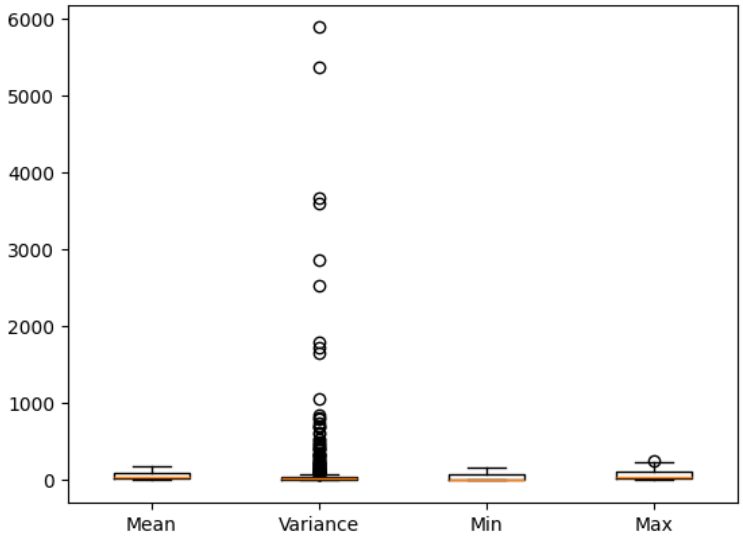
**3.** Fusing data has given the highest accuracy of all the datatypes. This practice can be beneficial for several reasons.

**a.** Knowledge Gained: Rather than focusing on a single feature, more information about all of them can be acquired by merging the datatypes. Consequently, the model might be trained on a wider range of scenarios than it would if it was trained solely on one data source.

**b.** Better generalization: By integrating all the datatypes, a model with greater generalization can be produced. It also works better when applied to non-visible data since the produced model may be more representative of the underlying data.

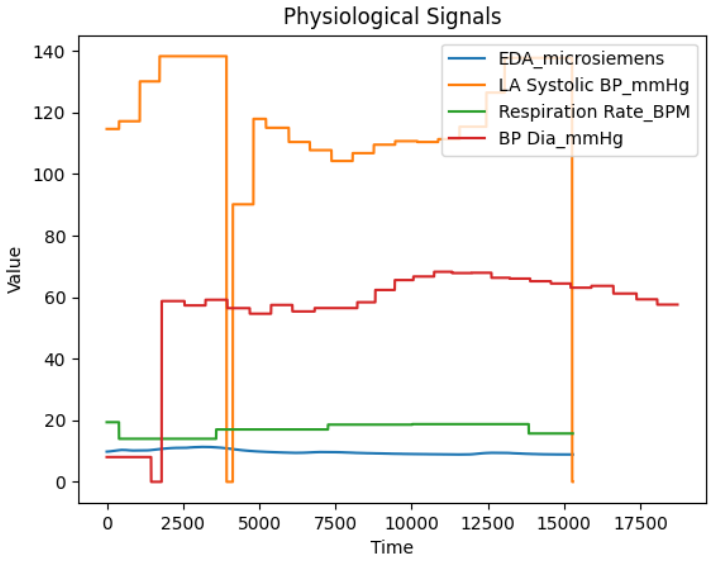
**c.** Reduced overfitting: As a result of better generalisation, the model shows reduced overfitting. If the machine is limited to using a certain set of datatypes, it could become overfit. Combining data increases the size of the dataset and lowers the chance that the model may overfit.

**4.**




As we can see from the above, variance exhibits a great deal of fluctuation and has a higher number of outliers. This is because there is a wide range of variance values in the dataset, which could be caused by a combination of high and low variance data, a high number of outliers, or a significant measurement error.

**5.**




This is plotted against F015 Pain for all datatypes.

When compared to other physiological signals, the EDA is typically found to be more variable.

This is because the sympathetic nervous system, which controls the body's "fight or flight" response, is very sensitive to fluctuations in EDA. Any kind of cognitive or emotional excitement has the potential to alter the sympathetic nervous system, which in turn may alter EDA.
As a result, EDA frequently varies greatly over time and between people.

**6.** Facial expressions and physiological signals are correlated during strong emotions like pain.
Kenneth M. Prkachin and Patricia E. Solomon are conducting a study to assess the validity, reliability, and structure of pain as reported by patients suffering from shoulder pain. Certain facial movements, like lowering the brow or closing the eyes, were found to be suggestive of pain when the facial behaviours were quantified using a coding system. These were also shown to be genuine, suggesting that people experience pain differently on an individual basis. However, this research may have drawbacks, such as the inability to fake pain emotions.

Reference:
Prkachin KM; Solomon PE The structure, reliability and validity of pain expression: evidence from patients with shoulder pain. 2008; 139(2):267-274 (ISSN: 1872-6623)