

Introduction of the subject field

Statistics Netherlands (CBS) has the wish to see if their respondents are moving for at least 150 minutes per week in moderately intense physical activity.

Currently, they are measuring by asking their respondent or health surveys. The issue with this is that people are not very good at estimating the time they spent on moving and sport. This of course causes that they don't have very reliable data to work with. Therefor CBS has been looking into alternatives like the accelerometer in combination with machine learning to give better and more accurate results when measuring the intensity of certain activities. After doing extensive research CBS concluded that the ActivPal accelerometer would give the best results when looking into recognizing activities and the intensity of those activities, therefor CBS have chosen to do further research to find out how the combination of the ActivPal accelerometer in combination with machine learning can predict if respondents have done their moderate physical activity for 150 minutes per week.

Because of this the CBS started to collect lab tests and started to measure the movements of 41 correspondents in their regular workweek by using the Activepal Accelerator. The group of correspondents exist of the age 21 to 82 and varies between correspondents that are fit, and are not fit.

It's our job to analyse, structure and build machine learning algorithms based on the collected data to see if we can determine if people adhere to (inter)national norm for physical activities and if we could measure the intensity of movement (without the heart rate information). CBS have chosen to use machine learning because they did pre research with the current dataset and came to the conclusion that machine learning would be the best fit to come to certain conclusions.

To make sure that this project won't research the wrong subjects or goes out of scope. The project group and CBS have set a clear scope in which research will be done. The following topics will be researched.

- How can Machine Learning be used to predict the intensity of activities performed in a lab situation by a person, who is being monitored with Vyntus One and wearing ActivPal accelerometer?
- How can Machine Learning be used to predict the intensity of activities performed by a person wearing only the ActivPal accelerometer, based on the data gathered from Vyntus One and ActivPal accelerometer in the lab situation?
- How can Machine Learning be used to determine whether people did their 150 minutes of moderate activity in ActivPal accelerometer data of an entire week?