Information Sheet

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Topic of our study: Optimal ventilation control for improving indoor air quality and analyze how different levels of air quality affect people's decision-making performance.

General description of the study: There is a simulated office room set up with lots of sensors at Metropolia University of applied sciences - myllypuro campus. These sensors track room conditions (temperature, airflow rate, CO2 concentration, volatile organic compounds, barometric pressure) and people's presence (an optical camera). These data will be used to explore optimal automatic HVAC control for improving indoor air quality and analyze how different levels of air quality affect people's decision-making performance in the room. For instance, a high CO2 level can influence an individual's ability to concentrate. Participants will also be asked to complete app-based concentration tests.

Participants' rights: Participation in the study is voluntary. Participants have the right to discontinue participation at any time without obligation to disclose any specific reasons, all information gathered up until that point can be used in this study. Participants also have the right to: obtain information on the processing of personal data; access their own data; request rectification of their data; request restricting the processing of their data; right to ensure data is being processed for the purposes of scientific research.

Description of research tests: Participants will be guided to the laboratory at Metropolia University of Applied Sciences - Myllypuro Campus, where the experiments will be conducted. Within our facility, we have constructed a simulated room. There, participants will be invited to engage in work or any activity of their choice for a set duration of either 15, 30, or 60 minutes. As it is an enclosed room, the air quality might reach an uncommon level. But we will monitor the test and make sure anything is under control. All experiments are conducted in a safe environment and within a safe parameter range for health.

1. CO2 concentration will be limited under 1600 ppm.
2. The action limit for the toluene response of a single volatile organic compound in room air is $50\mu g/m3$.
3. The action limit for total VOC concentration in room air calculated by the toluene response is $400\mu g/m3$.
4. Room air temperature will be limited in + 18 °C to + 32 °C.
5. Airflow rate will be controlled between 5 l/s to 35 l/s.
6. The concentration of respirable particulate matter (PM 10) in indoor air during a 24-hour measurement shall not exceed $50\mu g/m3$.

7. The concentration of fine particulate matter (PM2.5) in indoor air during a 24-hour measurement shall not exceed $25\mu g/m3$.

8. The relative humidity is limited between 30% to 50%.

When any emergency happens, we will stop the test immediately. To evaluate the impact of the environment on cognitive performance, we will ask participants to complete an app-based concentration test both before and after their session in the room. Additionally, while not mandatory, participants are welcome to voluntarily provide demographic details such as their gender and age.

Funding source and compensation: This study is funded by Smart Building Doctoral School. Unfortunately, there is no compensation provided for participation in this study.

Contact details: Aalto University is the data controller in this research. Responsible researcher: Yinda Xu {yinda.xu@aalto.fi}.

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