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# Detection of occupancy profile based on carbon dioxide concentration pattern matching

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**Abstract**

Occupancy is one of major factors influencing indoor microclimate. The aim of this work was to determine the influence of this factor on indoor air quality (IAQ) on the basis of $CO_2$ concentration measurements and statistical analysis. We wanted to identify periods of time when IAQ was strongly affected by the occupancy described by the given profile. The proposed approach consisted of several stages. The $CO_2$ concentration was measured and recorded in the form of univariate time series. Then, the relationship between occupancy and internal structure of the time series was disclosed. There were distinguished segments based on sample periodogram. Each segment was associated with a particular occupancy profile. In order to detect how human factor represented by a given occupancy profile influences IAQ we proposed to use pattern matching. In this

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