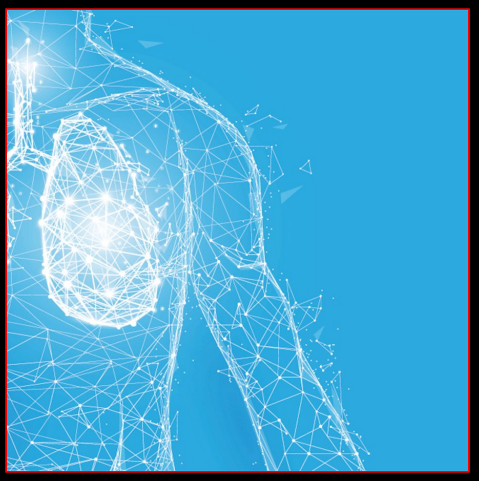
Air Quality

This project aims at developing an optimal ventilation strategy with regard to safety and well-being of crew members.



Laboratory:	**HOBEL**
Number of students:	**1 (Bachelor)**
Section:	**AR, GC, SIE**
Status:	**Available (Spring 2021)**

Description of the project

Air quality and thermal comfort is an important consideration not only for the external environments, but also for the indoor spaces where people spend the majority of their time. The indoor air quality and thermal comfort in enclosed spaces have been linked to human physical and emotional well-being. Spacecraft cabins, which can be approximated as extremely tight buildings, require special attention on air quality and thermal comfort because of their potentially adverse effects on crew members and on the entire mission. In the past, the National Aeronautics and Space Administration (NASA) has invested substantial effort in minimizing cabin air pollution and providing the crew with a comfortable environment. These approaches involve a combination of specific material selection and active control onboard the spacecraft. However, our knowledge remains limited in terms of what air pollutants the crew is typically exposed. Without knowing the type and concentration of particle and gaseous pollutants to which the crew is typically exposed, it is difficult to design adequate control actions that can prevent harmful health effects and ensure safe and comfortable spacecraft.

The specific project objective is to understand the level of indoor air quality and thermal comfort in a simulated spacecraft cabin occupied by human subjects. We will then use the results to propose an optimal ventilation strategy with regard to well-being and safety of crew members - all which can ultimately lead to improved health outcomes of crew members.

Description of the student's work and mission

- First few weeks, search for literature and understand the implication of air quality and thermal comfort on humans, and how to ensure it;
- Learn how to use the material and design how it will be integrated into the habitat;
- Imagine a survey that astronauts would have to take to link to the sensor's analysis;
- Develop a grid for analysing the survey responses and being able to link them to a cause;
- Interpretation of measures and results from the surveys;
- Analysis of results;
- Propose an optimal ventilation strategy with regard to well-being and safety of crew members.

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