# Factors detecting occupancy in a room

Determining the occupancy of a person in a room has many advantages in terms of learning the natural habits of an employee in an office, or even a family member in a home. This information will be useful in establishing a reasoning behind why a person would not be in that room and use that knowledge to benefit the company or household in terms of financial saving. In this case study, we will be using the dataset given by UMONS (Université de Mons) which gives 6 different attributes ranging from room humidity to concentration of CO2.

The ultimate goal of the analysis is to predict occupancy and determine which factors play a major role in this scenario. The data will be pre-prepossessed and encoded to remove anomalies and fill in the missing data. Furthermore, we will use different techniques such as Nonlinear SVM, Random Forest, Neural Networks to

(1) predict room occupancy using the given variables,

(2) Evaluate the effectiveness and accuracy of the different techniques on this dataset

(3) Study the correlation of these factors with room occupancy and with themselves

(4) Find out which variables explain the Occupancy trends sufficiently? does light, CO2, humidity, temperature affect if someone is in the room or not, and how effective are those conditions?

This will help companies and individuals to formulate focused strategies to improve upon multiple factors like energy consumption and safety level.

Reference: <https://archive.ics.uci.edu/ml/datasets/Occupancy+Detection+>