Ethical Review ETHICS-000184

I Key Details

Study Name and Key Information

Non-medical study	✓
Status	Draft
Name of study	Optimal ventilation control for improving indoor air quality and analyze how different levels of air quality affect people
Study description	Using observed sensor data to explore optimal HVAC control for improving indoor air quality and analyze how different levels of air quality affect the people.
Type of study	Research project - Internal; Doctoral thesis to be produced
Funders	Smart building doctoral school
Reason for applying ethical review	Content of study (Finnish National Board on Research Integrity TENK guidelines); Expected publisher's/ journal's requirement
APL ID	
Diary number in SAHA	

General description of the research study in laypersons's terms

1. Detailed description	We have a simulate office room set up with lots of sensors. These sensors track room conditions (temperature, airflow rate, CO2 concentration, volatile organic compounds) and people's presence (an optical camera). We use this data to explore optimal automatic HVAC control for improving indoor air quality and analyze how different levels of air quality affect the people in the room. For instance, high CO2 level can influence an individual's ability to concentrate. A response testing application based on computers will be used.
2. Methodological expertise	The PI has several years of experience in smart building research. The other researchers have taken part in research and courses related to machine

	learning, control theory, and smart buildings.
3. Study duration	From February 2024 to the end of 2024.
4. Study locations	Metropolia university of applied sciences - Myllypuro campus

Researcher ID	Role	Position in Aalto	Employer/Work place	Special Role	Telephone	Email
R-000609	Principal Investigator	Professor of Practice				
R-000610	Coordinating Researcher	Employee				
R-000611	Participating Researcher (Aalto)					

III Participants

Study Participants

5. Describe study participants	Individuals of all genders, aged 18 and older, mainly university students.
6. Maximum number of study participants	30
7. Recruitment of study participants	None
8. Prescreening of participants	None
9. Compensation to participants	None
10. Participant informing	We will send emails to inform participants related information. There will be a poster on the wall outside the testing room to remind people.

IV STUDY DATA

Support for processing personal data

11. Need for support	I and/or my research team does NOT need support in processing personal data

Data types

12. Collected personal data	We will collect the gender and age of participants. Also People's ability to concentrate.
13. Personal data special categories	

V Risks

Study participants: Evaluation and mitigation of risks

14. Voluntariness of participation	Yes
15. Possible hidden factors	No
16. Awareness of being studied	Yes
17. Risks to study participants	As it is an enclosed room, the air quality might reach some uncommon level. Too high CO2 concentration level might cause participant feel a bit dizzy. Too high VOX and humidity might be harmful to participants as well.
18. Mitigation of risks to participants	We will monitor the situation, if anything reaches dangerous level, we will stop the test immediately. 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%.
19. Risks related to study process	No
20. Contacting the research staff	By email
21. Safety training and professionals	A researcher will be trained. Also he will be there in person to ensure the safety of experiments.
22. Contingency plans	Will organize escape if any emergency happens.
23. Process for unexpected incidents	None
24. Other ways for mitigating the risks	None

Researchers: Evaluation and mitigation of risks

25. Risks for researchers	None
26. Mitigation of risks to researchers	None

Society: Evaluation and mitigation of risks

27. Risks to society	None
28. Mitigation of risks to society	None

VI GDPR

Fill in

29. Justification of data collecting	We need to analyze how different air quality affects people's ability in concentration or productivity. So it is better to know people's age and gender.
30. Legal basis for personal data	Scientific research in the public interest
31. How is personal data minimised	We need to analyze how different air quality affects people's ability in concentration or productivity. So it is better to know people's age and gender.
32. Personal data storing and protection	It will be stored in a database based on a Linux server.
33. Access control and criteria	Only the researchers participating in the study will have access.
34. Data security responsible	The PI and alternatively Yinda Xu
35. Personal data sharing	No
36. Data disseminated in publications	No personal data will be shared. But the environmental data and presence data from sensors might be shared for peer review and publications.
37. Data retention period	The data will archived for possible future research. The archived data will be deleted 5 years after the last publication using the data.
38. Responsible for final archiving	The PI and alternatively Yinda Xu
39. Long-term risks of the study	All data will be stored locally. No long-term risks.
40. Long-term risks mitigation	None